

Appendices

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Appendix A

A.1 The lab: our field¹

The lab is located in Brussels. Along the years, the focus of the lab evolved from the dissection of tumor and post-ischemic angiogenesis towards the study of the determinants of tumor hypoxia and metabolism. Both basic and translational aspects are considered, the latter in direct collaboration with chemists, pharmaceuticals specialists and engineers from and foreign institutions.

Current research activities are related to the study of tumor hypoxia, from the dissection of the molecular determinants of this tumor microenvironment peculiarity to its impact on tumor metabolism and tumor biology incl. acidosis, ER stress, angiogenesis and response/resistance to treatment.

Research Topics

Current research activities are related to the study of tumor hypoxia, from the dissection of the molecular determinants of this tumor microenvironment peculiarity to its impact on tumor metabolism and tumor biology incl. acidosis, ER stress, angiogenesis and response/resistance to treatment.

Translational research encompasses the search for cancer biomarkers derived from the study of the serological proteome (auto-antibodies) and from the tumor cell transcriptome (prognostic signature), the management of a drug discovery platform to identify anti-tumor compounds issued from high throughput screening, hypotheses-driven neosynthesis of

¹ To protect the confidentiality of our participants, names and other identifiable data are encrypted; not real

chemicals or ethnopharmacology-selected plant extracts, and the development of tumor vascular-targeting nanoparticles to deliver therapeutic entities such as radio-isotopes and siRNA.

A.2 The lab members: our participants²

- 1. Paul / Principal Investigator**
- 2. Stephan / Post-doctoral fellow (2014-)**
- 3. Daniel / Post-doctoral fellow (2012-)**
- 4. Brian / Post-doctoral fellow (2011-)**
- 5. Dilara / Post-doctoral fellow (2014-)**
- 6. Gaelle / PhD Student (2011-)**
- 7. Cédric / PhD Student (2015-)**
- 8. Dalila / Technician (2007-)**
- 9. Marie / Technician (2009-)**
- 10. Joanne / MS student (2014-)**

² To protect the confidentiality of our participants, names and other identifiable data are encrypted; not real.

Appendix B

Interviews transcriptions

Case 1: Why 5% of co2 for cell culture?

B1. Individual interviews (case 1)**1. Why 5% of co2 for cell culture?**

1 **Stephan 1**

2 **[00:00:02] Why is your incubator regulated at the level of 5% co2 ?**

3 [00:08] why at 5% CO2? H::m that's a good one ((laughter)) (0.2) well the co2 by itself is I
4 think it's important for maintaining the correct pH in the medium (.) u:::h so it creates a
5 balance for the exchange of co2 to so that () in medium that changes the acidity otherwise
6 some culture medium that's been used (.) and (0.3) I'm thinking it's a value that is chosen (.) it
7 makes the conditions in such a way that the culture medium is maintained physiological (.)
8 pH which is normally around 7.4 something like that so that's why I guess but I don't (.) I'm
9 not like 100% sure that (.) but I guess that is the main (0.2) purpose [01:33]

10

11 **Brian 1**

12 **[00:00:01] ok good (0.3) Why is the incubator regulated at the level of 5% co2 ?**

13 ((eye contact and laughter from both sides))

14 [00:00:14] I think for different reasons (.) one thing could be to be a standard to have in every
15 lab in the world to have the same conditions (.) the other thing is that they found this is like
16 a compromise or average concentration of co2 in the body and the other reason is that
17 with this concentration of co2 there is the bicarbonate in the medium that u:::h (.) with this
18 concentration of CO2 it keeps the pH at 7 (.) These are my (.) I think the important (.) that's
19 why (.) [00:01:05]

20

21

22 **Daniel 1**

23 **[00:00:00] (0.3) so (.) ok (.) alors (.) why is the incubator regulated at the 5% co2 ?**

24 [00:00:07] c'est la norme qui a été fixée au niveau mondial notamment du au fait que pour le
25 besoin d'un certain taux d'acidité dans le milieu donc 5% de co2 combiné à la en fait avec la
26 concentration bicarbonate dans le milieu ça fait un pH qui est physiologique (.) un pH 7.4
27 (0.2) c'est pour ça que c'est 5% [00:00:43]

28



29 **Dilara 1**

30 **[00:00:03] why is the incubator regulated at the level of 5% co2 ? Les incubateurs**
31 **pourquoi elles sont (.) ils sont régulés à 5%?**

32 [00:00:16] u:::hh (.) ici je ne sais pas (.) forcément (.) je travaillais avec 10% de co2
33 ((laughter)) donc ((laughter)) (.)

34 **[00:00:24] ah**

35 [00:00:26] ben oui

36 **[00:00:27] tu travailles à 10%?**

37 [00:00:29] oui

38 **[00:00:30] ça théoriquement ou pratiquement?**

39 [00:00:31] non (.) pratiquement

40 **[00:00:32] où ça?**

41 [00:00:33] pour ma thèse

42 **[00:00:35] c'était 10%?**

43 [00:00:37] ah oui

44 **[00:00:38] eh ben c'est la première fois que j'entends une réponse comme ça**

45 [00:00:41] ah oui oui (.) c'est pour ça que [

46 **[00:00:43] [et pourquoi tu as décidé que c'était 10%?**

47 [00:00:44] J'ai pas décidé (.) c'est une culture qui a été mise en place par la fille qui a fait sa
48 thèse juste avant moi qui a récupéré ce protocole d'un autre labo (.) et donc voilà on avait
49 notre incubateur avec des cellules qui poussaient à 10% [

50 **[00:01:05] [et dans ce laboratoire là tous les autres incubateurs étaient à 5%?**

51 [00:01:10] uh c'était un cas un peu particulier parce que nous on a apporté la culture cellulaire
52 dans notre labo (.) parce qu'avant c'était un labo qui était principalement un labo analytique
53 (.) donc il ne faisait que des analyses (.) ils faisaient des analyses (.) ils faisaient des dosages
54 de différentes matrices (.) et nous est arrivés on a apporté la culture cellulaire dans le labo et
55 donc dans un premier temps il n'y avait que notre incubateur (.) il y avait que nous qui
56 faisions des cultures cellulaires (.)

57 **[00:01:40] donc il ya avait qu'un seul incubateur ?**

58 [00:01:41] On avait 2 (.) mais ((laughter)) oui

59 **[00:01:44] à 10?**

60 [00:01:44] à 10 (.) oui (.)

61 **[00:01:46] Et tu sais pas pourquoi le protocole faisait de sorte que [**

62 [00:01:49] [Non (.) parce que moi quand j'ai commencé (.) j'ai d'abord fait mon mémoire là
63 bas (.) et puis après j'ai enchaîné sur su ma thèse et pour moi les cultures cellulaires se
64 faisaient à 10% (.) et c'est après que (.) après quand j'ai été dans d'autres labos j'ai vu que les
65 autres se faisaient à 5% [

66 **[00:02:09] [à ce moment là tu pensais que la culture cellulaire se faisait à 10%?**

67 [00:02:13] mais je pense qu'il ya aussi (.) ça dépend de quelle culture on fait (.) parce qu'il ya
68 différents (.) en fait ici ils travaillent sur les lignées cellulaires (.) moi je travaillais sur des
69 cultures primaires (.) donc c'est déjà une différence (.) moi je travaillais sur les amibocytes (.)
70 en fin c'est des cellules c'est des cellules souches mais des cellules qui ne sont pas encore
71 différenciées que je prélevais que je mettais en culture et puis qui se différencient en

72 amibocytes (.) donc c'est une culture cellulaire qui n'a rien à voir avec ce qu'ils font ici (.) ici
73 ils font des lignées cellulaires c'est cellules qui sont standardisées quoi

74 **[00:02:43] Et pourquoi il arrive que tous les incubateurs sont à 5% ici?**

75 [00:02:49] une façon comme (.) je suppose de standardiser la recherche (.) n'ayant j'ai jamais
76 fait de (.) n'ayant jamais fait de 5% (.) je ne sais pas répondre (.) mais

77 **[00:02:58] pardon ?**

78 [00:03:00] n'ayant jamais travaillé à 5% (.)

79 **[00:03:03] toi?**

80 [00:03:03] oui

81 **[00:03:04] ah d'accord [00:03:06]**

82

83 **GAELE 1**

84 **[00:00:02] Why is the incubator regulated at 5% co2 ?**

85 [00:00:06] It's to regulate the pH in the medium of the cells

86 **[00:00:13] regulate?**

87 [00:00:14] the pH

88 **[00:00:15] the pH (.) in?**

89 [00:00:17] the medium (.) of the cells [00:00:24]

90

91 **Cédric 1**

92 **[00:00:02] Now it's um (.) You know the incubator is regulated at 5% co2 (.) why is it**
93 **regulated at the level of 5%?**

94 [00:00:03] It's for the cell culture (.) so it's like optimal condition you need for the cell to
95 grow

96 **[00:00:23] the optimal condition for what?**

97 [00:00:25] for the cell to grow

98 **[00:00:26] ah (.) but can you explain more (.) why is it optimal? What kind of a [**

99 [00:00:36] [because it's really linked to pH (.) the cell (.) I guess (.) I'm not always sure
100 about what I'm saying but at least I'm confident it's really it's really linked to pH of the
101 medium. The cell are growing (.) so if (.) if the pH change in the solution then the cell can
102 shift in metabolism or just die (.) so you don't know what will happen [00:01:09]

103

104 **PAUL 1**

105 **[00:00:01] Ok (.) uhm why is the incubator regulated at the level of 5% here (.) here and**
106 **and everywhere if you think (.) it's everywhere?**

107 [00:00:15] well the the the (.) the reason is that when you culture cells you need to (.) to
108 mimic the (.) the situation in vivo and (.) and contrary to (.) to the in vivo you do not have
109 blood to regulate everything and (.) and for instance there will be production of uhm(.) of uh
110 (.) acidity in in in the (.) uhm because of the metabolism of the cancer cells for instance (.) so
111 (.) any any cells (.) so if you don't have the blood to remove the protons (.) the acids (.) uhm
112 then you risk to increase the acidity in such a way that will not be compatible with cell
113 culture so co₂ is there to be in equilibrium with bicarbonate in the (.) in the culture medium
114 (.) in order to buffer the the medium so that we are sure that the medium is always around 7.4
115 (.) which is the physiological pH (.) uh and 5% co₂ is something which is easier to (.) to
116 control than if you were around 1% and it fits the concentration of bicarbonate you have in
117 the cells so there is an equilibrium between the co₂ in incubator and the bicarbonate in the
118 medium which offers you the right buffer system to have the cell culture culture at 7.4

119 **[00:01:46] Ok (.) but where did that practice start? Is it first in biology or in cardiology?**
120 **Where can I find information about where did this compromise start? Like a journal or**
121 **how did that start (.) or how was it decided that it should be 5%? [00:02:08]**

122 **[00:02:09]** I could not say (.) I could not say where you could find the information (.) I think
123 this is known for(.) uh (.) probably more than uh (.) 50 years ago(.) uh (.) more than ()
124 → (.)first people developed the medium that we use (.) uh they only wished to find the best
125 medium to get the cells in culture (.) so they they (.) they manipulate arbitrarily the the
126 medium the concentration of neutral amino acids and also pH through bicarbonate in order to
127 → to fit the the (.) so I've never been in contact with the original publication explaining why 5
128 instead of 10 or the (.) or 1(.)

129 **[00:03:02]** ok (.) because everyone told me that it's (.) it should be 5% and it's related to
130 the pH level (.) but Dilara for example said that she worked with 10% co2 (.) during her
131 PhD and she didn't even know that it should be 5% and when she travelled to the US
132 and started to work in another lab for (.) I don't know for(.) after her PhD (.) she was
133 told that it should be 5% and then she went to Paris she found it was 5% (.) she only
134 realized later (.) but how come that on the one hand we say that 5% is good to maintain
135 the pH level but on the other hand we can do it at 5 uh 10% (.) although you can even
136 notice the color of the medium that changes so how could that happen?

137 **[00:04:00]** I (.) I'm (.) I know that uh in the past they were (.) uh certainly (.) the 5% rule was
138 not that (.) uh present I know that you could read from publication much more before than
139 10% was also a possibility(.) why is that now 5% in the medium is also (.) also more uh (.)
140 ((noise outside and someone knocked on the door)) they are they are selling more companies
141 with (.) selling medium now and and (.) and the way these medium are now available with
142 strict concentration of everything (.) uh they are sold with an optimal of uh of uh of pH being
143 obtained with 5% co2 (.) so it's more commercial prescription from the medium and the 10%
144 may be historically able to have something which wasn't much more buffered and and
145 wanted to have something with a stronger buffering capacity (.) and they were with 10 but I
146 think that's the the the (.) the reason (.) for instance not to speak only about bicarbonate and

147 co2 (.) but the reason why people use high glucose uh or low glucose in their medium(.) at
148 the beginning it was because the kind of cells (.) use glucose so they consume glucose so the
149 day after you start the culture there would be less glucose the day after they will be at less
150 and so and so (.) so you need to start from a big level which is not necessarily the
151 physiological level in order to have always uh glucose available for the the the (.) and you
152 may also imagine after each day you increase the release of proton in the in the cell and that
153 more your buffer will be strong lesser you will have the shift in the acidity (.) the buffer is
154 trying to do his best to maintain the pH around 7.4 but we know that basically it would
155 anyway any way evolve seven three seven two and seven it's probably the limit and it's
156 enough to see the change in the color of the medium which is an additional (.) the layer of
157 control to to to see that (.) uh(.) but if you have not the bicarbonate after one day (.) you will
158 be (.) uh in quite bad shape of your cell culture (.) so yes 5% is is a norm which is uh dic (.) I
159 → would say dictated by the the (.) the current medium available commercially

160 **[00:07:00] dictated by the medium (.) because the medium available commercially needs**
161 **5%?**

162 **[00:07:01] Yes**

163 **Dalila 1**

164 **[00:00:02] why is the incubator regulated at the level of 5% co2 ?**

165 **[00:00:07] ((laughter))**

166 **[00:00:07] ((laughter)) Pourquoi est ce que l'incubateur ou les incubateurs ici sont à**
167 **5%?**

168 **[00:00:13] uhm pour le pH(.) je sais que (.) c'est un pourcentage généralement utilisé afin**
169 **de garantir uhm (.) que le milieu reste tamponné**

170 **[00:00:34] Qu'est ce que ça veut dire tamponné?**

171 **[00:00:35]**ça veut dire que lorsque tes cellules prolifèrent il faut pas que le milieu soit trop
172 acide parce que sinon tes cellules vont mourir (.)
173 **[00:00:45] donc tamponner c'est à dire stabiliser (.)**
174 **[00:00:46]** ça veut dire voilà ça évite les variations de pH
175 **[00:00:50] donc stabiliser**
176 **[00:00:51]** oui ça stabilise (.) ça évite les grands sauts de les grands sauts de pH (.) les
177 grandes variations
178 **[00:00:56](.) ok et pourquoi tu as rigolé quand j'ai dit (.) uhmm**
179 **[00:00:57] ((laughter))**
180 **[00:00:59] Pourquoi ça?**
181 **[00:01:00]** Parce que tout le monde m'a dit uhm
182 **[00:01:03] ((laughter))**
183 **[00:01:03] ((laughter))** et que du coup on a discuté entre nous et du coup on a découvert qu'il
184 ya des laboratoires qui travaillaient pas avec 5% de co2 (.) et du coup uhm qui ne travaillent
185 pas à 37 (.) et du coup on a peu tiqué un peu tous parce que on pensait que c'était
186 généralement utilisé
187 **[00:01:22] mais en fait non(.) mais on fait uhm je pense que tout le monde travaille sur**
188 **5% (.) il ya quelques uns(.)**
189 **[00:01:28]** oui pour des (.) Dilara oui par exemple
190 **[00:01:32]** oui et du coup on a tous regardé ah bon (.) parce que pour nous c'est (.) c'est les
191 conditions de base quoi(.)
192 **[00:01:39]et elle qu'est (.) comment elle a pris ça (.) Dilara ?**
193 **[00:01:44]** Ah mais non elle dit voilà c'était comme ça (.) maintenant (.) maintenant ici elle
194 manip pas donc uhm (.)
195 **[00:01:51] d'accord**

196 **[00:01:51]** elle l'a bien vécu ((laughter))

197 **[00:01:53]** quoi ?

198 **[00:01:55]** Je dis elle a bien vécu qu'on était tous étonnés

199 **[00:01:57]** Elle l'a bien vécu ?

200 **[00:01:57]** oui oui

201 **[00:01:59]** Elle n'a pas ça de [

202 **[00:02:02]** [Non

203 **[00:02:02]** = de mauvais coté ?

204 **[00:02:04]**(.) ah non

205

206 **MARIE 1**

207 **[00:00:07]** Why is the incubator regulated at the level of 5%?

208 [00:00:10] uhm (.) ça joue un rôle sur le pH (.) ça maintient le pH ça tamponne le
209 milieu dans lequel les cellules vivent [00:00:22]

210

211 **JOANNE 1**

212 **[00:00:03]** Why is the incubator regulated (.) regulated at the level of 5% co2 ?

213 [00:00:07] umh ((laughter)) THE question ((laughter)) (.) I don't know (.) I really don't
214 know [00:00:22]

215 **2. Have you heard this question before?**

216

217 **STEPHAN 2**

218 **[00:1:35]** ok (.) have you heard this question before?

219 [00:01:37] u::h a few times sometimes like from like a student or something like that or
220 somebody but u::h most of the time in daily practice normally not many people think about it

221 → (.) I know it's important because if co2 is not functioning like the culture become effective
222 (0.2) that's more like people know the necessity (.) but the exact role often they don't consider
223 into detail [00:02:25]

224

225 **BRIAN 2**

226 **[00:01:04] ok (.) have you heard this question before?**

227 [00:01:11] Yes (.) with you

228 **[00:01:12] no ((laughter)) I mean before me?**

229 [00:01:16] u::hmm (.) during my PhD we had a discussion like this but it was not exactly this
230 question but we were talking about [

231 **[00:01:26] [about what?**

232 [00:01:27] = co2 and this (.) co2 and the regulation of PH and the medium (.)so it was
233 important to keep the pH at 7.4

234

235 **DANIEL 2**

236 **[00:00:40] (.) Concentration (.) 5% (.) d'accord (.) Have you heard this question before?**

237 [00:00:46] No.

238

239 **DILARA 2**

240 **[00:03:05] Have you heard this question before? Est ce que tu as entendu cette question**
241 **avant? Pourquoi on met l'incubateur à tel niveau?**

242 → [00:03:14] u::h (.) oui (.) parce que quand j'ai travaillé aux états unis eux ils étaient à 5%
243 aussi

244 **[00:03:21] uh**

245 [00:03:21] et donc (.) c'est là que je me suis rendu compte que c'était bizarre que j'ai travaillé
246 à 10% ((laughter)) et j'avais posé la question aussi et (.) parce qu'on a toujours fait

247 **[00:03:31] Et qu'est ce qu'ils disaient?**

248 [00:03:33] parce qu'on a toujours fait

249 **[00:03:35] C'est ce qu'ils disaient?**

250 [00:03:36] oui

251 [00:03:38] C'est souvent la réponse des gens quand ils savent pas (.) Ils emploient l'argument
252 historique ((laughter)) (.) on a toujours fait comme ça (.) ((laughter)) c'est pas une raison

253

254 **GAELE 2**

255 **[00:00:22] ok (.) that's the reason (.) Have you hear this question before?**

256 [00:00:27] Yeah (.)

257 **[00:00:28] Where?**

258 [00:00:33] In the lab ((laughter))

259 **[00:00:33] How long?**

260 [00:00:34] It was a student

261 **[00:00:38] A student said that**

262 [00:00:38] I ask also the question it was (.) that's the answer that I received ((laughter))

263 **[00:00:47] When (.) approximately (.) when was that?**

264 [00:00:51] When I asked the question?

265 **[00:00:51] Yeah or the other student asked?**

266 [00:00:53] When you arrived in the lab and we have to begin to make the culture

267 **[00:00:58] when I arrived?**

268 **[00:00:58] Ah NO NO NO (.) When I arrived in the lab**

269 **[00:01:03] Ok (.) so it was 4 years ago (.) you asked the question**

270 [00:01:08] Yeah

271 [00:01:08] and the other student (.) when they arrived also

272 **[00:01:12] When was that?**

273 [00:01:13] When the student becomes to make their "stage".

274 [00:01:22] training?

275 **[00:01:22] Training**

276 **[00:01:22] Who the other student? Yassine?**

277 [00:01:26] For me it was Laurie

278 **[00:01:29] uhuh**

279 [00:01:30] The technician

280 **[00:01:31] huhum**

281 [00:01:31] mostly when the people are new in the lab (.) and they begin to [

282 **[00:01:37] [ok**

283 [00:01:39] = to make culture

284 **[00:01:39] and that's usually how you ask questions? And did you hear me asking the**

285 **question to your colleagues before? Have you heard me like around asking the**

286 **question?**

287 [00:01:51] uh asking question about?

288 **[00:01:54] This question to other people**

289 [00:01:55] no

290 **[00:01:56] No? ok**

291 **CÉDRIC 2**

292 **[00:01:12] ok (.) have you heard this question before?**

293 [00:01:15] no (.) I mean (.) yeah I mean I'm not sure (.) I've never thought about it

294 **[00:01:27] sorry?**

295 → [00:01:28] I've never thought about it (.) it's just (.) it's the way it is the best way so

296

297 **PAUL 2**

298 [00:07:02] that one in particular (.) ok (.) now have you heard this question before? The

299 question of why 5%?

300 [00:07:10] No (.) the question is usually from the students why co2

301 [00:07:17] ah they say why co2 (.) but not necessarily why 5%?

302 ↘ [00:07:25] Yeah because in the air (.) we have uh (.) we have limited amount (.) much

303 limited amount of co2 (.) which is (.) the 5% co2 does not reflect the co2 in the atmosphere

304 [00:07:40] ok (.) we will come to that may be in the body it's different

305

306 **DALILA 2**

307 [00:02:06] D'accord (.) Have you heard this question before? Est ce que tu as entendu

308 cette question avant?

309 [00:02:12] oui

310 [00:02:14] où ça ?

311 → [00:02:14] ici avec les autres

312 [00:02:15] c'était quand ces derniers temps ?

313 → [00:02:18] oui parce que tu l'as posé

314 [00:02:19] ah donc après que je l'ai posé ?

315 [00:02:22] oui

316 [00:02:22] et comment les gens ont pris cette question débile ((laughter)) ?

317 → [00:02:29] qu'est ce qu'il veut avec son 5% co2 ?

318 [00:02:33] ((laughter)) d'accord

319 **[00:02:38]** Et tout le monde se dit et ben quand même c'est comme ça... chez vous c'est
320 comme ça ? ben oui chez nous c'est comme ça (.) et puis voilà (.)

321 **[00:02:41]** d'accord

322 **[00:02:42]** Jusqu'à ce que Dilara nous dit 5 (.) ben chez nous c'est pas comme ça (.)

323

324 **MARIE 2**

325 **[00:00:23]** D'accord (.) and have you heard this question before?

326 **[00:00:27]** Non (.) pas vraJoannet (.) non (.) mais je savais que le pH devait être maintenu et
327 que il ya avait certaines choses dans le milieu qui faisait que voilà c'était maintenu mais pas
328 directement le lien avec 5% de co2

329 **[00:00:46]** oui (.) but before I asked the question (.) did you hear me asking this question
330 the other day?

331 **[00:00:50]** yeah

332 **[00:00:53]** You heard me right? And it was the first time?

333 **[00:00:55]** yes ((laughter))

334 **[00:00:55]** ((laughter)) ok (.) this is important to mention (.)

335

336 **JOANNE 2**

337 **[00:00:24]** Ok (.) have you heard this question before?

338 **[00:00:26]** From you yes

339 **[00:00:28]** Not from me (.) from another person

340 **[00:00:30]** No

341 **[00:00:31]** It was the first time to hear to hear it from me?

342 **[00:00:33]** Yes

343

344 **3. Do you think that this question has been trivialized or neglected?**

345

346 **STEPHAN 3**

347 **[00:2:29] ok do you think that this question has been trivialized or neglected?**

348 [00:02:35] umh (.) I think. I don't know if it's trivialized or neglected (.) it's just something

349 that's ignored (.) it's that people take things for granted (.) settings (.) machines they just plug

350 it and play and they follow the instructions that level they just go with it and often with such

351 issues people they don't really think about what is the role what is the actual mechanism (.)

352 why it has to be like that

353 **[00:3:19] why (.) why is it ignored?**

354 [00:3:23] well it's like standards so you have to put it there (.) so you don't want to: (.) people

355 don't want to I think to waste their energy by spending and thinking on something as this

356 because it's (.) It's not the key issue that they want to address at the moment (.) it's just not

357 one of the parameters that is required. It's some standards I think (.) It's always like that so

358 why would you change it. And if they don't change it (.) they don't have to think about it

359

360 **BRIAN 3**

361 **[00:01:44] ok (.) do you think that this question has been trivialized or neglected?**

362 [00:01:51] may be now yes (.) because it's a it's a long time it was set up and we don't

363 question these things (.) but I think in the past they were discussing a lot a lot

364 **[00:02:10] ok (.) why it's not considered nowadays or neglected (.) if you think so?**

365 [00:02:23] No the only thing is just so these like a standard that is well established

366 everywhere and in every lab you have always this set up

367 **[00:02:44] say it again please**

368 → [00:02:45] you think that not all the people is wrong and they are just in the wrong (.) co2
369 concentration

370 **((interruption by another person who entered the room))**

371 [00:03:17] uhhh (.) can you say it again please (.) why this question has not been dealt
372 with or discussed or not discussed anymore if you think so?

373 [00:03:26] because it's established since a long time and it's in everywhere it's you will find
374 the same set up and I think yeah

375

376 **DANIEL 3**

377 [00:00:50] uh do you think that this question has been trivialized or neglected?

378 [00:00:56] J'ai pas compris

379 [00:01:00] La question a été trivialisée (.) marginalisée?

380 [00:01:03] oui (.) oui (.) oui parce que d'une part en fin d'une part je me suis posé plein de
381 questions pourquoi 5%? et je pense qu'il ya des gens qui viennent au laboratoire et je pense
382 qu'il n'y en a pas beaucoup qui savent répondre

383 [00:01:27] **((interruption by someone else talking to another person))**

384 [00:01:40] and why it was neglected? Why it was not considered?

385 [00:01:43] Je pense c'est (.) c'est vraJoannet des conditions standards que (.) voilà pour les
386 gens c'est un incubateur à 37 degrés 5% de co2 (.) voilà c'est des conditions que tout le
387 monde utilise (.) voilà (.) il ya plus de remise en question entre guillemets de ces conditions
388 (.) c'est accepté partout

389

390 **DILARA 3**

391 [00:03:55] Ok (.) do you think that this question has been trivialized or neglected? tu
392 penses que [

393 [00:04:00] [u::hm je pense qu'elle est importante parce que c'est une façon de mettre le doigt
394 sur le fait qu'on maîtrise pas tous les paramètres de la recherche (.) c'est quelque chose de
395 trivial (.) tout le monde travaille à 5% et tout le monde fait ça (.) en fin dans ce cas ci (.) mais
396 finalement j'ai l'impression que peut être peu de gens savent pourquoi on travaille à 5% de
397 co2

398 **[00:04:26] Et pourquoi?**

399 [00:04:28] Parce que ça n'a peut être pas beaucoup d'impact (.) parce que finalement c'est pas
400 un paramètre qu'ils vont étudier pendant leurs recherches (.) et donc ça a un peu d'importance
401 (.) c'est comme finalement le temps qu'il fait dehors ça une influence aussi sur les cellules qui
402 poussent dans les incubateurs (.) ben c'est pas plus que ça.

403

404 **GAELE 3**

405 **[00:01:59] Do you think that this question has been trivialized or neglected?**

406 [00:02:07] When u::hm somebody (.) in general?

407 **[00:02:10] in general (.) do you think that it is to maintain pH and or people**

408 [00:02:16] Yes we could uhm a(h)h "approfondir"

409 **[00:02:23] dig down**

410 [00:02:33] deep?

411 **[00:02:33] or making deeper?**

412 [00:02:33] yeah to be more precise

413 **[00:02:37] Precise (.) why?**

414 [00:02:38] because we can't say ok (.) to regulate the pH (.) but how it works (.)

415 **CÉDRIC 3**

416 **[00:01:35] ok (.) do you think that this question has been trivialized or neglected?**

417 [00:01:42] yeah may be I don't know (.) for my part yeah (.) I never asked myself that
418 question about the 5% (.)

419 **[00:01:59] Why (.) why such a question is neglected or you don't ask yourself or for**
420 **other people may be don't ask this question although it's a central factor in the (.)**
421 **everything goes through the incubator in any research (.) so would that be?**

422 [00:02:14] because (.) for one thing (.) you know it has already been optimized (.) so you
423 know that's the best condition for sure and you're not going to change anything about that (.)
424 but yes (.) it's good to know why it's like that I guess

425

426 **PAUL 3**

427 **[00:07:42] do you think that this question has been trivialized or neglected or may be**
428 **there is a need now to go back and see what kind of consequences that might happen if**
429 **5% turns out to be not the most appropriate for the (.) to mimic the cells in the body?**

430 [00:08:04] well it's (.) it's part of the core business of our research to consider that
431 specifically in the field of cancer (.) uh a tumor(.) in (.) a tumor pH is usually measured
432 below 7 and it's usually between 6.5 and 7 so the culturing cancer cells at a pH which is
433 buffered (.) which at 7.4 like in many labs you you you (.) you probably lose part of the part
434 of the of the of the information (.) so it is clearly uh uh underappreciated (.) and this is why
435 we have shifted the way we we do we regulate the pH in our cells using all the kind of buffers
436 not dependent on co2 which allows to uh to fix the pH at 6.5 and to have cells(.) tumor cells
437 growing in the environment which is normally the environment in vivo

438

439

440 **DALILA 3**

441 **[00:02:46] oui (.) Et euh (.) do you think that this question has been trivialized or**
442 **neglected? Tu penses que cette question a été euh (.) personne ne l'a posé avant? Elle a**
443 **été marginalisée ou personne ne s'arrête dessus ?**

444 **[00:02:59] oui je pense qu'on ne s'arrête pas dessus**

445 **[00:03:05] et Pourquoi ?**

446 **[00:03:05] Pourquoi c'est (.) je pense qu'il ya des choses comme ça (.) on arrive dans un**
447 **labo(.) on nous dit voilà on cultive les cellules 5% 37° et puis c'est comme ça (.) on va pas**
448 **s'arrêter sur ce détail là (.) après tu (.) on va:: dans le cadre de tes études oui va t'expliquer**
449 **que c'est comme ça quand tu vas préparer un mémoire où tu dois savoir chaque étape à quoi**
450 **ça sert (.) bien oui tu vas poser la question pour savoir pourquoi mais c'est (.) tu passes au**
451 **dessus (.) et après c'est comme ça (.) et puis c'est tout**

452

453 **MARIE 3**

454 **[00:00:55] ((laughter)) ok (.) this is important to mention (.) ok (.) do you think that this**
455 **question has been trivialized or neglected?**

456 **[00:01:05] uhm (.) je pense pas que ça était négligé mais on se la pose pas tous les jours (.)**
457 **quoi (.) puisque c'est comme ça (.) l'incubateur on nous (.) enfin (.) on nous le vent comme**
458 **ça (.) tous les incubateurs normalement sont à 5% de co2 (.) donc (.) voilà (.) je pense pas**
459 **que c'est négligé mais c'est comme ça quoi (.) il ya tellement de choses**

460

461 **JOANNE 3**

462 **[00:00:34] ok (.) ok do you think that this question has been trivialized or neglected?**

463 **[00:00:39] uhm (.) You mean by me?**

464 **[00:00:44] ok (.) by you**

465 [00:00:45] No (.) I didn't think about it most of the time

466 **[00:00:50] You said what?**

467 [00:00:51] I think about the question like is it

468 **[00:00:55] No (.) no before I asked you this question**

469 [00:00:57] I didn't ask myself that question

470 **[00:00:59] So (.) it was neglected (.) by you?**

471 [00:01:02] Yes

472 **[00:01:03] ok (.) or let's say you didn't pay attention to it (.) but what about others in**
473 **your opinion?**

474 [00:01:10] I don't know (.) I've never asked them that or I've never hear about this from them
475 (.) so I don't know

476 **[00:01:23] ok (.) why (.) why is this question for example uhm (.) in your opinion why**
477 **this question has never come up to the surface? You never see (.) saw someone talk**
478 **about it?**

479 [00:01:33] I don't know (.) we took it like uhm how to say this one?

480 **[00:01:46] For granted?**

481 [00:01:46] For granted (.) in the class they say ok you keep cells at 37° plus 5% co2 (.) that's
482 it (.) for all the cells it's like that so (.) I don't know why (.) even in the body I don't think it's
483 the same thing (.) like in the body (.) there is (.) differences between

484 **[00:02:12] Fluctuation?**

485 [00:02:12] Yes (.)

486 **[00:02:16] Between?**

487 [00:02:16] like between the amount of oxygen and co2

488

489 **4. Do other biology labs in Belgium & elsewhere also regulate their incubators at 5%**
490 **co2 ?**

491

492 **STEPHAN 4**

493 **[00:4: 14] Do other biology labs in Belgium or elsewhere also regulate their incubators**
494 **at 5% co2 ?**

495 [00:4:20] U::h yeah yeah all the labs where I worked were programmed at the same level (.)
496 the same concentrations

497

498 **BRIAN 4**

499 **[00:03:36] ok do other biology labs also regulate their incubators at 5%?**

500 [00:03:45] yeah yeah in Germany in Spain in all the labs like this they make the same co2
501 concentration

502

503 **DANIEL 4**

504 **[00:02:19] Bon (.) Do other biology labs in Belgium or elsewhere also regulate their**
505 **incubators at 5% co2 ?**

506 [00:02:25] oui tous

507 **[00:02:28] Dans le monde aussi?**

508 [00:02:33] oui

509 **[00:02:37] même dans tous (.) dans tout laboratoire de biologie (.) vous vous attendez à**
510 **ça?**

511 [00:02:40] oui oui

512 **[00:02:40] ah d'accord**

513 [00:02:43] oui parce que de toutes façons les firmes qui vendent les incubateurs (.) voilà de
514 co2 (.) on peut le changer (.) mais il est placé à 5% par défaut (.) ce qui fait que u::hm voilà
515 on peut critiquer ou non pourquoi c'était placé à 5% (.) mais maintenant on sait que sinon fait
516 la culture ici on la place dans un autre labo aux états unis c'est les mêmes conditions donc (.)
517 on peut comparer (.) u::h les résultats qu'on a dans nos conditions que dans les conditions
518 d'un autre labo c'est (.) c'est standardisée donc ça évite des biais qui sont du juste aux
519 conditions de culture

520

521 **DILARA 4**

522 **[00:04:51] Do other biology labs in Belgium or elsewhere regulate their incubators at**
523 **5%?**

524 [00:04:59] Il ya le (.) aux états unis (.) ils étaient à 5% (.) ici c'est à 5% (.) et u::hm (.) où est
525 ce que j'étais encore? La culture cellulaire? à Paris

526 **[00:05:16] C'était 5%?**

527 [00:05:17] 5% aussi

528 **[00:05:23] Je te dis une chose (.) d'après toutes les réponses de tes collègues (.) ils sont**
529 **tous d'accord que c'est toujours 5% à moins que tu veux vraJoannet travailler sur ça (.)**
530 **mais généralement tout le monde est utilise 5% qu'est ce que tu en penses?**

531 [00:05:36] Oui (.) je pense que c'est (.) c'est un peu (.) c'est un peu comment dire? C'est très
532 compliqué en fait de dire tout le monde travaille sur 5% alors qu'on a jamais rencontré tout le
533 monde parce que eux ici ils travaillent sur des lignées cellulaires et les lignées cellulaires c'est
534 les cellules qui ont des formes bien définies alors que finalement les cultures primaires
535 demandent des paramètres beaucoup plus fins elles sont vraJoannet capricieuses (.) c'est des
536 cellules très capricieuses donc du coup il faut régler les différents paramètres pour arriver à
537 avoir des cellules qui poussent correctement

538

539 **GAELE 4**

540 **[00:02:55] ok (.) do other biology labs in Belgium or elsewhere regulate their incubators**

541 **at 5%co2 ?**

542 **[00:03:01] Yeah (.) I hope ((laughter))**

543

544 **CÉDRIC 4**

545 **[00:02:41] Do other biology labs in Belgium and elsewhere also regulate their**

546 **incubators at 5%?**

547 **[00:02:47] I guess everyone do that (.) except if you want to raise an issue and you are going**

548 **to change this**

549

550 **PAUL 4**

551 **[00:09:10] uh (.) so do other labs in Belgium and elsewhere also regulate their**

552 **incubators at 5% ?**

553 **[00:09:17] Yes**

554

555 **DALILA 4**

556 **[00:03:38] ok (.) do other biology labs in Belgium and elsewhere also regulate their**

557 **incubators at 5% ? donc les autres laboratories**

558 **[00:03:42] oui**

559 **[00:03:43] oui ?**

560

561

562 **MARIE 4**

563 **[00:01:32] ok (.) do other biology labs in Belgium and elsewhere also regulated their**
564 **incubators at 5%?**

565 [00:01:38] Yes

566

567 **JOANNE 4**

568 **[00:02:19] Ok (.) we will come to that (.) but now for now (.) do other biology labs in**
569 **Belgium or elsewhere also regulated their incubators at 5%?**

570 [00:02:29] I think yes (.) but I didn't have the experience (.) like the chance to see that so (.)
571 it's my first lab (.) my first time here (.) so (.) my first experience here (.) so I don't know (.)
572 but when we get the courses (.) lessons (.) the professors also always tells like in the
573 practicals that we have to put cells in the 37° plus 5% co2

574 **[00:03:02] They always say that (.) in the courses?**

575 [00:03:03] yes (.) well (.) for the courses I get (.) I got (.) yes (.) maybe there is some labs
576 who work in different conditions (.)

577 **[00:03:26] ok**

578 [00:03:27] Like for example (.) here if you work here in Hypoxia (.) you need to put cells at
579 like no oxygen at all

580 **[00:03:38] that's not in the incubator (.) that's in the other machine (.) right?**

581 [00:03:41] yes

582

583 **5. Do you think that this question is important for your research?**

584

585 **STEPHAN 5**

586 **[00:4:39] Do you think that this question is important for your research?**

587 [00:4:42] I think it can really affects because u::hm it's (.) what you're doing is like
588 generalizing a condition (.) but may be depending on your study subject you might actually
589 need a different condition (.) so may be the 5% is in general a good setting for most purposes
590 (.) but in your own research it might be required to be different.

591 **[00:5:22] So (.) ok (.) next question why (.) why is it important? Or may be you**
592 **answered already (.)**

593 [00:5:28] Yeah I guess so (.) it's an important parameter (.) everything that you're doing is (.)
594 All your culture cells that you put in the incubator are affected by the parameters that are set
595 (.) and may be your cells are (.) requiring something different (.)

596

597 **BRIAN 5**

598 **[00:03:53] ok (.) do you think that this question is important for research today?**

599 [00:03:57] could be (.) it depends on the topic you want to work on if you are interested to
600 check the acidity or the medium or some some process that is regulated by the co2 levels in
601 the body yeah could be an interesting thing (.) yeah sure

602 **[00:04:20] why (.) or maybe you mentioned (.) but I have to ask you why again**
603 **((laughter))**

604 [00:04:29] why (.) there is some (.)some research that involves the changes in pH in the body
605 or acidity or (.) I think this could be interesting to modify the co2 concentration.

606

607

608 **DANIEL 5**

609 **[00:03:33] d'accord justement ça va venir après sur le biais (.) est ce que c'est une**
610 **condition ou facteur qui peut biaiser aussi la recherche ça c'est une question qu'on va (.)**
611 **mais maintenant (.) Do you think that this question is important? Est ce que c'est une**
612 **question à considérer dans ta recherche?**

613 [00:03:51] oui c'est en fin (.) je pense que c'est quand même important de savoir pourquoi on
614 place à 5% (.) uhm donc la discussion après uhmm de toutes façons là on ne changera pas
615 notre façon de faire la culture (.) voilà c'est placé à 5% on sait pourquoi tout le monde utilise
616 un pH à 7.4 pour les cultures sauf (.) des conditions particulières (.) oui ça c'est bien de (.)

617 **[00:04:34] C'est important dans le sens c'est bien de le savoir**

618 [00:04:37] oui

619 **[00:04:38] Je veux dire (.) est ce que il est important de se réinterroger sur le (.) les**
620 **conséquences qu'il peut y avoir (.) u:::h (.) on va parler de ça plus tard (.) en fait ça me**
621 **pousse directement à la prochaine question est ce que dans le corps humain il n'ya**
622 **pas nécessairement 5% dans tous les organes donc toutes les cellules n'ont pas 5%**

623 [00:05:05] non mais c'est des conditions artificielles qui font qu'on va atteindre un pH 7.4 qui
624 est le pH physiologique qu'on trouve dans le (.) en fait c'est un (.) on voit ça en terme de
625 concentration co2 (.)

626 **[00:05:20] oui**

627 [00:05:21] et la conséquence de ça c'est le fait d'atteindre un pH dans le milieu qui est un pH
628 physiologique

629 **[00:05:31] est ce qu'il ya d'autres conditions qui sont (.) pour le pH oui tu peux atteindre**
630 **le pH**

631 [00:05:37] oui

632 **[00:05:37] mais il peut y avoir d'autre side effects comme on dit**

633 [00:05:43] oui après uhohm en c'est soi pareil on travail (.) on un une atmosphère qui est
634 humide (.) on un un bac d'eau dans dans notre incubateur là aussi on peut dire mais c'est
635 pas forcément se qui se passe réellement dans le corps.

636

637 **DILARA 5**

638 **[00:06:24] D'accord (.) do you think that this question is important for research for**
639 **your research for example? De se demander pourquoi 5% pourquoi 10%? ou pourquoi**
640 **tel taux?**

641 [00:06:36] u::h je pense que dans la vie de tous les jours c'est pas important parce que
642 comme tu l'as dit finalement la majorité des gens font comme ça (.) donc on se pose pas
643 question (.) mais par contre je crois que c'est important de se poser une fois la question

644 **[00:06:57] Pourquoi?**

645 [00:06:58] Pour prendre conscience que finalement (.) en fin (.) du moins dans le cas (.) que
646 finalement c'est vrai qu'on fait des choses par habitude mais on sait pas forcément pourquoi
647 on le fait.

648

649 **GAELLE 5**

650 **[00:03:07] ((Laughter)) (.) do you think that this question is important for your**
651 **research?**

652 [00:03:18] To know the answer or to do this or to have the question?

653 **[00:03:20] Does it have consequences on your research (.) if it turns out that 5% is not**

654 [00:03:29] only this question or

655 **[00:03:29] Yeah this question (.) is it important for the result of your own research**

656 [00:03:39] To be (.) the question or the incubator at 5%?

657 **[00:03:40] the incubator at 5%**

658 [00:03:42] Yes it's important because otherwise the cells can may be not (.) are not in the
659 right condition so it can have different consequences on our research (.) research

660 **[00:04:01] can you explain more (.) why is it important?**

661 [00:04:06] because in our body the pH is at 7.4 and it has to be around this pH and when you
662 culture your cells the pH has to be buffered and to stay around 7.4 to be quiet in the same
663 condition as in the body (.) and otherwise may be they can have different comportment
664 "comportement"? behavior

665

666 **CÉDRIC 5**

667 **[00:03:04] Do you think that this question is important for research?**

668 [00:03:08] what do you mean by?

669 **[00:03:09] the question of (.) asking why why 5%? Why not more or less? of knowing**
670 **why**

671 [00:03:18] Of knowing why yes it's important to know what (.) why you're doing this stuff (.)
672 uh (.)Yeah

673 **[00:03:28] Why is it important to know?**

674 [00:03:32] Because (.) I mean you can (.) you could cultivate cell for years and don't know
675 why you need that (.) but then if one day it just shut down again you lose your co2 you don't
676 know what it's doing (.) then you don't know the importance of having it and you don't know
677 (.) I mean if you can cultivate your cells without it for a short time or is it important or
678 whosoever

679 **[00:04:00] ok (.) so for you it's important to know why or to question again why not (.)**
680 **why not try another thing or you think we should never (.) we should not try another**

681 [00:04:18] No (.) I guess I guess for that it's not worth questioning because I guess for a long
682 time cells have been cultivated for sure the best way to cultivate them but it's good to know
683 why but for the thing you have to question it to try a new thing (.) you know what I mean?

684 **[00:04:43] I need to understand 100% (.) you said it's important to know why (.) but**
685 **there is no need to question it again (.) because some their people did the research**
686 **before and they found the results**

687 [00:04:54] yeah yeah yeah

688 **[00:04:58] but if the result turns out to be (.) their result (.) turns out to be really not**
689 **helping the research**

690 [00:05:07] Yeah but (.) I guess (.) I've never looked into why the 5%(.) or(.) I said just that
691 but it's you know it's (.) I guess it's established for really long time you know (.) it should
692 have been done and redone (.) a lot of time (.) by now (.) so I guess it's ok

693

694 **PAUL 5**

695 **[00:09:20] ok do you think that this question is important for research(.) to reconsider**
696 **this 5%? Although it's important for the for the acidity for the pH level but to**
697 **reconsider other consequences?**

698 **[00:09:40] No**

699 **[00:09:46] It doesn't worth reconsidering it (.) uh (.) ok.**

700 **[00:09:47] It worths to reconsider the the (.) the the the pH which sets our culture (.) clearly**
701 **(.) but we know that it's not by changing the co2 concentration that we'll have the (.) it will**
702 **reach the (.) for instance the cancer cells the expected pH mimicking the in vivo condition (.)**
703 **so yes it's important to consider the pH (.) uh but not from the co2 (.) through other means of**
704 **regulating ph**

705

706

707 **DALILA 5**

708 **[00:03:43] ok now do you think that this question is important for research? Tu penses**
709 **que ce ce don ce donn cette donnée là elle est importante pour la recherche (.) 5% (.) si**
710 **on se pose pas la question (.) si on fait 10 (.) 15 (.) 2 (.) 3**

711 **[00:04:07] ah ben je pense que ça modifie les données oui.**

712 **[00:04:08] ça ?**

713 **[00:04:09] ça modifie les données**

714 **[00:04:12] d'accord (.) ça(.) donc tu penses que c'est important de de**

715 **[00:04:14] oui ben oui oui ben tous les paramètres sont importants si on modifie ce paramètre**
716 **là (.) on aura pas peut être les mêmes euh les mêmes résultats ...**

717 **[00:04:27] uhm**

718 **[00:04:27] je n'ai aucune idée (.) je ne sais pas si dans les papiers ils précisent que**
719 **l'incubateur est à 5% (.) ça je ne sais pas (.) ça modifie oui**

720 **[00:04:39] et pourquoi ça modifie dans quel sens ? où exactement ?**

721 **[00:04:39] parce que (.) attends si ça joue avec le bicarbonate qu'on a dans le milieu après si**
722 **tu mets 15% (.) donc euh ton milieu n'est pas tamponné pareil alors [**

723 **[00:04:53] [donc ça par rapport au pH toujours**

724 **[00:04:54] toujours**

725 **[00:04:54] oui(.) voilà (.) oui ici on étudie les cellules à pH acide avec les cellules à pH**
726 **classique donc on voit bien que la modification complètement du métabolisme de la cellule**
727 **donc je suppose que si tu te retrouve à 15% de co2 si ton pH n'est le même n'est plus**
728 **maintenu pareil automatiquement il ya [**

729 **[00:04:20] et [après le pH qu'est ce que ça peut changer dans la... qu'est ce que...**

730 **[00:04:23] ça peut changer le métabolisme au niveau à mon avis la fiabilité de la cellule et la**
731 **manière dont elle euh dont elle prolifère et tout**

732

733 **MARIE 5**

734 **[00:01:39] ok (.) do you think that this question is important for research?**

735 [00:01:47] I think yes (.)

736 **[00:01:52] why? why is it important to**

737 [00:01:55] Because (.) it's a par a parameter like another parameter (.) like I don't know the

738 glucose in the medium or something like this or the temperature of the culture or something

739 (.) yes

740 **[00:02:10] [00:02:11] Is it like or even more important (.) because it's a central**

741 **parameter and every single research goes through it?**

742 [00:02:19] Yes (.) I think it's important yes because the cells is all the time in the incubator so

743 (.) like you said the first piece important (.)

744 **[00:02:36] piece?**

745 [00:02:36] Yeah

746 **[00:02:37] and (.) but why? Why is it neglected I mean can to (.) can you think really**

747 **and seriously why such an important thing can be neglected by everyone? Every**

748 **where?**

749 [00:02:47] No (.) I think it's not négligé

750 **[00:02:52] Oui oui tu peux parler en**

751 [00:02:53] négligé

752 **[00:02:54] neglected (.) tu peux tu peux en français**

753 [00:02:59] Je pense que (.) non c'est pas négligé mais c'est que ça fait partie des choses qui

754 sont comme ça tu vois (.) on a du mettre certains paramètres on a du les normaliser (.) on a du

755 les normaliser avant et puis une fois qu'ils ont été normalisés ces paramètres ont été fixés

756 partout pareil (.)

757 **[00:03:17] uhm (.) même si il ya des nouvelles recherches et que toutes ces recherches**
758 **quelques soient leurs objectifs passent quand même par ce paramètre?**

759 [00:03:25] oui (.) je pense que (.) oui voilà

760

761

762 **JOANNE 5**

763 **[00:03:43] Now (.) do you think that this question is important for your research? Or**
764 **your future research?**

765 [00:03:50] Yes (.) I think it's important (.) because we have to consider uhm how the cells
766 and in which the cells (.) in which conditions they are living in reality like in the body and to
767 try to incubate them in the right condition (.) but I don't know if it is possible because
768 incubators need money and if you are doing experJoannets for different types of cells so you
769 need many incubators (.) we need lot of budget for that

770 **[00:04:48] So (.) why it's important for consider (.) in terms of (.) regardless of money (.)**
771 **why is it important to think about this question or take into consideration all the time?**

772 [00:05:02] To make the condition as near as possible to the reality (.) so that what we can say
773 or the effect we see it is near to normal (.) to reality

774

775 **6. Is 5% of co2 the same condition in the human body?**

776

777 **STEPHAN 6**

778 **[00:5:50] Ok (.) is 5% of co2 the same condition in the human body?**

779 [00:5:55] u:::hmmm no I don't think it's like the same condition (.) but it's some like physical
780 equilibrium that is reached by setting this percentage in the incubator that the (.) down the
781 medium it becomes like a physiological settings (.) so it's like (.) it's not necessarily the(.)
782 exactly the same thing but the consequence shall how to say that (.) the effect that it brings
783 about is causing the medium to behave like as it should be at a physiological pH in the
784 general body but again its general so

785 **[00:6:50] so it's all the time (.) now (.) in the same body it's not the same (.) uh?**

786 [00:6: 52] Yeah yeah (.) so in the body (.) you have different local differences

787 **[00:6: 59] In all types of cells?**

788 [00:7: 00] In all types of cells (.) different types of cells (.) might require different
789 conditions to function optimal uhh (.) so I think in general of course you have to (.) in the (.)
790 I think the incubator is also like one of those things you're choosing one general condition to
791 make it the most practical in the whole lab sense (.) and if you keep working at that 5%
792 condition all the time then this parameter is not going to be a variant in the experJoannet so
793 that's why it's good to keep it stable but in principle it doesn't mean that (.) actually to to put it
794 in best results maybe you should have standing incubator with different amounts (.) it's a
795 choice that's been made (.)

796 **[00:8: 04] okay so all the organs?**

797 [00:8:05] yeah I think so (.) it's like for example we're working on Colon cells (.) and colon
798 cells normally at least different layers in the inside they are growing in more acidic
799 environment like with lower pH it could be 6 or something that is much lower than the
800 general pH of 7.4 so maybe for these colon cells actually (.) it'd be beneficial to have a
801 different co2 level

802

803 **BRIAN 6**

804 **[00:04:47] ok (.) is the 5% co2 the same condition in the human body?**

805 [00:04:55] I'm not sure (.) I'm not 100% sure but I guess so (.) I'm not sure

806 **[00:05:03] all the time you mean? what do you mean you guess so**

807 [00:05:05] no I guess it's like a compromise of course when you have the arteries and the
808 veins there is more co2 in the arteries (.) it's like the oxygen it's not constant it's like a cycle
809 (.) but I guess it's the compromise in the body like the average

810 **[00:05:34] ok (.) so in all type of cells? You mean all type of cells they vary?**

811 [00:05:40] yes levels of co2 always vary is like oxygen the blood carries new oxygen to the
812 cells and then removes the co2

813 **[00:05:54] within all organs?**

814 [00:05:54] yeah

815

816 **DANIEL 6**

817 **[00:06:04] Je préfère qu'on procède question par question (.) Is 5% of co2 the same**
818 **condition of the human body? Est ce qu'on peut dire comme dans le corps humain**

819 [00:06:09] non

820 **[00:06:15] ok (.) c'est pas partout donc? all th time? c'est nécessairement tout le temps il**
821 **y a des différences d'eau ça dépend de l'organe ? ça dép [**

822 [00:06:25] [oui ça dépend u::hhhh de l'organe (.) de la perfusion même au sein de l'organe
823 est ce que c'est près d'un vaisseau sanguin donc il ya plus d'échange o2 (.) co2 u::h (.) oui
824 c'est à la fois entre les organes mais à l'intérieur d'un l'organe il y aura des variations de co2
825 (.) concentration co2 et d'oxygène [

826 **[00:06:54] [et dans tout type de cellule?**

827 [00:07:00] uh hh oui oui oui tous les types de cellules ont infectées que ce soit des cellules qui
828 sont dans le sang ou des cellules de tissu (.) clairement c'est (.) de toutes façons 5% de co2 (.)
829 c'est pas représentatif de tous de tous les types cellulaire à des conditions (.)

830 **[00:07:30] quand c'est représentatif (.) là on est en train de faire de la culture cellulaire**
831 **imiter ce qui se passe dans le corps (.) est ce que en fait qu'on est pas en entrain de**
832 **donner les mêmes conditions à ces cellules sur lesquelles on travaille (.) peut biaiser la**
833 **recherche ou non?**

834 [00:07:47] ça peut biaiser mais on connaît le biais

835 **[00:07:53] ah d'accord**

836 [00:07:55] donc c'est comme (.) là on parle du co2 (.) mais la culture cellulaire (.) la façon
837 dont on fait (.) en boîtes en plastique (.) c'est aussi un biais c'est une force pousse les cellules
838 à s'attacher à un plastique (.) alors que dans le corps humain c'est vrai Joannet pas les
839 conditions uhm c'est ça on les connaît ces biais que ce soit le co2 (.) les conditions de
840 cultures sur les plastiques (.) donc ça on a quand même en fait que les conditions qu'on
841 utilise pour les cultures sont différentes de ce qui se passe dans le corps humain (.) et c'est ça
842 que de toutes façons que ce qu'on fait à l'échelle de la culture cellulaire (.) ensuite après on va
843 voir dans un organisme (.) une souris ou (.) pour voir si on peut trouver les mêmes résultats
844 **[00:08:51] [et donc si J'ai compris (.) ça ne pose pas de problème puisque vous**
845 **connaissez la limite des problèmes**
846 [00:09:00] oui
847 **[00:09:00] donc ça pose pas de problèmes**
848 [00:09:04] on accepte ces faits
849 **[00:09:04] d'accord (.) sinon si on a la possibilité de changer de modifier le co2 pour**
850 **mieux imiter le corps est ce que c'est mieux ou pas faisable ou quoi?**
851 [00:09:20] si je pense que c'est faisable et uh (.) de toutes façons si on peut trouver des
852 solutions pour lesquelles on sera plus proche de ce qui se passe dans le corps c'est mieux (.) si
853 on peut adapter avec la concentration de co2 et d'oxygène (.) uhm les concentrations des
854 nutriments qu'on donne aux cellules (.) les conditions de cultures (.) pas forcément en
855 plastique (.) peut être dans des systèmes 3D quelque chose comme ça (.) tout ça (.) voilà c'est
856 sur qu'on se rapprochera plus d'un modèle (.) d'un modèle qui est pertinent par rapport à (.)
857 **[00:10:02] D'accord (.) tout ce que j'ai compris maintenant c'est que le co2 à 5% pour**
858 **maintenir le niveau de pH à 7.4**
859 [00:10:11] oui
860 **[00:10:12] (.) ce qui se passe dans le corps aussi**

861 [00:10:16] oui

862 **[00:10:17] mais en même temps ce niveau là de co2 (.) est ce que (.) il va (.) peut être (.)**
863 **si tu testes un drug (.) peut être une réaction (.) est ce que ces cellules qui n'ont pas le**
864 **même taux de co2 indépendamment du pH (.) vont réagir autrement et du coup tu ne**
865 **vas pas pouvoir voir l'effet**

866 [00:10:39] non on ne saura pas (.) dans la culture de cellulaire qu'on a (.) clairement ça (.) on
867 ne le saura pas

868 **[00:10:44] et si on ne le saura pas on va déduire que le Drug n'a pas marché**

869 [00:10:47] oui

870 **[00:10:49] c'est un problème? (.) combien de drugs vous testez sur des cellules qui n'ont**
871 **pas ces 5% de taux et quand vous dites bon ça ne marche pas (.) alors qu'on sait pas que**
872 **vraJoannet cette condition du co2 uhm**

873 [00:11:10] mais (.) non clairement fin c'est sûr qu'on va conclure que la drogue n'a pas d'effet

874 **[00:11:18] oui**

875 [00:11:21] mais voila malheureusement ça sera un faux négatif (.) par rapport à ce qui
876 pourrait se passait dans un organisme (.) après je pense qu'il vaut mieux avoir un faux négatif
877 qu'un faux positif et qu'on va continuer à travailler dessus et qu'à la fin en intervenant en fait
878 ce qu'on voyait était autre chose

879 **[00:11:53] et combien de choses négatives il ya?**

880 [00:11:56] ça c'est difficiles à (.) difficiles à dire ça (.) de toutes façons on peut dire plus l'un
881 dote d'un taux de changement dans l'environnement ne serait ce que le co2 (.) le pH aussi (.)
882 ça c'est mon sujet de post doc (.) le pH aussi a un impact sur l'effet de certaines drogues qui
883 sont pas forcément acides à pH 7.4 dont les pH acides sont utiles (.) donc c'est clair que dans
884 les conditions normales de cultures on ne voit pas l'effet (.) qu'on va dire la drogue n'a pas
885 l'effet (.) et on met un pH acide (.) a un effet (.) c'est en changeant un peu les conditions de

886 cultures qu'on va essayer de trouver (.) mais (.) clairement (.) on passe surement à coté de
887 certaines choses dues au fait qu'on a des conditions de cultures standards

888 **[00:12:53] Mais le problème que j'ai avec ça (.) c'est que ces des conditions vraJoannet**
889 **centrales qui sont (.) enfin toutes les cellules (.) toutes les expériences passent par**
890 **l'incubateur dans le monde entier donc c'est pas une un facteur marginal ou quelque**
891 **chose (.)**

892 [00:13:11] oui mais après il faut aussi (.) qu'un moment donné il faut se dire (.) ce qu'on
893 utilise (.) ces conditions là (.) c'est que tout le monde applique on peut pas (.) nous après bon
894 on sait plus comparer à ce qui a été obtenu dans le laboratoire d'à coté ou chez nous (.) ça
895 devient difficile par ce qu'il y en a un qui ont travaillé sur 5% de co2 l'autre à 2.5 l'autre à
896 10% (.) et après c'est difficile de s'il y en a qui disent ben nous on a une drogue qui agit (.)
897 nous on va tester (.) ben non elle réagit pas (.)

898 **[00:13:47] Mais elle ne réagit pas parce que voilà les conditions qui sont différentes (.) il**
899 **faut mettre (.)**

900 [00:13:51] Oui

901 **[00:13:53] c'est bien (.) pour moi (.) je pense que c'est bien de varier les conditions (.)**

902 [00:13:58] Oui (.) oui après tu faire l'objet d'un projet de recherche clairement (.) ça peut être
903 l'impact de la concentration de co2 sur l'efficacité de certaines drogues (.) mais (.) après ça
904 reste un projet bien spécifique on peut pas non plus (.) il faut quand même qu'on rentre dans
905 les clous entre guillemets de

906 **[00:14:20] non mais je veux dire (.) si vous faites ici dans ce laboratoire vous travaillez**
907 **sur 5 (.) 6 (.) 7 (.) 17 (.) 20 de co2 comme vous voulez (.) quand vous publiez vous allez**
908 **dire que vous avez travaillé avec des incubateurs à 15% (.) si tu me dis que les autres**
909 **ont besoins (.) pour standardiser (.) Ils ont besoin de garder (.) pourquoi? (.) ils peuvent**
910 **essayer à 15 comme vous mais ils peuvent aussi se dire (.) non on va tester à 5 et si on**

911 **teste à 5 et ça marche pas on va savoir que cette condition là est la seule qui a fait (.) qui**
912 **a changé les résultats (.) ben pourquoi vous considérez qu'il faut standardiser à 5%?**

913 [00:15:01] ben (.) c'est un moment (.) on peut pas tout tester à (.)

914 [00:15:09] **C'est pas le sens de tester (.) ce sont des conditions (.) vous travaillez sur la**
915 **recherche (.) mais ça vous ne prenez pas comme test (.) vous variez juste (.) chaque fois**
916 **vous variez le taux (.) c'est ce que je veux dire**

917 [00:15:20] oui ouais ouais

918 [00:15:22] **c'est pas pour tester les co2 (.) c'est pour varier les conditions (.) puisque 5%**
919 **c'est aussi aléatoire (.) à part le truc du pH**

920 [00:15:29] oui mais le pH c'est quand même aussi quelque chose d'important

921 [00:15:34] **il faut le garder**

922 [00:15:35] oui

923 [00:15:36] **d'accord (.) donc la contrainte c'est il faut toujours garder**

924 [00:15:37] oui (.) je t'ai (.) oui.

925

926 **DILARA 6**

927 [00:07:15] **Is the 5% co2 the same condition in the human body? Est ce que dans le**
928 **corps humain (.) c'est la même condition 5%?**

929 [00:07:23] J'en sais rien (.) Je sais pas (.) j'en sais rien (.)

930 [00:07:34] **Tout le temps? Within all types of organs? Est ce que tu penses que ça varie?**
931 **ça dépend du type de la cellule (.) en fin de l'organe (.)**

932 [00:07:43] Oui (.) ça dépend (.) il ya (.) je pense pas que ce soit constant c'est un peu comme
933 l'oxygène mais (.) et puis si en vient au cancer c'est pareil (.) avec la composition de la
934 tumeur qui forcément des variations et des radiances certainement dans les issus et dans les
935 organes avec des seuils limites (.) je connais pas la (.) je connais pas la limite

936 **[00:08:16] Et donc ça dépend des organes?**

937 [00:08:19] Non (.) je pense pas (.) mais peut être (.) ça dépend peut être des conditions (.) si
938 on court si on se repose (.) par exemple j'ai entendu que les moustiques venaient piquer les
939 gens qui dégageaient plus de co2 (.) ça veut dire qu'il y en a un qui a une respiration plus
940 rapide que l'autre (.) qu'il a dégagé plus de co2 donc peut être que ça a un impact sur le taux
941 en co2 dans le corps (.) et je pense pas que c'est significatif (.) Je n'en sais rien en fait
942 ((laughter))

943

944 **GAELE 6**

945 **[00:04:43] behavior (.) ok (.) you partly answered a bit of my next question (.) but I need**
946 **to go in this order anyway (.) is 5% of co2 the same condition is the human body? The**
947 **whole body**

948 [00:05:01] uhm it's because we have to have a buffered condition it's (.) in our body we have
949 different stock also to make our body buffered around 7.4

950 **[00:05:21] It's usually around 7 you said?**

951 [00:05:22] 7.4

952 **[00:05:24] 7.4?**

953 [00:05:28] Yes (.)

954 **[00:05:28] Of co2 you're talking or pH?**

955 [00:05:28] Ah non non non (.) about pH (.) it's to regulate the pH

956 **[00:05:30] No no (.) I mean**

957 [00:05:32] Yes (.) but co2 it's to buffered the medium to keep it around 7.4 and in our body
958 we uhm we have different stuff to regulate our pH (.) pH around 7.4 and there is also a
959 balance between uhmm "hydroline de carbonate" ((laughter)) but it's to keep uhm the blood
960 uhm buffered around 7.4

961 **[00:06:12] Now with regard to the level of co2 itself (.) in the body (.) is it everywhere**
962 **5% or depends?**

963 [00:06:26] uhm I cannot answer this question

964 **[00:06:30] uhum(.) So you don' know.**

965 [00:06:36] because (.) for me (.) it's a way to buffer in the incubator it's a way to buffer the
966 medium to keep it around 7.4(.) in our body we have like the (.) ion (.) ions(.) to make it uhm
967 around 7.4 it's uhm

968 **[00:07:06] so you linked it very very tightly to the question of pH**

969 [00:07:09] yeah

970 **[00:07:10] I'm all all the time asking about co2**

971 [00:07:11] Yes (.) but it's related

972 **[00:07:13] and you are constantly constantly talking about the pH**

973 [00:07:14] yes (.) because in fact (.) when we need something buffered (.) it's because if had
974 acids or basic in your medium (.) it will not change the pH so much because it's buffered (.)
975 it's

976 **[00:07:33] but but with regard to the co2 itself (.) the question is you don't know if it**
977 **depends where the organ? (.) Do you know if the level of co2 in the body depends on the**
978 **organ? On the place (.) where in the body?**

979 [00:07:49] uhm (.) yes (.) your (.) for example (.) it will be different in your lungs I mean in
980 the rest

981 **[00:08:12] so it's usually different depending on where in the body**

982 [00:08:15] For me mostly it's the same (.)

983 **[00:08:20] in the whole body?**

984 [00:08:21] not in the lungs

985 **[00:08:25] For example in the colon (.) would it be more or less**

986 [00:08:30] I cannot answer

987

988 **CÉDRIC 6**

989 **[00:05:33] ok (.) is 5% co2 the same condition in the human body?**

990 [00:05:41] I know you have like (.) the co2 the cell reject (.) I'm not sure that as high as 5%

991 **[00:05:54] not sure if it's all time or not sure (.)**

992 [00:05:56] Yeah also it's not the same (.) because here it's (.) it's (.) how to say that (.) uh (.)

993 5% in here (.) you go here and don't have here like that

994 **[00:06:11] ok (.) so different types of cells have different concentrations of co2 may be?**

995 [00:06:18] yeah (.) it depend of the respiration of the cell

996 **[00:06:23] within all organs (.) so also it depends**

997 [00:06:25] Yeah (.) again it depends all the cells don't take the same input of co2 (.) of

998 oxygen then they don't transform it at the same rate

999

1000 **PAUL 6**

1001 **[00:10:26] well (.) actually I'm talking about considering the (.) I'm not talking about**
1002 **the pH (.) the 5% is it the same condition in the human body? So the human body does**
1003 **have 5%?**

1004 **[00:10:33] No**

1005 **[00:10:34] NO (.) ok so it varies**

1006 **[00:10:34] Yes**

1007 **[00:10:35] Depending on the organ (.) on the type of cell (.) on the (.)**

1008 **[00:10:35] Yes**

1009

1010

1011 **DALILA 6**

1012 **[00:05:38] ok (.) Maintenant (.) is 5% of (.) bien sur le but de ce de la culture cellulaire**
1013 **c'est de de d'imiter ah ce qui se passe dans le corps humain**

1014 **[00:04:40] oui**

1015 **[00:05:43] d'imiter ah ce qui se passe dans le corps humain (.) but is 5% of co2 the**
1016 **same condition in the human body ? C'est la même condition dans le [**

1017 **[00:05:52] [Je pense pas**

1018 **[00:05:53] Tu penses pas**

1019 **[00:05:54] non**

1020 **[00:05:59] donc euh**

1021 **[00:06:00] Pour moi c'est (.) quelque chose qui a qui a été (.) on est à in vivo on est in vitro**
1022 **donc il ya des artéfacts et donc pour moi ce serait par exemple un artéfact c'est que puisque le**
1023 **pourcentage de co2 n'est déjà pas le même partout pareil que le pH (.) donc c'est juste (.) là**
1024 **maintenant les cellules on les maintient dans telles conditions et c'est pour ça que parfois on**
1025 **passé à en in vivo on a pas la même chose (.) parce qu'on peut pas reproduire tip top ce qui**
1026 **se passe dans le corps**

1027

1028 **MARIE 6**

1029 **[00:03:29] ok (.) is the 5% co2 the same condition in the human body? Est-ce que dans**
1030 **le corps humain(.)**

1031 **[00:03:38] No**

1032 **[00:03:39] No? c'est pas 5% dans le corps humain?**

1033 **[00:03:41] C'est pas partout (.)**

1034 **[00:03:43] C'est pas partout? ok (.) donc ça dépend de**

1035 [00:03:47] ça dépend oui de l'échange gazeux (.) où ça se trouve exactement dans le corps (.)
1036 c'est que (.)
1037 **[00:03:52] échange gazeux? ok (.) et ça dépend aussi des organes?**
1038 [00:03:56] oui ça dépend des organes oui
1039
1040 **JOANNE 6**
1041 **[00:05:29] Is 5% the same condition in the human body?**
1042 [00:05:33] no (.) I don't think so (.) it depends
1043 **[00:05:41] it depends on what?**
1044 [00:05:43] in the part of body
1045 **[00:05:46] so not all the time (.) not all the time 5%?**
1046 [00:05:53] No
1047 **[00:05:54] In all types of cells (.) it varies ?**
1048 [00:05:56] I think yes
1049 **[00:06:01] Within all organs (.) so you have to know each organ or for example the type**
1050 **of cancer(.) uhm depending on the for example colon cancer or breast cancer you need**
1051 **to know the organ in order to know what(.) the amount of co2 that is usually there?**
1052 [00:06:20] yes (.) because (.) if it is (.) in the cancer for example (.) if it is normal (.) like in
1053 the first stage it will not be the same cells as in metastatic cells (.) metastatic cells will be far
1054 away from the vessels and the oxygen amount will drop (.) so I think co2 will increase I
1055 think it's different from to cell to cell (.) but (.) I don't know how it works really in this (.)
1056 because when they take the cancer cells I think they storage directly in this condition(.) like
1057 37° and 5% co2 (.) so the cells they are adapted to that condition (.) I think (.) I really don't
1058 know exactly how it works
1059
1060

1061 **7. How do cells intake co2 within incubators (.) when they are constantly locked in**
1062 **containers / wells?**

1063 **STEPHAN 7**

1064 **[00:8:43]: Ok (.) how do cells intake co2 within incubators (.) when they are constantly**
1065 **locked in within containers or the wells?**

1066 [00:08:53]: uh (.) so normally the containers that you use they are (.) they have some
1067 permeable like cap or layer that is allowing gas exchange (.) so there is gas exchange so co2
1068 can reach the cells(.) just by diffusion

1069

1070 **BRIAN 7**

1071 **[00:05:59] how do cells intake co2 within incubators when they are constantly locked**
1072 **within the containers or the wells? How do they intake co2 ?**

1073 [00:06:10] it's not hermetic the containers are not hermetic or closed they allow the
1074 gas exchange so it's not a problem(.) it's not hermetic

1075

1076 **DANIEL 7**

1077 **[00:15:38] D'accord (.) ok donc tout est lié (.) (en regardant dans ses questions au fichier**
1078 **Excel sur l'ordinateur devant lui) donc c'était ça la question (.) alors j'ai des questions**
1079 **qui peuvent être déjà répondues mais c'est pas grave on passe ici (.) alors How do cells**
1080 **intake co2 within incubators (.) when they are constantly locked in within containers ?**
1081 **(.) ils sont déjà (.) donc comment ces cellules vont consommer ce co2 qui circulent dans**
1082 **l'incubateur alors que eux elles sont toujours dans le (.) enfermé**

1083 [00:16:12] en fait les flasques qu'on utilise dans la culture elles ont une membrane poreuse
1084 qui permet l'échange des gaz

1085 **[00:16:21] ah ok**

1086 [00:16:22] donc le co2 et l'oxygène peuvent rentrer dans la flasque

1087

1088 **DILARA 7**

1089 **[00:08:51] How do cells intake co2 within incubators when they are constantly locked**
1090 **in within containers? soit ils sont dans les puits ou dans les flasques**

1091 [00:09:01] oui

1092 **[00:09:03] Comment ils prennent le co2 alors qu'ils sont renfermés?**

1093 [00:09:06] Ah c'est parce qu'il ya échange (.) un équilibre de gaz qui se fait entre l'ai
1094 environnant et le milieu

1095 **[00:09:18] Comment se fait-il?**

1096 [00:09:21] Comment en détail j'en sais rien (.) ce sont des (.) ça c'est un détail physique (.)
1097 mais un équilibre qui se fait entre le composé du gaz (.) l'air ambiant et (.)

1098 **[00:09:32] Comment il rentre dans les puits où les cellules sont là dans le milieu?**

1099 [00:09:36] Par gaz (.) c'est un échange ça (.) c'est une (.)

1100 **[00:09:41] Donc la réponse (.) donc c'est pas hermétiquement fermé?**

1101 [00:09:42] Non

1102 **[00:09:43] Donc voilà c'est ça**

1103 [00:09:45] Ah oui non non

1104 **[00:09:46] Il nous reste 5 minutes**

1105 [00:09:47] ((laughter))

1106 **[00:09:51] c'est ça?**

1107 [00:09:50] Laughter

1108

1109 **GAELLE 7**

1110 **[00:08:33] You don't know exactly ok (.) Now how do cells intake co2 within**
1111 **incubators (.) when they are constantly locked in within containers or the wells?**

1112 [00:08:49] Because it's not totally hermetic

1113 **[00:08:56] How is that**

1114 [00:08:59] Not hermetic?

1115 **[00:09:00] How is it not hermetic?**

1116 [00:09:02] Because it depends on the flask you use (.) for example (.) I've a flask with a cap

1117 with a filter (.) and it's through this filter that the air is going out (.) out and in

1118 **[00:09:24] the holes you mean (.) les "trous"?**

1119 [00:09:27] in the filter

1120 **[00:09:27] Yeah ok (.) that's**

1121 [00:09:27] but it's small very small uhm

1122 **[00:09:29] that allow air to get in?**

1123 [00:09:32] Yeah

1124

1125 **CÉDRIC 7**

1126 **[00:06:39] ok (.) now how do cells intake co2 when they are constantly locked in within**

1127 **incubators? They are locked right?**

1128 [00:06:52] ah you mean the (.) "les bouchons" ah yeah yeah yeah you're talking about the

1129 wells (.)

1130 **[00:07:00] Yeah they are in the wells or in the containers and they are locked**

1131 [00:07:04] it's not air tight (.)

1132 **[00:07:05] not air tight**

1133 [00:07:06] yeah it's not air tight (.) if it was (.) your cell which is in it will die (.) ()

1134 **[00:07:17] I see so it's not air tight (.) so they take from the holes like a filter or**

1135 **something that gets**

1136 [00:07:24] yeah it's just just a smallest (.) so it can get through air and stuff like that

1137 **PAUL 7**

1138 **[00:10:43] and how do cells intake co2 within incubators when they are constantly**
1139 **locked in within containers or the wells?(.) this is just an intermediary question**

1140 **[00:10:57]** The wells are not hermetic they are ...

1141 **[00:11:03] Ok (.) everyone answered the same here ((laughter))**

1142 **DALILA 7**

1143 **[00:06:42] d'accord (.) how do cells intake co2 within incubators when they are**
1144 **constantly locked in within containers or the wells? Donc comment qu'ils prennent le**

1145 **[00:06:52]** Il ya un filtre sur le bouchon

1146 **[00:06:54] d'accord (.) Donc c'est à travers le filtre**

1147 **[00:06:54]** Oui

1148 **[00:06:56] Donc c'est pas hermétique**

1149 **[00:06:57]** non (.) et les plaques il ya un jeu je pense au niveau des plaques (.) au niveau des
1150 couvercles qui fait que les échanges gazeux se font

1151

1152 **MARIE 7**

1153 **[00:03:59] ok (.) how do cells intake the co2 within incubators when they are constantly**
1154 **locked in within containers? Ils sont complètement dans les flasques**

1155 **[00:04:11]** oui (.) donc les contenants ne sont pas fermés hermétiquement (.) c'est ouvert il ya
1156 les filtres ce système (.) oui de (.) d'équilibre

1157 **[00:04:24] qui permet ce**

1158 **[00:04:24]** qui permet oui

1159 **[00:04:25] l'entrée de co2 dans le flaque c'est ça?**

1160 **[00:04:26]** oui tout à fait

1161

1162 **JOANNE 7**

1163 **[00:07:28] ok (.) now how do cells intake co2 (.) within incubators (.) when they are**
1164 **constantly locked in within containers or the wells (.) How they take the co2?**

1165 **[00:07:41] I don't know ((laughter)) I don't know (.)**

1166 **[00:07:48] But you understand the point?**

1167 **[00:07:50] Yes I understand (.) so if it is locked how they can take the**

1168 **[00:07:54] the co2**

1169 **[00:07:55] Yes how I don't know**

1170 **[00:07:58] I can give you an answer**

1171 **[00:07:59] Yes give me**

1172 **[00:08:00] ((laughter)) (.) your colleagues said that because they are not totally tight or**
1173 **sealed (.) it's because there is a filter and there are some holes (.) so the co2 gets**
1174 **through the holes of the filter (.) it's not completely sealed**

1175 **[00:08:15] ah ok**

1176 **[00:08:16] Ok? ((laughter)) how much you're gonna pay me?**

1177 **[00:08:20] yes (.)**

1178 **[00:08:22] for this**

1179 **[00:08:22] Now (.) I'm learning from you see?**

1180 **[00:08:25] Not me (.) it's your colleagues**

1181

1182 **8. How true is this : "incubators are regulated at 5% co2 because that is how the**
1183 **desired pH level can be maintained"?**

1184

1185

1186 **STEPHAN 8**

1187 **[00:9:24]: How true is this : " incubators are regulated to 5% (.) because that is how**
1188 **the desired pH level can be maintained"?**

1189 **[00:9:35]:** U:::h (.) I think it's true in that sense if the pH that is maintained is indeed the one
1190 that you want but it depends of your pH level and the compatibility of your medium (.)
1191 but for general settings in which (.) then you're saying something that is correct (.)

1192

1193 **BRIAN 8**

1194 **[00:06:30] Now how true is this "incubators are regulated to 5% co2 because that is**
1195 **how the desired pH level can be maintained"**

1196 [00:06:44] the question is?

1197 **[00:06:49] "incubators are regulated to 5% co2 because that is how the desired pH**
1198 **level can be maintained" (.) to maintain the pH level (.)**

1199 [00:07:01] yes this could be (.) this is for sure one reason (.) this I can tell you because we
1200 have problem with in Spain when I was doing my PhD we had problems with the
1201 incubator with the co2 was not calibrated (.) so we could see the color of the medium what
1202 changing towards more acidic or more (.) it was more like pink so it's a (.) it regulates the pH
1203 in the medium (.) this is for sure.

1204

1205

1206 **DANIEL 8**

1207 **[00:16:29] (regarde dans son fichier) (.) ok c'était ça la question: How true is this**

1208 **"incubators are regulated to 5% co2 (.) because this is how the PH level can be**

1209 **maintained" (.)**

1210 **[00:16:46] Yes**

1211

1212 **DILARA 8**

1213 **[00:09:51] How true is this? "incubators are regulated to 5% (.) because that is how the**

1214 **pH level can be maintained**

1215 **[00:10:06] Et Je dois dire c'est vrai ou faux?**

1216 **[00:10:06] oui**

1217 **[00:10:07] ou négociier?**

1218 **[00:10:08] Qu'est ce que tu en penses? C'est maintenir le niveau du pH**

1219 **[00:10:10] Oui (.) ça peut être vrai et en même temps on peut ajouter aussi des tampons dans**

1220 **le milieu qui permet de maintenir un pH constant**

1221

1222 **GAELLE 8**

1223 **[00:09:35] ok (.) uhm (.) how true is this: "incubators are regulated at 5% (.) because**

1224 **that is how the desired pH level can be maintained"**

1225 **[00:09:51] the what?**

1226 **[00:09:51] The desired pH level can be maintained how true is this?**

1227 **[00:09:55] yes (.) true**

1228

1229

1230 **CÉDRIC 8**

1231 **[00:07:32] ok (.) now how true is this " incubators are regulated to 5% co2 (.) because**
1232 **that is how the pH level can be maintained?**

1233 [00:07:47] Yes (.) that's quite right I guess (.) yeah

1234 **[00:07:57] Ok now if this is the reason**

1235 [00:08:11] ok (.) yeah may be (.) ok

1236 **[00:08:25] so (.) what (.) what what are (.) examples of what other negative**
1237 **consequences**

1238 [00:08:32] like (.) I could think about it (.) but right now like that (.) I would may be give you
1239 an answer later (.) if I think about it

1240 **[00:08:46] Ok (.) now (.) but there may be negative consequences**

1241 [00:08:51] yeah may be

1242 **[00:08:53] for sure it's possible?**

1243 [00:08:54] It's possible

1244 **[00:08:56] So (.) when I said earlier in my question (.) you said(.) 5% you said (.) we just**
1245 **need to know (.) but not necessarily to question it again or try to change (.) do you**
1246 **change your mind now if you hear this?**

1247 [00:09:11] yeah because (.) yeah if (.) it's (.) what I was telling you (.) it's cell dependent for
1248 some experJoannet for sure you won't need the 5% (.) may be like if you're cultivating
1249 bacteria then you can just (.) with like that you don't need to ensure that it's 5% co2 so just
1250 you have to know what you are cultivating and what the need of the cell you are cultivating
1251 are

1252 **[00:09:41] So the idea of having incubators set to 5% can be ok for the pH (.) but can be**
1253 **very negative for other things (.) or have negative consequences on other things?**

1254 [00:10:00] yeah(.) not sure like that really big consequences (.) it's just the purpose of it is
1255 yeah to maintain the pH (.) I guess then it doesn't affect much the cell

1256 **[00:10:17] If you know that for example most of the in vitro cells research fail and only**
1257 **may be 1/4 or I don't know 20% pass to the in vitro right?**

1258 [00:10:33] ()

1259 **[00:10:35] The in vivo**

1260 [00:10:36] yeah

1261 **[00:10:36] most of the in vivo research don't get to the in vitro (.) sorry to the in vivo**
1262 **right?**

1263 [00:10:43] Is it a real number?

1264 **[00:10:47] I don't know (.) but is it true that most of in vitro fail(.) don't go the in vivo?**

1265 [00:10:55] Well I don't know (.) I don't have so much background to tell you about that (.)
1266 because in my lab (.) it was ... yeah it was mostly to have () that we have been working in
1267 vitro to use them in vivo (.) and for the in vivo experJoannet (.) yes they were working pretty
1268 good (.) so I don't know (.) I don't know for this lab

1269 **[00:11:21] Usually (.) most of the research fail (.) only...**

1270 [00:11:26] oh yeah

1271 **[00:11:27] only a small part of it (.) but the idea of the incubator is a central condition**
1272 **(.) because every single research goes through the incubator (.) Would that be a factor**
1273 **that causes for example resistance we'll talk about resistance later (.) The cells**
1274 **resistance (.) Would that be a factor (.) no?**

1275 [00:11:53] I guess not so important than resistance or stuff like that (.) because (.) yeah (.) I
1276 mean (.) if you have your cell and that they are growing fine (.) and that you can their
1277 phenotype is good (.) then if the research fails (.) it's not because of the 5% (.) because your
1278 cell were you know they were ok

1279

1280

1281 **PAUL 8**

1282 **[00:11:07] Ok (.) how true is this “incubators are regulated to 5% co2 (.) because that is**
1283 **how the desired pH level can be maintained”?**

1284 **[00:11:21] Say it again**

1285 **[00:11:23] incubators are regulated at 5% co2 (.) because that is how the desired pH**
1286 **level can be maintained?**

1287 **[00:11:32] Yeah it’s correct**

1288

1289 **DALILA 8**

1290 **[00:07:09] d’accord maintenant la question suivante (.) How true is this (.) comment ça**
1291 **est ce que c’est vrai ou c’est pas vrai « incubators are regulated to 5% co2 because that**
1292 **is how the desired pH level can be maintained » donc c’est pour maintenir le niveau**
1293 **désiré du pH**

1294 **[00:07:32] oui**

1295 **[00:07:32] c’est correct ?**

1296 **[00:07:33] oui**

1297 **[00:06:38] donc c’est même pas pour maintenir 7.4% euh 7.4 en particulier (.) c’est le**
1298 **niveau qu’on cherche**

1299 **[00:07:45] oui**

1300 **[00:07:45] quelque soit le niveau ?**

1301 **[00:07:47] oui**

1302 **[00:07:48] ok (.) uhm**

1303 **[00:07:47] c’est le milieu(.) je dois justifier non ?**

1304 **[00:07:55] non non (.) oui oui**

1305 **[00:07:56] Ben dans notre milieu on a le pH qu’on veut**

1306 **[00:07:58]** Uhm

1307 **[00:07:59]** après bon... il ya le tampon(.) va éviter justement les grandes variations et que ça
1308 reste aux alentours de ce pH là mais pour moi on est pas à 7.4 toujours si je met des cellules à
1309 6.5 le co2 ne va pas permettre à le mettre à 7.4 puisque je veux qu'elle soit à 6.5

1310 **[00:08:23]** donc cinq virgule (.) uh 5% de co2 ça maintient le niveau quelque soit le
1311 niveau

1312 **[00:08:24]** voilà décidément avec des p'tites variations mais légères par ce que justement il
1313 ya cet équilibre qui se fait

1314 **[00:08:33]** Ok le but toujours c'est le pH

1315 **[00:08:33]** oui

1316 **[00:14:10]** Je sais pas (.) le pH peut changer le phénotype donc pourquoi pas les 5% aussi

1317

1318 **MARIE 8**

1319 **[00:04:28]** d'accord(.) Now how true is this: incubators are regulated at 5% co2 (.)
1320 because this is how the desired pH level can be maintained(.) c'est pour maintenir le
1321 niveau du pH c'est ça?

1322 **[00:04:45]** oui

1323 **[00:04:47]** mais est ce que c'est pour maintenir le niveau du pH quelque soit le niveau
1324 ou bien le niveau de 7.4?

1325 **[00:04:54]** Quelque soit le niveau

1326 **[00:04:56]** d'accord (.) par exemple on a des milieux à différents pH et voilà
1327 justement grâce à cet (.) grâce à ce système de tamponnage puisque le co2 fait partie de ça
1328 avec les autres composants dans le milieu (.) le pH est maintenu peu importe lequel il est
1329 mais il est maintenu quoi

1330 **[00:05:18] donc les milieux qui sont vraJoannet à 6.5 par exemple passent toujours par**
1331 **cet incubateur?**

1332 [00:05:24] oui

1333 **[00:05:25] Et vous savez quand même que vraJoannet le pH est maintenu ?**

1334 [00:05:31] uhm ça était vérifié au préalable (.) pour ceux qui font telle ou telle condition pour
1335 que (.)

1336 **[00:05:35] Au préalable? non mais vous pouvez savoir à partir de la couleur par**
1337 **exemple?**

1338 [00:05:38] ah oui par exemple oui (.) mais de toute façon plus elle consiste plus elle vieillit (.)
1339 enfin plus elles sont dans la flasque voilà le milieu va changer de couleur (.) ça a
1340 généralement un air plus basique et donc (.) du coup (.) enfin là on sait qu'elles sont plus dans
1341 de bonnes conditions que le 7.4 est passé mais du coup généralement on sait qu'on va les
1342 rincer dans un nouveau milieu

1343

1344 **JOANNE 8**

1345 **[00:08:26] How true is this: incubators are regulated to 5% (.) because that is how the**
1346 **desired pH level can be maintained**

1347 [00:08:45] I don't know

1348 **[00:08:46] ok (.) many of your colleagues the post docs and the PhD said it's related to**
1349 **the pH level (.) It's been tested before and it was found that co2 (.) if it's 5% then the**
1350 **pH level would be 7.4 which is the desire (.) Normal level (.) what do you think about**
1351 **this?**

1352 [00:09:11] I don't know if it is real or not (.) but we (.) like here we are culturing cells not only
1353 in pH 7.4 but also 6.5 (.) so if they're saying that 5% co2 is desired for cells with pH 7.4 (.)
1354 so what about the cells with 6.5? See what I mean?

1355 **[00:09:41] I see (.) so (.) if you make seven uh 5% you don't always have 7.4 but you**
1356 **don't always want 7.4 because sometimes you work on other**
1357 [00:09:56] Yes like for example (.) me (.) I'm working with 2 conditions (.) 7.4 (.) pH 7.4 and
1358 pH 6.5 (.)
1359 **[00:10:07] So (.) that means that in order to have pH 6.5 (.) you need another incubator**
1360 **with another level of co2 ?**
1361 [00:10:14] If what you are saying is true ((laughter)) [
1362 **[00:10:16] [((laughter)) (.) I mean (.) the (.) What I'm saying is real (.) they said and I**
1363 **have recordings now**
1364 [00:10:25] may be they said (.) I don't know (.) maybe they said 5% co2 is required to
1365 maintain the pH level
1366 **[00:10:36] Yeah yeah they said 5% co2 maintains 7.4 pH level**
1367 [00:10:42] they said 7.4? it's not to maintain the pH level
1368 **[00:10:48] what do you mean pH level?**
1369 [00:10:48] Like if you put pH 6.5 or 7.4 with 5% co2 (.)
1370 **[00:10:55] it would stay (.) No matter how much the level is it would stay with 5% co2?**
1371 [00:11:01] Yes it will maintain the pH
1372 **[00:11:04] Ok (.) this is very interesting to ask (.) you mean 5% co2 (.) would maintain**
1373 **no matter what the level of pH right?**
1374 [00:11:13] Yes (.) yes (.) So if it is (.)
1375 **[00:11:16] Could this be possible?**
1376 [00:11:16] I don't know (.) I don't really know
1377 **[00:11:21] Ok (.) so**

1378 [00:11:22] So (.) if it is required for 7.4 (.) pH 7.4 so I don't think it's good for cells of pH 6.5
1379 see (.) but if it required to just maintain the pH in that level stable so I think(.) I think this is
1380 the right
1381 **[00:11:44] So (.) I think you ad you ad(.) you kind of answered part of the next**
1382 **question(.) let me tell you the next question**
1383 [00:11:49] ok what is

1384 **9. What other negative consequences can happen to the cells (.) due to this 5% level?**

1385

1386 **STEPHAN 9**

1387 **[00:10:08]: If this is the reason or one of the reasons why incubators are calibrated to**

1388 **5% what other negative consequences that can happen to the cells on which you work?**

1389 [00:10:19]: the negative consequences of setting it at this value (.) you mean?

1390 **[10: 24] Yeah**

1391 [00:10:25]: so with the cells (.) maybe that I'm working on (.) if (.) () you could not be

1392 finding (.) might be not the optimal result (.) then you would (.) you might find if you set it at

1393 a different level (.) you can find some slightly different outcomes of your studies (.) so yes it

1394 could (.) it could have big implications (.)

1395 **[00:11: 00]: but how (.)**

1396 [00:11: 01]: but

1397 **[00:11:01]: Yeah**

1398 [00:11:01]: also (.) but beside the co2 we also (.) just to (.) if the pH is important for us (.) we

1399 also have other ways to check the pH in our medium (.) so sometimes beside the co2 (.) we

1400 also perform other (.) like. we do additional treatments to control the pH (.) may be to add

1401 chemicals that shifts the balance or we can () program co2 but modify the medium in such a

1402 way that's is still at a different pH than the physiological...and still work

1403 **[00:11: 47]: So why is it (.) You are saying at the one time that this is very important (.)**

1404 **but the other time you you neglected it or considered it unimportant (.) why a central**

1405 **issue like this because every single experJoannet goes through incubators (.) in the**

1406 **whole world (.) it's a central issue not a marginal one. (.) Why is it so?**

1407 [00:11:11]: umh (.) it's also that (.) uhhh (.) biological systems (.) are very complex and at

1408 some point you cannot like control all the parameters involved in the exactly the (.) exact way

1409 that it might be in the body (.) so you have to make choices for some like generalization
1410 purposes to make it workable to perform studies on that (.) and I guess that this is one of
1411 those areas at which some choices made to study this (.) and I think for most practical that
1412 people are (.) sss (.) looking at (.) they can still obtain them (.) () settings (.) but indeed there
1413 might be some studies that would benefit from altering theses conditions

1414 **[00:13:21]: So for example (.) for your own research (.) why don't you decide (.) ok (.) to**
1415 **set a different (.) you have many incubators here right?**

1416 **[00:13:27]: uhum**

1417 **[00:13:28]: so you would I want ok (.) for this research (.) I want to use 10% co2 (.)**
1418 **because I know it's this case for the cells on which I work (.) why don't you do this?**

1419 [00:13:40]: u::hm (.) in my case (.) like uhhh (.) well (.) it's like a different percentage that I
1420 have for me (.) because the co2 level (.) of course (.) it would play a role (.) but I'm more
1421 studying other (.) other effects (.) and (.)

1422 **[00:14: 09]: but you can do both (.) because (.) it's not the condition that you're studying**
1423 **itself (.) you are just mimicking (.) it's part of the culture (.) it's not for the test (.)**
1424 **you're not testing the co2**

1425 [00:14: 19]: No (.) you're not (.) so we are choosing to test one part (.) for the other part than
1426 we have to keep those conditions set

1427 **[00:14:29]: Yeah**

1428 [00:14:30]: Yeah (.) so (.) uhmmm

1429 **[00:14: 35]: I mean this is not a new parameter to add to your research (.) it's just part**
1430 **of the mimicking system (.) you're just mimicking**

1431 [00:14: 43]: well (.) if I (.) if I would find that if I would have clear indications at least for
1432 my cells that the co2 would be better to be set at different levels then maybe I would (.) then
1433 I would just arrange for may be to have an one incubator reprogrammed may be for just a

1434 short time that I can perform my experJoannet at a different level (.) and many people are
1435 using the incubators (.) but at least for the moment for me this is not an issue

1436 **[00:15:21]: ok (.) for example (.) Daniel mentioned that it's important also to get it**
1437 **standardized at 5% (.) because it's used everywhere (.) why we need to standardize it (.)**
1438 **it's not [**

1439 [00:15:40]: [yeah because people like to (.) hhhhh how to say that (.) in research (.) the
1440 world like (.) because everybody used it as this one (.) it's a kind of standard setting (.) and
1441 then if you have results (.) then other people can repeat those things which you made (.)
1442 because everybody (.) pretty much everybody is using 5% (.) so if they want to repeat the
1443 experJoannet they can just put it in the incubator and they don't have to change anything
1444 except for a few parameters (.) so they can easily reproduce those studies (.)

1445 **[00:16: 15]: Ok (.) why do they need to repeat your experJoannet?**

1446 [00:16: 19]: u::hm (.) well (.) sometimes (.) it's still important to repeat studies(.) they are
1447 often small and unpublished (.) that may be later on people try to reproduce those findings
1448 they () (.) and may be they were entire studies that still some (.)

1449 **[00:16:37]: but you mentioned in your research that you set the incubator at 7 or 10%**
1450 **and the person who is going to repeat your research (.) would need to go to (.)**

1451 [00:16:50]: if they are good yeah (.) if you publish your own study (.) then you say (.) ok (.)
1452 you can adjust your incubation temperature then sure (.) you can do. but also many times in
1453 studies people are pacing findings on previous studies (.) so they're using information (.)
1454 that's they say ooh I was using studying this mechanism and other people are already found it
1455 works in this way (.) but if you want to use that as a pace it's yeah (.) you have to make sure
1456 that you're staying within the same setting (.) otherwise you cannot just make those ()
1457 otherwise you will have to validate that whole study again indeed and then just adjust the pH
1458 and redo all those findings to see if it's still the same (.) but in most research they normally

1459 find it much easier than say (.) well we (.) based on that idea we continue like this and use the
1460 same settings (.) so we don't have to revalidate these findings (.) it's much easier in that sense.
1461 Much easier to explain things if you find something of course against to quote other (.) it's a
1462 kind of (.) I don't know if this the word (.) may be if's like laziness (.) maybe not exactly the
1463 right word(.) but it's just easier than to do it (.) to have it comparable against other people's
1464 findings (.)

1465 **[00:18 :25]: Yeah (.) because what is intriguing for me is that if we on the one hand**
1466 **think that this factor/ parameter is important (.) it would have influenced the results**
1467 **and on the other hand to say it's important because I want to make it standardized. Uhh**
1468 **what's the point of standardizing something that is not really mimicking the human**
1469 **body?**

1470 [00:18:53]: yeah yeah sure for those things I also agree (.) like you don't (.) if you have good
1471 reasons why not to (.) to deviate from it (.) I'm like go for it (.) I would just change my
1472 settings and don't just hold on standardizing (.) as long as you report clearly why you do (.)
1473 your reasoning and your finding (.) you don't have to keep necessarily on standardizing (.) or
1474 you can also just repeat your same experJoannet at two different settings and just compare
1475 and just report on that option (.) it's just (.) often people they just copy and go with things
→
1476 that is already done (.) but I agree it's not always the best thing to do.

1477

1478 **BRIAN 9**

1479 **[00:07:33] ok (.) if this is the reason why incubators are regulated at 5% or one of the**
1480 **reasons what are the negative consequences that can happen to the cells on which you**
1481 **work? So you want to maintain the pH level (.) this is why 5% what are the**
1482 **consequences maybe negatives consequences if you keep all the time 5%?**

1483 [00:07:59] yeah you don't know because it's (.) but the cells grow they are healthy (.) they
1484 grow very fast (.) so I don't think it's a big damage for the cells can grow they are immortal
→
1485 **[00:08:26] but (.) is it (.) I mean the the aim is just to keep them alive or you need to**
1486 **check other conditions (.) other (.)**
1487 [00:08:42] the aim is to get them alive because I guess in the beginning to take cells from a
1488 patient or something and to keep them alive it's very difficult had to set up everything
1489 (.) this is one aim and the other aim is to be the more physiological possible
1490 **[00:09:02] to be? Physiological?**
1491 [00:09:02] Yeah like to to mimic the conditions that we have in the body
1492 **[00:09:11] to mimic but it's not mimicking**
1493 [00:09:14] it's not mimicking (.) but with the technology they had in the time it was the way
1494 **[00:09:23] from what I can understand from you as long as you can see or check the**
1495 **cells are alive they are dividing and multiplying then that's a way to make sure that**
1496 **you're fine (.) but what I'm trying to (.)**
1497 [00:09:38] this is one way (.) yes this is one way but it's not (.)uhm everything so it's good to
1498 have the cells healthy (.) but it's also important to mimic the environment as much as possible
1499 **[00:09:57] if you say to mimic but you're not mimicking in the body (.) in the body is not**
1500 **5% all the time (.) you're not mimicking the human body when it's not in the human**
1501 **body 5% of the time**
1502 [00:10:09] Yes (.) I agree it's a limitation of the technique (.) we're [
1503 **[00:10:15] So (.) it's a limitation to the technique (.)**
1504 [00:10:19] = it's not perfect
1505 **[00:10:20] Ok (.) it's not perfect but beyond that is it blinding us from the**
1506 **negative consequences for example (.) if you're setting it at 5% (.) when it should be for**
1507 **example at that moment 3% or 10% this condition doesn't allow the drug to behave as**

1508 **it would in the human body and then you will conclude that ok this doesn't**
1509 **work so we'll not go on to the next step.**

1510 [00:10:53] something that you have to check it's something that you have to check (.) so first
1511 we do itself in the incubator but afterwards we have to go to in vivo system like in mice or
1512 rats and then you check (.) and if it doesn't work on mice then you check okay (.)

1513 **[00:11:15] no I mean how would you go to the mice when you already decided that it**
1514 **didn't work on the cells (.) you would not go**

1515 [00:11:23] no (.) no I see (.) yeah I see (.) it doesn't work on the cells you don't go to the mice
1516 (.)

1517 **[00:11:26] you don't (.)but if this is the reason that makes you decide that the drug**
1518 **doesn't work you wouldn't even go (.) this condition is causing that the drug doesn't**
1519 **work (.) what would you do in this case?**

1520 [00:11:41] if they work (.) the drug doesn't work?

1521 **[00:11:46] if the drug doesn't work you would not go to mice?**

1522 [00:11:48] exactly

1523 **[00:11:49] and if the drug doesn't work because this condition of co2 is is (.) is making**
1524 **the drug doesn't work**

1525 [00:12:00] the thing is that (.) the co2 in the body is 5% the average (.) the problem you have
1526 it in the mice (.) because it would change in the animal you know but in the cells it's
1527 constant 5% it works or it doesn't work (.) but the problem you'll have it in the animal not in
1528 the cells (.) it is more challenging to work on animals than on the cells that are in the
1529 wells you put the concentrations (.) exactly the concentration (.) the pH is always
1530 constant (.) the co2 concentration is always constant (.) the oxygen concentration is always
1531 constant (.) the temperature is always constant (.) so it's more challenging when you go to the
1532 animal then when you are in this (.)

1533 **[00:12:54] ok so are you saying that it is not misleading (.) there is no problem in that?**

1534 [00:12:59] no I don't think (.) I didn't say that

1535 **[00:13:02] what do you mean?**

1536 [00:13:03] I wouldn't say it is misleading

1537 **[00:13:10] so it's not a problem the fact that it's (.) [**

1538 [00:13:13] [I wouldn't see (.) no (.) could be (.) maybe (.) in complications (.) maybe there is

1539 something(.) I don't think it should be a problem because you have all the parameters are

1540 controlled (.) and for me it's not more challenging then in the animals

1541 **[00:13:32] and was this your opinion when we talked about this before?**

1542 [00:13:36] I don't remember (.)

1543 **[00:13:38] ((laughter))**

1544 [00:13:39] but now we are (.) uh(.) following like you know a plan ((in French)) (.) so maybe

1545 it's changing a bit

1546 **[00:13:51] sorry I did not get the point**

1547 [00:13:54] we are following your order (.) of questions (.) we were discussing like (.) so I

1548 don't know it was exactly this ((laughter)) or not(.)

1549 **[00:14:04] no I mean you did not change your opinion since we discuss this last time (.)**

1550 **or may be? (.)**

1551 [00:14:07] I don't remember.

1552 **[00:14:09] you don't remember (.) ok (.)**

1553

1554 **DANIEL 9**

1555 **[00:16:49] What other negative consequences that can happen to the cells on which you**

1556 **work (.) est ce que vous pouvez citer des conséquences?**

1557 [00:16:59] d'être à 5%?

1558 **[00:17:01] oui (.) tu as déjà répondu un peu (.) mais c'est juste la question elle est**
1559 **comme ça**

1560 **→ [00:17:09] Ben une conséquence négative c'est que peut (.) on en a parlé (.) on peut passer à**
1561 **coté de l'effet de certaines drogues (.) on peut être à coté des conditions physiologique du**
1562 **corps humain (.) voilà c'est un biais de la culture (.)**

1563

1564 **DILARA 9**

1565 **00:10:27] ah(.) ok (.) if this is the reason why incubators are regulated to 5% (.) en**
1566 **supposant que c'est la raison (.) what other negative consequences that can happen to**
1567 **the cells on which you work? Tu vas dire (.) je vais mettre l'incubateur à 5% (.) parce**
1568 **que 5% ça maintient le pH (.) mais s'il s'avère que dans le corps humain c'est pas**
1569 **vraJoannet le cas (.) c'est pas 5% (.) quelles ont les conséquences négatives qui peuvent**
1570 **arriver?**

1571 **[00:11:02] ben pour moi la recherche sur des cellules dans des puits en état de culture c'est**
1572 **pour mimer ce qui se passe dans le corps humain (.) et donc si on fait varier les conditions de**
1573 **→ l'incubateur pour ben voilà on va s'éloigner du modèle animal (.)**

1574 **[00:11:30] d'accord**

1575 **[00:11:30] ça pourrait être une raison (.) maintenant je sais pas si ça a un impact sur la**
1576 **recherche (.) sur les résultats**

1577 **[00:11:35] donc tu vas (.) ça va s'éloigner du modèle donc ça peut comment dirai-je être**
1578 **(.)**

1579 **[00:11:41] ça pourrait avoir un impact sur la transposition des résultats à l'humain (.) à**
1580 **l'humain ou à l'animal**

1581 **[00:11:49] Un impact négatif**

1582 **[00:11:51] oui (.)**

1583 **[00:11:55] Mais maintenant ce qui me (.) comme cette condition elle est centrale (.) elle**
1584 **est (.) elle se répète dans toutes les recherches ici (.) c'est pas un paramètre comme**
1585 **d'autres (.) c'est un paramètre qui est tout le temps répété dans un laboratoire comme**
1586 **ça ou tous les incubateurs sont (.) comment se fait-il qu'on ne pense jamais à ça (.) qu'on**
1587 **ne le prend pas au sérieux (.) quand je pose la question à tous vos collègues ils savent**
1588 **pas disent bon on a appris comme ça(.) je sais que on est pas supposé (.) on ne peut pas**
1589 **réfléchir à tout dans ce monde (.) en tant que chercheur ou en tant que laboratoire (.)**
1590 **mais c'est une condition centrale**

1591 **[00:12:37] Je pense qu'on y réfléchit quand il ya un problème qui se pose (.) parce que nous**
→ 1592 **(.) uh quand on a fait une culture (.) uh (.) en fait nos cellules mourraient ou elles se**
1593 **décollaient de la plaque et donc à partir du moment où il ya un souci là on recommence à y**
1594 **réfléchir (.) et là on va décortiquer vraJoannet toute la culture (.) les conditions de culture (.)**
1595 **pour voir ce qui pourrait influence influencer les cellules (.) donc je pense que quand tout va**
1596 **bien on se pose pas la question (.) et quand il ya un souci peut être que là on va réfléchir(.)**

1597 **[00:13:05] Tout va bien pour vous (.) c'est à dire tant que les cellules sont en vie et elles**
1598 **sont en reproduction ça marche**

1599 **[00:13:12] oui sans doute**

1600

1601 **GAELE 9**

1602 **00:09:58] Yes true (.) ok (.) now (.) if this is the reason why incubators are calibrated to**
1603 **5% (.) what other negative consequences that can happen to the cells on which you**
1604 **work? So you said we maintain it at 5% (.) because we want the pH level to be at 7.4(.)**
1605 **ok but if it's not the case in the body(.) co2 level is not always 5% (.) and you give to the**
1606 **cells 5% that's ok for the pH level (.) but what other negative consequences**

1607 **[00:10:44] u:::hm for the research or for the cells?**

1608 **[00:10:48] For the cells(.) for the research (.) for example**

1609 **→** [00:10:52] they cannot growth in the right way(.) uhum(.) they can have different metabolism
1610 activity for example

1611 **[00:11:12] So it can be misleading the research?**

1612 [00:11:15] Yeah (.) not may be it depends the range (.) which is changing (.) but it could yes

1613 **[00:11:29] Now knowing that usually do most of the research that you do (.) is thrown**
1614 **away (.) don't achieve right? for example you try 80% of research that don't work(.)**
1615 **and only 20% move from the in vivo(.) in vitro to in vivo (.) now the 80% of what you**
1616 **do always work under this condition 5% of co2 (.) may be because of this condition**
1617 **that the research doesn't achieve**

1618 [00:12:08] I don't understand

1619 **[00:12:09] I said most of the research that is done in this field doesn't move from in**
1620 **vitro to in vivo right?**

1621 [00:12:20] yeah

1622 **[00:12:20] Why? is this not a condition that that because it's everywhere in the research**
1623 **everywhere eon the world right? Is this not a central condition that makes research**
1624 **doesn't move to in vivo (.) because of this factor that makes the (.)**

1625 [00:12:41] No

1626 **[00:12:41] No?**

1627 [00:12:43] I don't think (.) there are too many stuff entering in

1628 **[00:12:52] ok (.) but is this a masterpiece(.) une pièce maitresse (.) right and every single**
1629 **research in your field in the whole world goes through the incubator**

1630 [00:13:09] yeah

1631 **[00:13:09] and goes through this condition (.)**

1632 [00:13:13] Yes but why are only 20% which are working? They are also in this condition

1633 **[00:13:18] and in the (.) the 20% many of them in vivo fail as well (.)right**

1634 [00:13:27] may be because the hypothesis is not right

1635 **[00:13:31] ok (.) so we're not sure (.) if it's (.) it can be? The condition or totally wrong**
1636 **what I said?**

1637 [00:13:37] It could be (.) we(.) but I'm not sure(.) uhum (.)

1638

1639 **CÉDRIC 9**

1640 **[00:12:20] Let's suppose for example the cells in the human body that you work on for**
1641 **example colon cells usually have more co2 (.) and even the pH level is higher so if**
1642 **you're giving them 5% may be this is on which you work (.) may be that is weakening**
1643 **them and they are not exactly the same as in the human body(.) so if the drug fails (.)**
1644 **doesn't work (.) so you don't even go to in vitro (.) in vivo (.) You just say ok (.) it didn't**
1645 **work (.) because of this condition (.) is this possible?**

1646 [00:12:57] yeah (.) but in a healthy human body like (.) all the cell are almost at (.) are at the
1647 right pH (.) so the 7.4 or 2 or 4 yeah (.) and then yeah the pathological cell can have really
1648 different pH (.) like in cancer and stuff like that but that for example huh you may modulate
1649 the pH in the medium to make it right by the pathology you know and on the same level of
1650 pH in vitro then you are in vivo

1651 **[00:13:45] ok (.) for you it's not an issue (.) it not worth to (.)**

1652 [00:13:49] no (.) it's just (.) for me I'd always go back to knowing what working on (.) if this
1653 go (.) is ok for your research (.) if your cell are going to grow (.) right (.) in this type of
1654 incubator (.) and if exprime (.) uh express(.) uh your right phenotype (.) there is no reason to
1655 be (.)

1656 **[00:14:21] ok (.) so as long as it's growing well so there is no problem**

1657 [00:14:28] growing well and is the right phenotype

1658 **[00:14:30] Use the right phenotype?**

1659 [00:14:32] with the right phenotype

1660 **[00:14:33] ah with (.) ok**

1661 [00:14:37] so that means they are (.) they are like they are supposed to be in life (.) because

1662 that what we were saying (.) if like you have pH7 (.) instead of having pH in the real body

1663 then of course your cell won't be in the right state

1664 **[00:14:57] that's the way to know ok**

1665 [00:14:59] so if you know that (.) then either you can change may be the co2 level in your

1666 incubator or change your medium to be at the right pH.

1667

1668 **PAUL 9**

1669 **[00:11:36] Ok (.) if this is the reason why incubators are calibrated to 5% (.) what other**

1670 **negative consequences can happen to the cells on which you work? [00:11:44]**

1671 **[00:12:06] (0.22) uh(.)** the preamble to the response is that the the the (.) to maintain the cells

1672 in culture (.) to split them to sub culture them it's a way to always have the cells always

1673 available to do one experJoannet (.) one experJoannet can be done in another context than the

1674 (.) the 5% incubation (.) so if you want to to to (.) uh to work with the cells under hypoxia or

1675 in another environments (.) uh then you may change the conditions for the (.)specifically for

1676 the moment of your experJoannet (.) this being said I think that 5% co2 is something which

1677 is part of the (.) part of a model not being perfect uh I may assume that uh that the the the co2

1678 (.) could (.) uh the co2 concentration could (.) influence the (.) could nuance the the the (.) uh

1679 the way that the tumor cells behave (.) uh if you compare them with with what it would be in

1680 the (.) in in vivo (.) in an in vivo context (.) so for me it's not contributing to a big shift in the

1681 phenot[i]pe in the phenotype (.) but the influence is that can we consider there is a minimum

1682 uh to be acceptable at

1683 **[00:14:02] Although it's a condition that is repeated everywhere(.) in every single**
1684 **research you go through the incubator and you use 5% all the time? So it's a condition**
1685 **that you use it all the time**

1686 **[00:14:12] Yes**

1687 **[00:14:13] It's not a parameter that's just for this research or that research (.) all over**
1688 **the world every single research goes through it (.) there is no doubt that this can be**
1689 **causing some sort of bias for all the research ?**

1690 **[00:14:32] Ok (.) it's it's it's minimal (.) if you if you take a chemotherapy (.) so if you take a**
1691 **drug (.) which is chemotherapy you put it on your cells in your incubator with 5% co2 you're**
1692 **going to have your cell uh your cells dying in the same way as when this chemotherapy is uh**
1693 **is administered to a patient so(.) if you take a drug which is not working uh in a in a patient**
1694 **because it does not express the right receptor against which this drug is is uh directed (.) if**
1695 **you do the same in vitro (.) in cells incubated at 5% co2 (.) the drug will not route (.) so this**
1696 **has been validated and therefore for (.) 90% 95% of the research on going this kind of model**
1697 **(.) uh with 5% co2 not reflecting the reality uhm (.) is (.) uhm can be considered as uhm as**
1698 **sufficient to to to draw a conclusion**

1699

1700 **DALILA 9**

1701 **[00:08:33] Now (.) if this is the reason (.) si c'est ça la raison why incubators are**
1702 **calibrated to 5% what are other negative consequences that can happen to the cells on**
1703 **which you work?**

1704 **[00:08:48] oui**

1705 **[00:08:48] Ok (.) on a réussi à maintenir le niveau du pH(.) ok (.) mais comme 5%**
1706 **n'est pas toujours le même taux dans le corps**

1707 **[00:08:56] oui**

1708 **[00:08:56] quelles autres conséquences négative pourraient avoir sur le corps (.) surtout**
1709 **par exemple si dans cet organe là il ya généralement 2% (.) 1% mais on donne 5%**
1710 **[00:09:10] oui**
1711 **[00:09:10] on a réussi à maintenir le pH mais quelle autres conséquences ?**
1712 **[00:09:12] ça c'est alors des artefacts dans tes dans ton études**
1713 **[00:09:17] comme quoi?**
1714 **[00:09:21] après quand tu passera (.) quand tu passera en in vivo (.) eh bienh ((noise)) ça ne**
1715 **suffira pas(.) parce que ((noise)) on se rapprochant le plus prêt de ce qui se passe dans le**
1716 **corps**
1717 **[00:09:38] tu peux répéter s'il te plait parce que le bruit du(.)**
1718 **[00:09:41] ah(.) je sais pas si (.) ça veut dire que peut être in vitro ça va fonctionner mais**
1719 **qu'in vivo pas (.) si tu étudies par exemple une molécule et que in vitro ça fonctionne parce**
1720 **que peut être le 5% de co2 a une importance mais que si tu passes dans ton foie et que t'as**
1721 **ché pas (je sais pas) moi 15% peut être que ta molécule ne fonctionnera pas**
1722 **[00:10:05] d'accord maintenant tu dis que 5% c'était important pour**
1723 **[00:10:05] Pour le pH**
1724 **[00:10:06] Pour le pH**
1725 **[00:10:06] oui**
1726 **[00:10:06] après ça peut biaiser au niveau in vitro**
1727 **[00:10:09] oui**
1728 **[00:10:11] Puisque quand tu passe à in vivo**
1729 **[00:10:12] peut être**
1730 **[00:10:12] tu vas te retrouver [**
1731 **[00:10:13] [peut être**
1732 **[00:10:13]et donc et donc**

1733 **[00:10:14]** = et c'est pour ça que dans certains laboratoires ils utilisent un incubateur qui
→
1734 n'est pas à 5% c'est parce que pour se rapprocher des conditions in vivo (.) maintenant nous
1735 ici sur les cellules cancéreuses (.) uhmm
1736 **[00:10:30]** et donc est ce que la question est importante de se poser la question pourquoi
1737 5% ?
1738 **[00:10:34]** Oui
1739 **[00:10:36]** Oui c'est important de tout savoir ((laughter))
1740 **[00:10:40]** ((laughter)) mais maintenant le fait de savoir que cette condition là (.) est
1741 partout dans toutes les recherches (.)
1742 **[00:10:50]** Je vois pas je sais pas qui l'a inventé ah
1743 **[00:07:51]** ((laughter))
1744 **[00:07:51]** ((Laughter)) () (.) je ne sais pas on a décidé que c'était 5% (.) ils ont du comparer
1745 (.) je sais pas ((laughter))
1746 **[00:11:03]** Après ça a été décidé d'après Paul et les autres même pas dans la
1747 cancérologie
1748 **[00:11:10]** Ah non c'est partout
1749 **[00:11:12]** C'est partout dans la biologie
1750 **[00:11:12]** Eh pour moi la majorité (.) 95% des gens qui font de la culture cellulaire sont à
1751 **[00:11:20]** D'accord
1752 **[00:11:20]** Sont à (.) et Paul sait d'où ça vient ?
1753 **[00:11:21]** Non il a dit ça date depuis à peu près 50 ans (.) mais il sait pas d'où
1754 exactement ça vient (.) uhm (.) voilà c'est une pratique qui est là
1755 **[00:11:32]** Oui
1756 **[00:11:33]** mais qui est là même avant les études de cancer
1757 **[00:11:34]** Oui oui

1758 **[00:11:34] Sur le cancer**

1759 **[00:11:35] C'est partout**

1760 **[00:11:38] Et donc est ce que (.) donc elle a été peut être confirmé par rapport au uhm**

1761 **au pH ça c'est claire (.) mais par rapport à d'autres variables on sait pas**

1762 **[00:11:50] Après quand tu fais la recherche c'est bien d'avoir aussi quelque chose qui est**

1763 **uhm(.) qui est fixe pour la majorité des labos en Belgique ou même dans le monde parce que**

1764 **sinon après on s'en sort plus**

1765 **[00:12:02] ah mais ((inaudible/overlap)) (.) J'ai un problème avec fixe (.) fixe on le fait**

1766 **juste quand on veut reproduire on va reproduire a même chose pour voir est ce que ça a**

1767 **fonctionné (.) ça c'est claire par contre si on sait que ça peut poser un problème et on va**

1768 **standardiser qui est encore point d'interrogation ça c'est un problème aussi (.) enfin**

1769 **[00:12:30] Oui mais à un moment il faut partir sur quelque chose parce que si tu dois étudier**

1770 **ton ta concentration co2 (.) faire tes cellules avec du 5 7 (.) 5 10 12 (.) 5 15 et puis encore**

1771 **jouer sur la température sur machin (.) tu t'en sors pas**

1772 **[00:12:46] Non c'est claire c'est claire que une personne un chercheur ou un seul**

1773 **laboratoire ne peut pas tout faire ou tout commencer ça c'est claire**

1774 **[00:12:53] Oui**

1775 **[00:12:53] Mais je parle maintenant au moins**

1776 **[00:12:56] Il ya peut être des labos où ils regardent des pourcentages avec le co2 (.) je ne sais**

1777 **pas**

1778 **[00:12:59] J'ai cherché partout mais j'ai pas trouvé ah (.) j'ai déjà demandé à tout le**

1779 **monde ici**

1780 **[00:13:08] Ah oui bien sur**

1781 **[00:13:08] Mais voilà donc euh (.) maintenant donc voilà on revient à la même question**

1782 **donc au départ c'était une question qui a été trivialisée on se demande pas (.) et tu me**

1783 **dis maintenant que ça pourrait jouer sur le résultat dans le passage (.) et donc à la fin**
1784 **est ce que tu changes d'avis c'est important tu trouves comme question ou c'est pas**
1785 **important toujours ?**

1786 **[00:13:34]** Après je pense qu'il faut se mettre (.) ce fixer sur quelque chose (.) après on teste
1787 quand même de toutes façons (.) sur euh sur la souris donc euh (.) si ça fonctionne pas et ben
1788 peut etre mais c'est parce que que 5% co2 mais si ça fonctionne uh de toutes façons

1789 **[00:13:57]** D'accord (.) est ce que le 5% si c'est pas vraJoannet le niveau idéal est ce que
1790 ça peut changer le phénotype de la cellule sur laquelle on travaille in vitro?

1791 **[00:14:10]** Je sais pas

1792 **[00:14:10]** tu sais pas

1793

1794 **MARIE 9**

1795 **[00:06:04]** ah d'accord ok ok (.) so if this is a reason why incubators are calibrated to
1796 5% what other negative consequences that can happen to the cells on which you work?
1797 donc si c'est pour maintenir le niveau du pH ça d'accord on a réussi à maintenir le
1798 niveau du pH(.) il faut 5% pour le maintenir mais quelles sot les autres conséquences
1799 négatives (.) quelles conséquences ça pourrait avoir sur les cellules (.) si les 5% ne sont
1800 pas réellement dans le corps humain (.)uhm le corps humain c'est pas vraJoannet à
1801 5%?

1802 **[00:06:46]** Je sais pas (.) c'était pas la question hier ((the previous day we did the same
1803 interview (.) and we had to redo it (.) because we had problems in the recording (.) so she is
1804 now puzzled that this question is different from that of the previous day))

1805 **[00:06:50]** c'était pas la même chose? ((laughter))

1806 **[00:06:52]** c'est pas totalement la même chose

1807 **[00:06:54]** Mais tu comprends vraJoannet la question? Je peux répéter ah

1808 [00:06:55] oui (.) oui tout à fait (.) en fin c'était plus claire (.)

1809 **[00:07:01] je peux répéter alors (.) alors (.) en sachant (.) tel que tu dis (.) en sachant**

1810 **que le corps humain n'est pas toujours à 5% de co2 (.) mais c'est incubateurs sont**

1811 **réglés à 5% pour maintenir un niveau de pH (.) ça d'accord (.) mais quelles sont les**

1812 **autres conséquences négatives sur ces cellules si on leur donne 5% de co2 alors que**

1813 **c'est pas vraJoannet la condition dans le corps humain?**

1814 → [00:07:25] uhm (.) voilà par exemple on disait que si le pH change les cellules (.) je sais pas

1815 (.) si le co2 (.) si le pH change dans le milieu de la cellule (.) là maintenant peuvent changer

1816 de phénotype (.) elles peuvent se modifier (.)

1817 **[00:07:50] phénotypes (.) se modifier (.) peux tu expliquer un peu plus? la gravité par**

1818 **exemple (.) combien c'est grave? combien c'est sérieux? combien ça joue?**

1819 → [00:08:04] non ça je ne sais pas vraJoannet dire (.) parce que ça peut être aussi une expression

1820 d'une protéine ou l'extinction d'une protéine (.) on sait pas dire exactement jusqu'où (.) s'il ya

1821 mutation génétique et cetera (.)

1822 **[00:08:19] et donc ça joue sur le résultat de la recherche?**

1823 → [00:08:24] oui ça pourrait jouer

1824 **[00:08:29] hum (.) d'accord**

1825 [00:08:31] encore une fois (.) uhm voilà ces cellules sont isolées ce que je disais (.) isolées (.)

1826 donc (.) si jamais que c'est pas réellement in vivo quoi (.) c'est pas (.) dans un corps humain

1827 coincées (.)

1828 **[00:08:43] oui oui oui (.) je parle pas (.) bien sur on parle par rapport au**

1829 **à l'expérience pas au corps humain bien sur (.)**

1830

1831 **IJ JOANNE 9**

1832 **[00:11:52] ok (.) if what I said is true(.) that means the reasons why the incubators are**
1833 **calibrated to 5% is because to maintain the pH level at 7.4 (.) what are negative**
1834 **consequences that can happen to the cells on which you work? for example now (.) you**
1835 **answered part of the question you said that if it's 5% it maintains 7.4 of pH (.) then it**
1836 **would be negative if we want to maintain the 6.5 for example (.) that's partly (.) but let**
1837 **me ask you again the question and I want you to think about other negative**
1838 **consequences; if this is the reasons what incubators are calibrated to 5% (.) what other**
1839 **negative consequences that can happen to the cells on which you work?**

1840 [00:12:47] uhm (.) like may me ((laughter)) I don't know (.) like may be other things would
1841 happen inside the cells if we maintain the co2 at 5% like another pathways will be active or
1842 something like that (.) it depends on the cells if they are really inside the human body in other
1843 conditions so may be other things will happen and we won't really know about it(.) and the
1844 effects we may see later (.) it will be the reason (.) like why consequences of putting cells on
1845 5% co2 (.)

1846 **[00:13:37] Would (.) could this be related to resistance? Why cells resist drugs? And**
1847 **resist (.) because the conditions are not the same like in the human body (.) if you're**
1848 **giving 5% co2 (.) then maybe you're changing other parameters of the cell (.) so may**
1849 **be that would make the cell more resistant and then you would say ok (.) this drug**
1850 **doesn't work(.) You through it now and move on to something else(.) so you can of miss**
1851 **uhm findings**

1852 [00:14:17] Yes (.) but sometimes (.) there is the in vivo experJoannet

1853 **[00:14:25] But you don't go to in vivo unless you succeed the in vitro**

1854 [00:14:28] Yes (.) that's right (.) yes may be ((laughter)).

B2. Collective interview (case 1)

1855

1856 1:22 **Why is the incubator regulated at the level of 5% co2 (.) according to you for**
1857 **example ((addressing Stephan))?**

1858 1:29 ((Stephan)) oh the 5% co2 ? u:hm (.) I think that is uh going to give the equilibrium (.)
1859 of the co2 () levels that is comparable to what is happening (.) in vivo (.) it's also u:h causing
1860 u:h this balance equilibrium in the pH and (0.2)

1861 1:54 **ok (.) do you agree? ((Addressing the question to Gaelle))**

1862 1:56 ((Gaelle)) Yes ((laughter))

1863 1:57 **((everyone laughing)) (.) totally agree?**

1864 2:00 ((Gaelle)) Yes

1865 2:01 **Ok how about you ((talking to Brian))**

1866 2:03 ((Brian)) Yeah

1867 2:03 ((Daniel)) yeah there is a main u::h (.) the main reason it's for the pH actually

1868 2:09 **ok (.) because when I first asked the question uh here in the lab (.) the first day**
1869 **when I asked uh everybody was surprised by the question (.) I remember Lucie the the**
1870 **doctor (.) yeah she was totally surprised she said we don't know but we don't know why**
1871 **we don't know this (.) I said you have so many things you cannot know every single**
1872 **thing I mean for sure everyone is focused on his or her research so you can't (.) and she**
1873 **said no but this is a central uh a central factor that all research goes through any**
1874 **research goes through this so we need to know why (.) and then the next day u::h**
1875 **everyone said that this is related to Phd and it's important for the::: sorry the pH (.) so**
1876 **it's important for our pH (.) but then the problem is that (0.3) now the answer that I**
1877 **have incubators are regulated at 5% co2 because this is how the desired pH level can be**
1878 **maintained**

1879 3:18 ((Stephan)) Yeah
1880 3:18 ((Gaelle)) uhum
1881 3:19 **Is it correct?**
1882 3:21 ((Gaelle)) uhum ((Brian)) yes
1883 3:22 **Totally correct or half half or how?**
1884 3:25 ((Stephan)) Well it's interplay you you also have like chemical agent in your liquid (.) in
1885 your
1886 3:31 **ok we'll come to that (.) but now the main issue is that some said the desired level of**
1887 **the pH and some said we need to get it at 7.4 (.) so is it for 7.4 or for any level that you**
1888 **want of pH?**
1889 3:55 ((Brian)) It keeps the pH (.) stable and you use a bicarbonate buffer (.) if you use as this
1890 it doesn't get (.) but I think is at the beginning they did it because of that and: like a
1891 compromise to give the values
1892 4:10 **but why some people said [**
1893 4:11 ((Brian)) [If you use bicarbonate buffer you need this uh this this 5% co2 otherwise it
1894 will become acidic or basic
1895 4:20 **ok why some people told me that we need 5% because we need a physiological pH**
1896 **which is 7.4 (.) and kept repeating it many times (.) and some right from the beginning**
1897 **said because it helps keeping the pH stable not necessarily at 7.4?**
1898 4:46 ((Stephan)) I think it's [
1899 4:47 ((Brian)) [to keep it at 7.4
1900 4:49 **((talking to Brian)) oh you think it's to keep it at 7.4?**
1901 4:52 ((Brian)) yeah
1902 4:54 ((Daniel)) this is a standard uh that uh culture condition [
1903 4:57 ((Brian)) yes yeah

1904 4:57 ((Stephan)) and otherwise I think because if you have like a medium that is different (.)
1905 different pH (.) you make your buffer in such a way that this is (.) in the same (.) and it's also
1906 stable (.) so it might be that in your liquid composition it's different but at the end because of
1907 this 5% it's still also the one you want
1908 5:20 **ok but this 5% is specifically for 7.4 pH?**
1909 5:26 ((Brian)) Yes
1910 5:27 **Yes?**
1911 5:28 ((Brian)) and bicarbonate uh buffer
1912 5:32 **if you add?**
1913 5:34 ((Ada)) yeah if you don't have it will change the
1914 5:36 ((Daniel)) Yeah two conditions which are associated the 5% co₂ in the incubator and
1915 the concentration of bicarbonate in you medium (.)
1916 5:45 ((Brian whispering)) exactly
1917 5:45 so because the:: industry controls the percentage of co₂ we know which concentration
1918 of bicarbonate we need to add in our medium (.) it's a way to change only one::: one thing in
1919 the medium (.) we know that the co₂ is set up at 5 % and then if you want to change the pH
1920 in the medium you'll have to change to change only the:: bicarbonate
1921 6:14 **so if if you work on cells that are supposed to be at 6.5 of pH for example (.) what**
1922 **do you do?**
1923 6:23 ((Gaelle)) you use the buffer
1924 6:23 ((Daniel)) we change the yeah we change the the composition uh composition of the
1925 medium
1926 6:28 **so you keep the 5%?**
1927 6:30 ((Stephan)) Yes
1928 6:30 **and you play on the buffer?**

1929 6:33 ((Daniel)) and we buffer the (.) yeah the medium

1930 6:37 **How can you be sure that the 5% co2 is also good for the 6.5 pH?**

1931 6:43 ((Brian)) ((laughing))

1932 6:42 ((Gaelle)) >because you can change the pH after and you are still at 6.5 [

1933 6:46 ((Brian)) >Yeah but the pH will be the same but the percentage of co2 you don't know

1934 if it's the good one but normally it should be [

1935 6:54 ((Daniel))> [yeah but at the end you will have 5% co2 for your cells you're keeping at

1936 pH 7.4 and 5% co2 for the cells you are maintaining at pH 6.5 so at the end the percentage of

1937 co2 [<

1938 7:07 ((Brian)) > it's stable [<

1939 7:07 ((Daniel)) = will be the same (.) just the pH which is uh (.) you change it [

1940 7:14 ((Stephan)) you have you make it more constant so don't have to waste [

1941 7:18 ((Brian)) otherwise you have too many [

1942 7:18((Stephan)) ↑ [OTHERWISE you have you need 20 incubators if you have all these

1943 different cultures (0.2)

1944 7:27 ((Gaelle)) <and you're control (.) are controlling the same condition (.) apart the this the

1945 thing that you change (.) the pH >

1946 7:36 **So are there other ways to maintain the pH level at the desired level or you only**

1947 **need to work with 5%?**

1948 7:45 ((Gaelle)) No there is also the other:: type of u:h buffer

1949 7:49 ((Brian)) ↓ excatly if it's (.) with the you have fix with the [

1950 7:54 ((Daniel)) [It depend of the co2

1951 7:56 ((Brian)) co2 yeah

1952 8:00 ((Gaelle)) but you use the the media that we use are based on bicarbonate and that's why

1953 you use 5% of co2 in the incubator

1954 8:08 **Ok I'll come to that because I heard this from Paul first time and uh he was the**
1955 **only one who told me this before u::hm (.) What do you think about this question that**
1956 **I'm asking again and again u:h do you think that re-questionning or rethinking about**
1957 **the 5% level is important for cancer research or it does not have any importance?**
1958 8:32 ((Brian)) Yes of course (.) the pH is important so (.) probably because of this addition (.)
1959 it's important
1960 8:38 ((Daniel)) for me (.) I agree that pH is important but I will not (0.3) [
1961 8:49 ((Stephan)) It's good to question your experJoannetal conditions (.) it's also what you do
1962 (.) it's
1963 8:57 ((Brian)) and you need to know why 5%
1964 8:57 ((Stephan)) You need to know why this is actually the right condition for what I'm
1965 studying (.) it's good to think about it so
1966 9:08 **You said you need to know but but I mean do you know for sure that co2 can**
1967 **change results? The level can change results?**
1968 9:17 ((Stephan)) ↑ Oh yeah
1969 9:19 ((addressing the question to Brian)) it can?
1970 9:19 "Yes"
1971 9:19 **so if you're standardizing a condition for any research and you think of it like**
1972 **something that is standard so for every single research that you do (.) you meticulously**
1973 **think it you scrutinize it you think about to design it and you go to your protocols and**
1974 **you think a lot but these things are forgotten are completely uh I don't think some**
1975 **people would say no I'm going to my research with another level (.) because these are**
1976 9:47 ((Brian)) I think there are labs doing tests
1977 9:49 ((Stephan)) Yes
1978 9:50 ((Brian)) I think there are labs doing these

1979 9:51 **Doing what? They are particularly working on**
1980 9:54 ((Brian)) the co2 concentration for sure
1981 9:57 **Yeah but they're working on that**
1982 9:59 ((Brian)) Yes
1983 9:59 **so that's their their their u::h topic (.) that's their aim**
1984 10:05 ((Brian)) Yeah
1985 10:05 **But apart from those who work on that aim (.) why these things are not**
1986 **questioned like they are left aside and people thinking about every single thing but not**
1987 **about these things that are getting repeated all the time everywhere? Why**
1988 **standardizing a condition that you are saying it can change the results?**
1989 10:31 ((Gaelle)) because you can't work on everything then you need to focus on one thing (.)
1990 to really (.) to see u:h the effect of that condition (.) you cannot take into account all (.)
1991 everything
1992 10:46 ((Brian)) all the parameters you will have here in the lab
1993 10:50 ((Gaelle)) and you will not advance in (.) and after in vitro you can test in vivo (.) and
1994 you::
1995 10:59 ((Brian)) you can validate your [
1996 11:00 ((Gaelle)) [you're results
1997 11:00 ((Brian)) = findings
1998 11:02 **I will come to this idea of you know (.) you need to have something fixed here and**
1999 **not play with everything because if you play with everything you will be lost**
2000 11:12 ((Gaelle)) Yeah
2001 11:13 ((Brian)) Yeah you'll be lost
2002 11:14 = **that I understand**

2003 11:15 ((Daniel)) it's also a way to be able to compare (.) our results with the results of another
2004 lab or (.) We need to: to work with uh
2005 11:22 ((Gaelle)) ()
2006 11:22 ((Daniel)) = almost the same conditions
2007 11:25 **Yeah but again I will come to this idea because why? (.) people who need to**
2008 **replicate your research (.) they would look at your research protocol and see what what**
2009 **level you used and replicate it (.) not necessarily 5% (.) particularly if you think that the**
2010 **type of cells that you work on don't have 5% (.) so why necessarily use 5% when you**
2011 **think that these cells need 2% for example?**
2012 11:50 ((Daniel)) you need to use [
2013 11:54 ((Brian)) then you use 2%
2014 11:55 **So it's not necessarily (.) you don't necessarily need to follow these things**
2015 12:00 ((Brian)) No
2016 12:00 ((Gaelle)) No
2017 12:01 ((Brian)) it's like we're working with different pH ()
2018 12:06 ((Stephan)) with different oxygen level or
2019 12:09 ((overlap all speaking at the same time)) ()
2020 12:09 ((Brian)) oxygen concentration
2021 12:11 ((Daniel)) or composition
2022 12:12 ((Brian)) yeah
2023 12:13 **but you don't change the level of the co2**
2024 12:15 ((Daniel)) no because we cannot change
2025 12:17 ((Brian)) when change ((laughter))
2026 12:22 **ok but anytime (.) does it change? it never changed here no?**
2027 12:27 ((Brian)) no I think never

2028 12:29 **so not just (.) so every time it's 5%?**

2029 12:33 ((Daniel)) yeah it's also because (.) ok it could be interesting to change u::h co2
2030 concentration but it means that you will keep one incubator for your experJoannet because
2031 you'll change the co2 (.) and we're not only one to use the incubator (.) we share the
2032 incubators so (.) we need to keep it at 5% co2 so::: we cannot change like that [
2033 13:04 ((Gaelle)) [but for sure there are study before may be like u::h fifty I don't know one
2034 hundred years ago that said that 5% co2 it was necessary to maintain the: the pH at 7.4
2035 13:17 **How do you know for sure?**

2036 13:20 ((Gaelle)) because you cannot say ok now we will put the incubator at 5% co2 and you
2037 give uh good results

2038 13:27 **but uh**

2039 13:27 ((Gaelle)) it like for the composition of medium they did like experJoannet to see the
2040 good u::h concentration of amino acids vitamins and so on to maintain uh cell uh

2041 13:41 **but nobody was able to tell me where I can I find (.) where this**

2042 13:45 ((Stephan)) but there is a lot of stuff

2043 13:47 ((Gaelle)) Yes

2044 13:47 → ((Stephan)) = you're continuing on existent knowledge that has been validated

2045 13:52 ((Brian)) you cannot read everything

2046 13:53 ((Stephan)) and if you want to continue and expand (.) do new findings you have to
2047 start with (.) some part of existing knowledge to continue from this point

2048 14:04 **ok (.) ok (.) is the 5% level the same condition in the human body? or it varies**
2049 **greatly?**

2050 14:14 ((Gaelle)) it's more like the pH (.) it's point of view

2051 14:18 **sorry?**

2052 14:19 ((Gaelle)) for me it's like a point of view about pH (.) it's like in the human body for
2053 example the blood normally the pH is around 7.4 (.) it's more for:: that level

2054 14:33 **yeah but the co2 in itself itself apart from the pH does it vary?**

2055 14:40 ((Brian)) Yeah of course

2056 14:41 ((Stephan)) it varies (.) in the body if you're getting closer to the lungs or inside it's

2057 14:45 ((Daniel)) it's fluctuating

2058 14:46 ((Stephan)) it's fluctuating yeah (.) like graded yeah

2059 14:50 ((Brian)) Yeah exactly

2060 14:51 **ok but u:h I mean uh considering that this condition is not the same in the human**
2061 **body are there other negative consequences with maintaining the level at 5%? Apart**
2062 **from apart from the pH level (.) let's leave the pH level now aside**

2063 15:10 ((Brian)) yeah sure (.) I'm sure of that

2064 15:12 ((Daniel)) but we could

2065 15:13 **sure of what?**

2066 15:14 ((Brian)) that there are some genes that responding to this concentration of co2 for
2067 sure [

2068 15:20 ((Daniel)) [but we could discuss about that for:: culture conditions

2069 15:25 ((Gaelle)) like the ss

2070 15:25 ((Daniel)) like the minimal of glucose will probably not we:: find in the tumor

2071 15:30→ **Yeah but let's keep talking about this in particular**

2072 15:33 ((everyone laughed at once))

2073 15:36 **because it's even more complicated (.) this in particular (.) what what kind of**
2074 **consequences it can have?**

2075 15:41 ((Gaelle)) but you have the control condition the condition that your experJoannet (.)
2076 so:: the two conditions are exposed to the same level of co2

2077 15:53 **I did not get the point**

2078 15:54 ((Gaelle)) Like when you try to for example if you try a: different vitamin
2079 concentration in your cells you'll have like a control condition and a treated condition (.) both
2080 are exposed to the same level of co2

2081 16:09 **yes**

2082 16:10 ((Brian)) yeah but

2083 16:10 **So what?**

2084 16:10 ((Brian)) It could be masking may be if you do a less co2 percentage you will see
2085 difference but at the same co2 percentage (.) at 5% you don't see difference

2086 16:20 ((Gaelle)) yes but me I don't want to see the effect of co2 (.) I just want to see the
2087 effect

2088 16:25 ((Stephan)) ah but

2089 16:25 ((Brian)) yes but

2090 16:26 ((Daniel)) no but

2091 16:27 ((Brian)) it has an effect

2092 16:29 ((Stephan)) exactly

2093 16:29 **now maybe**

2094 16:31 ((Stephan)) it's it's it's (.) you have to make a calculated risk more or less that you make
2095 (.) it's like a risk (.) you take a gamble

2096 16:39 **ok may be maybe there is a discrepancy between you and I (.) you always answer**
2097 **in terms of you (.) I know as a person you can never ever you know play on everything**
2098 **(.) it's not about you as a person I'm talking about the condition the situation or**
2099 **research how it is going but not not necessarily about one person that this person needs**
2100 **to check everything (.) even our research we cannot check everything (.) but as a**
2101 **principle this 5% can it have does it have other complications or (.) apart from the pH?**

- 2102 17:15 ((Gaelle)) Yeah sure
- 2103 17:15 ((Stephan)) sure
- 2104 17:16 ((Brian)) I think it's better
- 2105 17:19 **like this?**
- 2106 17:19 ((Brian)) Yeah it's good
- 2107 17:20 **why for example can you give me examples on what kind of negative**
- 2108 **consequences it can have?**
- 2109 17:28 ((Brian)) Yeah the thing I understood that probably you have two conditions but
- 2110 depending on the level of co2 you will see difference or not (.) between the two conditions
- 2111 17:41 **ok how about you ((addressing the question to Daniel))?**
- 2112 17:41 ((Daniel)) Yeah if we could consider that uh the concentration of co2 could have affect
- 2113 the way the cells can u::h respire because they produce co2 when they're respiring so if
- 2114 we increase the co2 concentration in their medium at least they'll start to produce co2 (.) so
- 2115 you change a bit the phenotype of your of your cells (.) if you decrease the concentration in
- 2116 the incubator you will force the cells to produce co2 so yeah for sure
- 2117 18:16 **and for example the other time you mentioned that when you work on a**
- 2118 **particular therapy may be the cells with this co2 level it will develop like resistance or**
- 2119 **adapt to this condition so when you test the drug the drug does not respond and then**
- 2120 **you move to in vitro (.) or the opposite may be it responds here doesn't respond in vivo**
- 2121 **is this also true?**
- 2122 18:47 ((Daniel)) could be true for the co2 but it's not the only reason (.) it's not working in
- 2123 vitro or in vivo (.) could be the pH could be
- 2124 18:58 **Yeah but but for the co2 ((laughing)) in particular**
- 2125 19:02 ((Daniel)) I know you're talking about co2 but it's a bit uh restrictive
- 2126 19:06 **so it's a condition that can change the the how cells behave?**

2127 19:10 ((Stephan)) Yeah

2128 19:10 ((Daniel)) Yeah

2129 19:11 ((Gaelle)) yes

2130 19:11 ((Brian)) of course

2131 19:14 **so apart from you as a person (.) this condition for research in general is it not**
2132 **skewing constantly skewing the research? not as a person I'm not talking about you as a**
2133 **person but as a condition**

2134 19:29 ((Brian)) Yeah

2135 19:29 ((Stephan)) I think to some degree it does (.) because there are for sure there are groups
2136 they're like we have to culture we must just replicate standards and look and may be they're
2137 not critically thinking over if it's the good condition for them (.) so yeah well then you're
2138 already biased from the start to your research is already aiming in a certain way maybe that
2139 could have been different indeed it would have an effect of co2 or not

2140 20:00 **so again about research not about a researcher or a particular person or lab why**
2141 **do these research going this why why do we need to standardize a condition that you say**
2142 **is not necessarily appropriate to all cases and u:h even if you as a person now think that**
2143 **it can skew research but why like the whole body of research in oncology does not (.)**
2144 **there is no one who is considering how (.) you know culture itself like a condition that is**
2145 **there (.) people are working on so many things scrutinizing every single thing but they**
2146 **are standing on something that is already skewing the totality of research (.) what do**
2147 **you think about this situation?**

2148 20:53 ((Brian)) why you think it's like that?

2149 20:57 **I'm saying that if this condition is used everywhere (.) so nobody is working on it**
2150 **unless it's the topic of your research (.) people keep working on so many things but they**

2151 **are standing on this standard (.) like ok this is a standard we don't question it unless**
2152 **this is my topic and you're saying that it can skew the totality of research**

2153 21:23 ((Stephan)) yeah (.) I think you're (.) in your study if you have to work from a starting
2154 point then you based on some model and this just part of this model (.) part of the conditions
2155 (.) and if you look at like the key identifiers that you know or at least expect to be changing
2156 or not (.) as long as you can see this effect (.) it can be enough and only if you suspect (.) may
2157 be there is a role of co2 or something (.) that you would take it into the:: consideration but
2158 otherwise you just focus on this part and you have to accept limitation [

2159 22:01 ((Brian)) [and you need to standardize because when you go to a lab in another place
2160 the co2 concentration will be different then you have the right buffer and then the right pH
2161 (.) it's also a way to give constant

2162 22:16 **so you move to another lab and it's different so what's the problem?**

2163 22:21 ((Brian)) You always need to control the levels of co2 (.) so if the is the level that
2164 makes the pH to stay at a physiological level is like a compromise for everyone

2165 22:37 ((Gaelle)) but you could do for example (.) like a in at () I don't know the source of
2166 u:h

2167 22:49 ((Brian)) you have to control these parameters

2168 22:51 ((Stephan)) you want to be able to compare your results to other results anywhere in
2169 the world and this is one way to standardize

2170 23:00 ((Brian)) < but we agree that it could make a difference if you play with it like oxygen
2171 (.) we have also hypoxia standard to to have different oxygen concentration (.) but in all the
2172 labs they work with 20% oxygen >

2173 23:20 **the only thing that I can't understand is how we standardize something that is**
2174 **already problematic still just ok we want (.) because you want to replicate so you need**

2175 **to keep this in order to be sure that we're duplicating the same thing (.) but at the same**
2176 **time you're saying it's problematic it can change results (.) this is [**
2177 23:44 → ((Stephan)) I think you can still address the question that you have (.) even just
2178 accepting that you have some parts that you don't know but at least the question (.) you:: you
2179 can do some your findings or new data or research done (.) so may be to address the same
2180 question that you have it's sufficient to find something (.) may be you'll find additional stuff
2181 (.) if you would change this parameter but you cannot change everything (.) otherwise it's like
2182 millions of parameters that you have to change then then you're never (.) you have to accept
2183 some lack of
2184 24:24 ((Daniel)) at the end we need to validate u:h in vivo model (.) just to be sure that we
2185 work with this in vitro conditions (.) we're going to repeat in uh in vivo (.) we know at (.) at
2186 the beginning that in vitro condition are not the best (.) but we need to:: to start with
2187 something and
2188 24:51 ((Stephan)) and validate it in th
2189 24:52 ((Gaelle)) because
2190 24:53 ((Stephan)) in vivo
2191 24:55 ((Gaelle)) even in vitro only one type of cells but in human body you have so many
2192 type of cells (.) but you have to start with something before to go further (.)
2193 25:06 **so from your responses I understand I understand that in principle you agree that**
2194 **the co2 level can change (.) but because you cannot do elsewhere (.) the the the that's**
2195 **how you can do (.) it's not possible (.) it's a matter of possibility or feasibility**
2196 25:27 ((Brian)) [you can do but u:h but we don't want to explore this uh effect (.) we just
2197 want to explore different (.) because you need to change temperature o2 (.) co2 (.) pH (.)
2198 density (.) or the plastic composition

2199 25:49 **but but in your research protocols you address these things anyway (.) so you say**
2200 **I have this level of whatever this this this (.) you go through them anyway these**
2201 **parameters (.) so**
2202 25:59 ((Stephan)) Yeah but unlimited
2203 26:00 ((Brian)) not all
2204 26:02 ((Gaelle)) it's stan(.) it's basic stuff (.) in fact it's standardized condition (.) and after
2205 you change some condition in which you are interested
2206 26:14 Ok (.) **so so you you:: you trust these conditions you don't want to address them**
2207 **and you keep going all the time**
2208 26:20 ((Gaelle)) it's not that we don't want to address (.) it's just that (.) it's standardized and
2209 we're for the moment not interested in that condition
2210 26:33 **ok (.) some said that because we need to uh replicate some experJoannets it is**
2211 **good to have something in common like 5% co2 but if we replicate experJoannets you**
2212 **just follow (.) sorry we already talked about this (.) but according to Paul (.) the 5%**
2213 **level is dictated by the medium that is available commercially (.) that's what he said so**
2214 **there is a commercial**
2215 27:00 ((Brian)) it is not dictated
2216 27:03 **He said dictated by the medium (.) so those who manufactured (.) produced the**
2217 **medium said that we need 5% for this and from that that point it started to become like**
2218 **uh**
2219 27:18 ((Brian)) yeah it was initially like that
2220 27:19 ((Daniel)) Yeah I will not say dictated (.) you can still adapt if you want (.) it's not just
2221 27:28 **No he meant initially**
2222 27:29 ((Brian)) initially yeah

- 2223 27:30 = **initially dictated (.) it means that those who (.) we were talking historically how**
2224 **it started (.) it started he said because those who produced (.) the producers the**
2225 **providers professionals (.) who produced the medium (.) said ok we need 5% (.) and**
2226 **from there it started**
- 2227 27:47 ((Brian)) Yeah we agree
- 2228 27:49 ((Gaelle)) uhum
- 2229 27:49 ((Stephan)) Yeah we agree with that
- 2230 27:50 **so what do you think about this idea? If you agree to this condition (.) what's your**
2231 **uh reaction to this?**
- 2232 28:00 ((all spoke at once inaudible)) ((laughter))
- 2233 28:04 ((Stephan)) If you have knowledge people studying at 7.4 then this is working in that
2234 sense (.) it's a choice that was made somehow
- 2235 28:12 ((Gaelle)) it's like when you say to:: start (.) not to start (.) to start like u:h a car you
2236 have to push on the accelerator to: to move
- 2237 28:22 ((Stephan)) Yeah
- 2238 28:24 **But I mean uh I'm talking about**
- 2239 28:26 ((Brian)) you could have in the other side if you want
- 2240 28:28 **sorry?**
- 2241 28:29 ((Brian)) You could have it on the other leg if you want ((laughter))
- 2242 28:31 sorry? **I did not get your point**
- 2243 28:33 ((Brian)) the pedals
- 2244 28:33 **ah ok**
- 2245 28:34 = yeah you can put in different leg your ((laughter))
- 2246 28:36 ((Stephan)) to some point you make an agreement
- 2247 28:37 ((Brian)) but you say ok (.) we will have it on the right

2248 28:41 **but what I meant is that this this level came from the commerce from the**
2249 **providers not from research**

2250 28:50 ↑ ((all spoke at the same time)) ((inaudible))

2251 28:52 ((Stephan)) it's it's it an interplay () if research don't buy it

2252 28:54 ((Gaelle))

2253 28:54 ((Stephan)) they can produce but nobody buys

2254 28:56 **but researchers cannot not buy you need it**

2255 29:00 ((Stephan)) I think the researchers were like ah we need something for 7.4

2256 29:04 ((Gaelle)) in the beginning of u:h a manufacture (.) they've always researchers

2257 29:07 ((Daniel)) Yeah yeah yeah

2258 29:09 **They also do (.) but they are profit driven (.)**

2259 29:12 ((Stephan)) Yeah

2260 29:13 **they would**

2261 29:14 ((Gaelle)) Yes but

2262 29:15 ((Stephan)) Because there is a request for something that is keeping things at 7.4 (.) so
2263 they make it (.) and they sell it (.) so it's like (.) it's way

2264 29:25 **no this is not what I meant actually (.) ok the the researchers need a medium that**
2265 **keep at 7.4**

2266 29:32 ((Gaelle)) Yeah

2267 29:32 **and the provider does this (.) but with this condition (.) ok I will enable you to**
2268 **keep (.) to use this medium to be able to keep the cells at 7.4 but be careful you have to**
2269 **use 5% co2 (.) but this is like**

2270 29:47 ((Stephan)) I just I just

2271 29:50 they cannot say be careful because the scientists develop this 5% this condition with
2272 5% co2

2273 29:55 **ok**

2274 29:56 ((Brian)) it's not like the company said no no you have to use 5% (.) the scientists

2275 found that 5% co₂ with this bicarbonate composition leads to pH 7.4 (.) so the company

2276 created this medium to supply

2277 30:10 **ok I'll put my question in a different way (.)**

2278 30:12 ((Brian)) ((laughter))

2279 30:12 **do you think that the company which uses scientists and researchers as well to**

2280 **develop and manufacture that (.) would think more about drawbacks the negative**

2281 **consequences about the 5% or of its own profitability (.) for example if they would find**

2282 **that that this level of 5% can have negative consequences (.) may be they will not say (.)**

2283 **they will say ok you want 7.4 pH? there you go (.) this is the medium that you want and**

2284 **they will not tell you what they do**

2285 30:46 ((Daniel)) but why they would 5% is not good for

2286 30:51 **like you said not me**

2287 30:53 ((inaudible))

2288 30:53 ((Stephan)) ↑ and it's a question of practicality also you have like the environmental

2289 atmosphere (.) most of it is nitrogen well nitrogen does not (.) change much it's less (.) it's

2290 less reactive than co₂ you don't want to be pumping pure oxygen because of then you spend

2291 on co₂ (.) relatively it is effective and it's less dangerous to pump these concentrations so

2292 because also practical (.) I think when they choose ok let's use co₂ (.) something (.) relatively

2293 comparable to environmental and 5% it's (.) something to do (.) I think it's it's because also

2294 like really what research wanted practicality and it was historically somebody arrived at this

2295 and then people say HEY what your (.) nice it's easy let (.) I'll also do it I'll also do it and you

2296 get a market and then produce and then everybody uses it

2297 31:55 **ok (.) any one wants to add something? (0.3) ok we'll move now to the to the**
2298 **medium ((end of interview))**

Appendix C

Interviews transcriptions

Case2: How appropriate is the medium usage?

C1. Individual interviews (case 2)

10. Why are the cells constantly in the medium and not exposed to it like take nutrients?

STEPHAN 10

2299 26:05 **why are the cells constantly in the medium and not exposed to it like take**
2300 **nutrients? like from time to time [**

2301 26:14 from time to time yeah like:: u::h (.) well it's it's it's a practical issue like you can (.)
2302 provide both continuous flow of nutrients and remove the waste products but that requires
2303 like very special equipment and more complex systems to be set up and that will be (.) much
2304 more time consuming and costly in running and less practical than the system what we use
2305 now (.) so it's just a matter of choice for the practicality

2306 26:53 **if you had the choice or the feasibility you would go for it?**

2307 26:58 well yeah this is like if it's (.) if it's possible and we have () it's I think it would be u:h
2308 a great thing to do (.)

2309

2310 **BRIAN 10**

2311 17:53 **why are the cells constantly in the medium and not exposed to it like humans take**
2312 **nutrients?**

2313 18:05 humans take nutrients?

2314 18:06 **nutrients food and so the medium is supposed to replace food right?**

2315 18:09 yes

2316 18:10 **food and everything and why why the cells are constantly in their food why they**
2317 **they're constantly fed not like human body eat drink something and then takes some**
2318 **rest or some kind of**

2319 18:26 but you know that if I think the medium mimics a bit the: blood (.) that feeds all the
2320 cells in the body (.) but in the blood you have like a range of glucose and you have less of this
2321 glucose you will start to take fat and usually start to generate glucose or energy (.) so there is
2322 an homeostasis in the blood and in the body and I think the medium tries to mimic this uh
2323 system (.) I I I wouldn't say that in the body there are a lot of (.) very drastic change in the: in
2324 the food and in the concentration of nutrients

2325 19:15 **there is no change?**

2326 19:17 there are changes but there there is a range (.) so: you have the insulin glucagon all this
2327 regulate of of the level so when you don't have it in the blood and you start to be hungry and
2328 you want to eat and then you eat and then it was back back like to the normal but I think the
2329 changes are not so drastic

2330 19:40 **ok (.) so you said that the medium also replaces the blood**

2331 19:45 I would say it's something like blood

2332 19:48 **ok and a while ago you said that the blood is responsible for the temperature**
2333 **regulation ((it was in the previous interview))**

2334 19:52 the blood u:h the blood uh flow because

2335 19:57 **the flow**

2336 19:58 = they have they increase when it's cold to

2337 20:03 **and that what regulates the temperature**

2338 20:05 because the: the need how is with the: I forgot this u::h (.) with the ((trying to
2339 remember the word)) fatty? fatty acids? uh (.) the brown fatty acide pessio or I don't I forgot
2340 the name it's what the one in the body that (.) modulate the temperature (.) but it takes a lot of
2341 energy so you need to also provide with more ()

2342 20:38 **ok (.) now (.) it's uh your thinking about the fatty acid uh**

2343 20:44 yeah brown piece

- 2344 20:45= **tissue? it's responsible for regulating the**
- 2345 20:49 for example the babies they have this u:h before tissue
- 2346 20:52 **ah you mean the stem cells?**
- 2347 20:55 no it's brown it's different we have white and they have brown and the brown is it's
- 2348 more it protects cells from the cold or something (.) to babies
- 2349 21:06 **you mean the hemoglobines?**
- 2350 21:08 no it's it's this is uh
- 2351 21:12 **that's ok**
- 2352 21:13 yeah I will try to find it later
- 2353
- 2354 **DANIEL 10**
- 2355 24:35 **why are the cells constantly in the medium and not exposed to it like humans take**
- 2356 **nutrients? Donc pourquoi elles sont ces cellules abondamment dans le milieu et non pas**
- 2357 **exposées uh comme les être humains mangent boivent après ils s'arrêtent après en fin ils**
- 2358 **sont pas tout le temps dans le la nourriture [**
- 2359 24:55 u::hm ben d'une part il faut quand même que les cellules soient dans un milieu u:h
- 2360 nutritif qu'elles aient besoin de tout ce qu'il leur faut u:h proliférer donc u:h comment dire
- 2361 glucose acides aminés et cetera ↑ après u:h il y ait eu des systèmes un peu plus élaborés (.)
- 2362 c'est un système de pompe qui fait que les (.) effectivement les nutrJoannets sont apportés un
- 2363 peu comme une circulation sanguine c'est quelque chose de dynamique u::h et ça clairement
- 2364 ce sont des:: fin des conditions qui pour l'instant ne sont pas: ne sont pas standards (.) là j'ai
- 2365 vu que c'était l'année dernière où ça a été publié u:h ce type d'appareil
- 2366 25:49 **et pourquoi ils ont eu cette idée de publier [**
- 2367 25:52 Parce que justement ils se sont posés cette question ci c'est se dire ben uh comment les
- 2368 cellules sont capables de u:h de proliférer ou de migrer en étant dans un système où l'apport

2369 en nutrJoannet est dynamique et pas simplement on leur met u:h on leur met un nutrJoannet à
2370 un temps zéro et on va peut être changer juste après quarante huit heures (.) et ça arrive que
2371 c'est pas ça ce qui se passe dans: dans l'organisme

2372 26:21 **il a fallu attendre l'année dernière pour avoir cette question? mais c'est une**
2373 **question qui m'a semblé tellement évidente**

2374 26:29 Je sais pas si:: après il faut aussi l'aspect (.) il y a l'aspect technique je pense qui entre
2375 en (.) trouver u:h ben le bon système donc u:h (.) pour que les cellules:
2376 26:47 **fonctionnent normalement?**

2377 26:47 voilà peut être u:h il y a du (.) au niveau du débit (.) de: de la pompe (.) fin comment ça
2378 se passe u:h le fluide peut être la concentration des nutrJoannets s (.) fin clairement je: uhm
2379 j'ai plus en tête le système

2380 27:06 **donc c'est plutôt une difficulté technique fin la la faisabilité de comment faire**
2381 **passer les nutrJoannets**

2382 27:12 Pour moi je pense que c'est ça

2383 27:13 **c'est ça (.) mais sinon la question elle est importante? dans le sens**

2384 27:17 oui oui oui clairement (.)

2385 27:18 **u:h dans le sens où uh mais c'est toujours vraJoannet uh est ce qu'il n' y a pas eu**
2386 **cette question avant? elle ne s'est jamais posée?**

2387 27:27 Je ne sais pas si c'est ça où uh ça je sais pas honnêtement uh (0.5)

2388

2389 **DILARA 10**

2390 0:02 **ok (.) why are the cells constantly in the medium and not exposed to it like humans**
2391 **take nutrients? Pourquoi est ce que les cellules on les met dans des dans le milieu**
2392 **comme ça constamment (.) elles consomment c'est pas de la même manière comme nous**
2393 **on consomme le (.) enfin on mange et [**

2394 0:25 [pour moi le milieu de culture que l'on mets sur les cellules (.) c'est pour mimer le sang
2395 (.) et donc ce milieu renferme différents nutrJoannets (.) nécessaires à la croissance et à la
2396 survie des cellules et puis dans le même ordre des deux (.) d'idée pardon ce milieu va aussi
2397 recevoir les déchets des cellules (.) et donc c'est pour ça qu'on doit renouveler régulièrement
2398 le milieu puisque le milieu va s'appauvrir en substances nécessaires à la croissance des
2399 cellules et il va s'enrichir en en déchets euh sécrétés par les cellules (.) donc pour moi ça reste
2400 quelque chose de similaire de ce qu'on peut retrouver dans le dans le corps humain vu que on
2401 a des des vaisseaux et puis des tous petits vaisseaux qu'on appellent des capillaires sanguins
2402 qui vont irriguer les cellules de la même façon

2403 1:24 **mais en termes de consommation des ces nutrJoannets (.) uh en fin ces cellules sont**
2404 **exposées tout le temps à ces [**

2405 1:33 [oui comme chez nous on a tout le temps du sang dans nos dans nos veines c'est une
2406 exposition continue (.) maintenant la composition de ton sang va varier par exemple après un
2407 repas tu vas avoir beaucoup plus de sucre dans sang dans c'est pour ça qu'il y a l'insuline qui
2408 va faire diminuer le sucre donc la composition va varier un petit peu (.) en fonction de
2409 journée ici avec le milieu qu'on ajoute sur les cellules on a moins de variations puisque c'est
2410 un milieu standardisé et qu'on mime pas tu vois le fait de prendre de prendre un repas ou ce
2411 genre de choses (.) mais ça reste la même chose (.) les cellules restent en contact avec les
2412 vaisseaux sanguins et l'alJoannetation constante hhh je parle des alJoannets mais on a aussi
2413 les échanges des gaz (.) tu vois il y a l'oxygène les cellules ont aussi besoin d'oxygène pour
2414 grandir et euh et c'est la même chose on a aussi de l'oxygène dans les milieux de culture de
2415 l'oxygène dissout

2416

2417 2:31 **Donc même en terme de de concentration de ces nutrJoannets ça change rien? fin**
2418 **tu trouves pas que il y a par exemple ces cellules là sont exposées à ce milieu dont la**
2419 **concentration est plus ou moins constante [**

2420 2:45 [La concentration est constante oui maintenant en fonction des études on peut jouer sur
2421 la concentration de certains composés par exemple moi pendant ma thèse je travaillais sur la
2422 lipolise donc la lipolise c'est le principe en fait de consommer la graisse qui est stockée dans
2423 tes cellules donc l'énergie est stockée sous forme de graisse (.) et le principe justement d'aller
2424 rechercher cette énergie s'appelle la lipolise et donc habituellement on cultive les cellules
2425 avec 4,5 gramme de glucose par litre ce qui est une concentration classique mais moi comme
2426 je voulais mettre mes cellules en stress j'ai diminué cette concentration là et j'ai travaillais
2427 avec uniquement 1 gramme de glucose par euh par litre de milieu (.) donc on peut jouer sur
2428 différents constituants du milieu en fonction des études qu'on veut réaliser

2429

2430 **GAELLE 10**

2431 0:05 **why are the cells constantly in the medium and not exposed to it as like humans**
2432 **take nutrients?**

2433 0:14 So to::: I don't understand like

2434 0:18 **People take nurtients**

2435 0:21 yes

2436 0:22 **so the medium replcaces the nurtients? right?**

2437 0:25 Yeah

2438 0:25 **what we take what we eat and what we drink**

2439 0:25 Yes

2440 0:27 **But we don't eat and drink all around the year 24 hours 24/7 as we say**

2441 0:34 Yes

- 2442 0:33 we **eat from time to time but the cells are constantly all around the year in the**
2443 **medium**
- 2444 0:39 Because in your body you have you can have a stock of lipi:ds you can have stock of
2445 glucose uh other uhm glygogene glycogen (.) so you've always u::h a stock of energy
2446 somewhere (.) for the cells it's different they don't have like uh lipid uh somewhere in uh the
2447 bulk bulk? ventre? ((laughter))
- 2448 1:13 **in the belly**
- 2449 1:14 in the belly
- 2450 1:16 **stomach? you mean stomach?**
- 2451 1:18 not in the stomach because the stomach is just to digest not stockage
- 2452 1:23 **but where is this stock?**
- 2453 1:25 in the dans la caisse (.) in the adipocytes in the cells which aren't in the:: graisses dans
2454 les graisses lipides
- 2455 1:35 **in the::: yeah dans les graisses the fat**
- 2456 1:39 the fat yes the fact u::h in there are some cells with (.) have stock of glycogyen which
2457 can be degraded into glucose so for the cells they take if glucose to the cells (0.2) it's because
2458 we have u:h a brain that sends everything because we have sensors which gives information
2459 to the brain that we'll give (.) that will say to the organs ok u::h we you have to eat you if the
2460 person don't eat we have to degrade the lip the:: fat (.) we have to make glucose from
2461 glycogen and so on (.) so the cells don't have the::: uhm all this stock stock so we have to
2462 give them
- 2463 2:44 **So from your answer I understand what you're saying is that all (.) that yes the**
2464 **human body too is all the time exposed to**
- 2465 2:52 They are always
- 2466 2:52 **nutrients [**

- 2467 2:53 Yes
- 2468 2:54 **because there is stock**
- 2469 2:54 for sure if we don't eat during three weeks uh we'll not have stock anymore but
- 2470 3:05 **3 weeks you said?**
- 2471 3:06 no not three weeks may be more it depends from the people but uh
- 2472
- 2473 **CÉDRIC 10**
- 2474 18:48 **why are the cells constantly in the medium and not exposed to it like humans take**
- 2475 **nutrients? see we as human beings bodies take food and water other liquids from time**
- 2476 **to time but the cells are constantly in the medium why is that like that?**
- 2477 19:11 but your b:ody is quite the same (.) I mean you eat from time to time (.) so like you eat
- 2478 and then you take water but in your blood stream you are constant (.) nutrients level like you
- 2479 have in the cells like medium
- 2480 19:32 **so you mean u:h mm the body inside (.) the cells of the body already take all time**
- 2481 **like u::h like the cells [**
- 2482 19:41 yeah
- 2483 19:41 **they all the time take?**
- 2484 19:42 yeah because like you have the blood that's going through your body (.) and inside the
- 2485 blood you have the right glucose concentration the right nutrient concentration and that's just
- 2486 circulating in your body so when the cells need something they just take it out that's it
- 2487 it's not a process like u:h you know you're eating all your cells take some part of what you eat
- 2488 and then they are waiting for the next wave of eating ()
- 2489 20:18 **they are constantly consuming?**
- 2490 20:20 yeah

2491 20:21 **ok what about the flow and concentration? so they're consuming in a different**
2492 **way (.) there's the blood circulation so there is this effect of flow and of concentration of**
2493 **the different components of glucose (.) in the case of the cells that you work with here**
2494 **they have constantly the same (.) something that is stagnating there**

2495 20:46 yeah you have you have some people I guess that are cultivating with flow I'm not sure
2496 of that (.) yeah that that would change some stuff

2497 21:01 **so the flow technique is already there?**

2498 21:04 for some stuff yeah but I don't know if you cultivate in the flow I I know some people
2499 cultivate in bottle that's rolling (.) so the medium is always u:h always moving in the cell

2500 21:19 **why moving? why is it important to move**

2501 21:23 in this case I don't know why it's (.) I don't know I don't remember I (.) it was when I
2502 visited the factory and they were cultivating the cell this way (.) like through the bottle on the
2503 rack and they were spinning all the time

2504 21:40 **so the fact that (.) when I asked first question was why are the cells constantly in**
2505 **the medium and not exposed to it like humans take nutrients so this way means is not**
2506 **exactly as humans take nutrients?**

2507 21:58 no because the flow is (.) almost () in your in your u:h blood sup blood vessel but
2508 outside the blood vessel it's not a flow it's just u:h medium with a gradient of nutrient

2509 22:18 **ok so does this mean that they way we are mimicking is not is not g it's not good**
2510 **it's better with the flow?**

2511 22:25 no I no I'm not sure it's better with the flow (.) the flow may be now I'm thinking back
2512 about it (.) it was just to allow to cultivate cells all around the bottle and then by spinning it
2513 you always have medium going () the cell but I'm not sure it was done to get an effect from
2514 the flow but just to use the flow to give the nutrient to all the cell

2515 22:53 **ah ok**

2516 22:55 the only cell like that are in close contact with flow are the endothelial cell
2517 23:02 **are?**
2518 23:03 the endothelial cell that are
2519 23:04 **endothelial**
2520 23:04 cell that are inside the blood vessel all the other one are there just outside the blood
2521 vessel and you have the concentration going through the blood vessel so they are not exposed
2522 to flow
2523
2524 **PAUL 10**
2525 0:00 **ok (.) with regard to the medium now (.) why are the cells constantly in the medium**
2526 **and not exposed to it like humans would take nutrients?**
2527 0:11 (.02) because we (.) cannot easily do otherwise
2528 0:22 **u:hm I heard that there is another system of flow the like:: like a medium flowing**
2529 **not like that have you heard of?**
2530 0:35 yes
2531 0:37 **and what is the difference or the merit of the other system?**
2532 0:44 (0.6) well that you you will u::h be closer to the:: the:: the reality (.) you will not start
2533 with a:: high amounts of nutrients and amino acids to be sure that after 2 days you to have
2534 enough for the cells to proliferate in your in your plate (.) u:h you you will constantly expose
2535 and to quite do the same amount as it is when blood is u:h constantly fueling new stuff from
2536 the from the nutrition (.) ↑ this kind of of setp up start to be u::h developed it's () quite
2537 anecdotal right now
2538

2539 **DALILA 10**

2540 0:05 **why are the cells constantly in the medium and not exposed to it like humans take**
2541 **nutrients? Tu comprends ma question? [**

2542 0:14 oui

2543 0:14 **Pourquoi est ce que les cellules ont constamment dans le milieu [**

2544 0:17oui

2545 0:19 **et ne reçoivent [**

2546 0:21 oui (.) une nutrition constante alors que nous c'est:::

2547 0:24 **voilà (.) on mange de temps en temps (.) on boit de temps en temps voilà euh**

2548 0:30 u::h mmm poff (.) je pense que le fait de manger ça apporte des nutrJoannets mais au
2549 final c'est quand même dans le sang d'une manière constante (0.12)

2550 0:48 **donc si j**

2551 0:48 à part à part le glucose qui fait de l'hypo glycémie je pense que le reste y a des équilibres
2552 qui se font y a des trucs qui sont transformés des machins comme ça donc au final t'as (.) et
2553 puis ça reste aussi toujours de l'in vitro quoi il y a des artefacts (0.8)

2554 1:12 **Qu'est ce que tu entends dire par artefact?**

2555 1:15 ben l'in vitro c'est de l'in vitro c'est pas c'est pas euh c'est uh::on sait pas
2556 reproduire comme ça dans une flasque toute la complexité du corps humain (0.3) c'est pour
2557 ça qu'il faut u:h (.) qu'il y a des étapes en plus (.) comme () des choses comm ça

2558 1:35**oui mais le problème quand eu:h oui on ne sert pas reproduire mais si la recherche**
2559 **n'aboutit pas on va pas passer à l'in vivo in vivo**

2560 1:44 oui (.) ah non oui bien sûr (.) et pareil des choses qui fonctionnent super bien in vitro ne
2561 vont pas fonctionner in vivo parce que il ya tellement de choses qui qui interagissent avec
2562 elles qu'on sait pas reproduire (.) qui fait que (.) mas bon l'avantage de l'in vitro c'est que c'est
2563 facile (.) c'est que des cellules on les a en culture et ça donne déjà une première idée

2564 **JOANNE 10**

2565 0:02 **why are the cells constantly in the medium and not exposed to it like humans take**
2566 **nutrients? You know that humans eat and drink from time to time (.)**

2567 0:15 uhum

2568 0:15 **but the cells are constantly swimming in the in the medium**

2569 0:21 uhum you m what what you mean by the question? like why we give them directly the
2570 medium

2571 0:28 **they are they are 24/7 in the medium right? so they are getting**

2572 0:32 24?

2573 0:32 **24/7 24 hours a day 7 hours a week**

2574 0:35 Yes yes

2575 0:36 **right?**

2576 0:38 yes

2577 0:38 **in the medium all along the year**

2578 0:40 uhum

2579 0:41 **but humans ourselves in our body don't get food and u:h drinks all the time (.) we**
2580 **take from time to time**

2581 0:50 yes

2582 0:50 **why we don't try to find a similar condition? why all the time they are swimming in**
2583 **their food?**

2584 0:57 again it's (.) in the body it's a complicated (.) thing (.) it's a complicated mechanism (.)
2585 when you feel hungry there is a message will be like trans:mited to the brain and the brain
2586 will ask y your stomach to eat and will u:h you will you will go and eat something and when
2587 you eat another thing like we don't take u::h the food is not different from the food you put
2588 on the cells and it's another mechanism and stuff but the cells you put always medium (.)

2589 nutrients because you you don't know when they will need it (.) when they will need to u::h to
2590 take the nutrients (.) so you put like that for for 24 hours (.) and when you will need they will
2591 take (.)

2592 1:52 **oh you mean even the cells don't consume from the medium all the time? They are**
2593 **just in there but they take whenever they want?**

2594 1:59 Yes I think (.) so if they don't need why they will take?

2595 2:03 **ok that you your your colleague said the opposite thing (.) she said ok people don't**
2596 **eat all the time**

2597 2:09 yes

2598 2:09 **but there is this fat la graisse that the body consumes from it even if you're not**
2599 **eating (.) but the body the cells in the body are consuming so she said the body is**
2600 **actually eating and drinking all the time because they are consuming from the fat**

2601 2:29 Yes

2602 2:29 **that's what she said**

2603 2:33 Yes that's right but it depends on the the needs of the cells (.) like the cells needs u::h
2604 energy (.) so they will consume (.) like for the temperature we come back to the temperature
2605 again (.) we can (.) we can use the energy to regulate the temperature (.) so they will consume
2606 (0.3) I don't know exactly ((laughter)) I think uh it's not u:h 24 hours a day they consume

2607 3:17 **but at least they are 24 hours a day exposed to the medium**

2608 3:20 yes because when they will need what they're they are in the medium they will take it

2609 3:26 **but th:ey are exposed you mean they are exposed but then they're not consuming**
2610 **you're b supposing that they are exposed but they are not consuming?**

2611 3:34 no they are consuming of course

2612 3:36 **all the time?**

2613 3:39 I don't know if it is all the time or u:h

2614 **11. Have you personally thought about the question before?**

2615 **STEPHAN 11**

2616 27:18 **Have you heard uh personally thought about this issue before?**

2617 27:23 uhm (.) at least for: myse::If I know it's it's sometimes can be an issue like when I was
2618 working on cells that were very demanding in their energy and very active (.) and I
2619 understand if I didn't substitute the medium myself that they would (.) deteriorate in quality
2620 very fast so for instance like that it would be () better to grow in this in a continuous system
2621 of new supplies in nutrients (.) so but since we did not have any equipment in our lab I was
2622 just changing the medium everyday myself (.) instead of using the machine

2623

2624 **BRIAN 11**

2625 21:16 **ok now have you personally thought about this issue before? the issue of the**
2626 **medium that is constantly on the cells?**

2627 21:26 uhm yes of course because uh I think it's it's not as constant the fact you you you (.)
2628 you put the cells in a medium with u:h for example: 25 millimoles of glucose (.) and after 2
2629 days may be they don't have more (.) any more glucose (.) however in the blood you know
2630 you eat and then more glucose goes to the blood and keeps the level constant however in the
2631 tissue culture you have to change the medium every 2 or 3 days to avoid this decrease and the
2632 notches because if there is no replace (.) you will have the medium and the cells are taking
2633 the nutrients from the medium (.) it's not like in the blood and you have (.) constant renew

2634 22:15 **ok have you personally thought about this issue of [**

2635 22:18 [yes

2636 22:18 = **whether we whether we need to keep the medium all the time or we keep**
2637 **changing it?**

2638 22:25 yes yes

2639 22:25 **you thought about it?**

2640 22:25 ↓ yes

2641

2642 **DANIEL 11**

2643 27:39 **Bon alors venons à la deuxième question (.) did you personally thought about this**
2644 **issue before? Est ce que vous avez pensé à ça avant? Est ce que vous avez eu l'occasion**
2645 **de réfléchir à ça? Au mécanisme de comment les cellules doivent consommer**
2646 **ces nutrJoannets? Est ce que le fait de les lisser comme ça tout le temps ap**
2647 **abondamment dans le medium ça peut jouer**

2648 28:03 oui oui ça c'est quelque chose que: uhm à laquelle uh: je pense uhm surtout nous qui
2649 travaillons sur le métabolisme donc uh la façon dont les cellules produisent dans le milieu à
2650 partir des nutrJoannets (.) on a dans nos projets (.) u:h une pensée sur uh ben faire varier (.) la
2651 quantité de: des nutrJoannets dans le milieu (.) et voir comment les cellules uh s'adaptent (.)
2652 u::h et ce au cours du temps que ce soit même en traitement aigu ou sur le long terme sur
2653 plusieurs mois (.) voir u:h voir si on les prive d'une source de nutrJoannet est ce qu'elles
2654 peuvent compenser en remontant la:: ben le (.) la captation d'autres sources (.) ↑ ce qui se
2655 passe dans dans l'organisme puisqu'il y a les cellules sont pas toujours u:hm prêt d'un
2656 vaisseau sanguin ou: prêt d'une source en tout cas de de nutrJoannets donc elles ont besoin
2657 de: si elles veulent continuer à proliférer ben s'adapter à leurs micro environnement qui peut
2658 être appauvri en glucose ou en acides rares (.) et c'est ça les cellules cancéreuses on sait qu':
2659 elles ont cette capacité à s'adapter

2660 29:29 **mais par rapport à l'abondance maintenant (.) est ce que vous avez pensé ça vous**
2661 **avez pris ça au sérieux avant ou vous ()**

2662 29:36 l'abon le fait de faire ça sans dynamique?

- 2663 29:39 **le fait que les cellules sont abondamment dans le milieu est ce que vous êtes posés**
- 2664 **la question si c'est c'est bien c'est pas bien ça biaise ça biaise pas?**
- 2665 29:50 ben le f (.) oui ça u:h j'y ai pensé (.) le fait que: on de toutes façons elles ont besoin
- 2666 d'un milieu clairement si elles n'ont pas de milieu u:h elles vont mourir (.) après u:h on a
- 2667 pensé qu'est ce qu'on met dans ce milieu (.) et pas simplement sortir notre bouteille
- 2668 30:10 **ouais**
- 2669 30:11 (.) parce qu'on a des mil c'est pour ça que (.) moi dans mon projet je fais mon milieu
- 2670 moi même (.) je prends une base (.) en poudre mais après je rajoute u:h ce que je veux (.) et
- 2671 les quantités que je veux (.) je prends pas une bouteille qui est toute faite uh
- 2672 30:29 **oui mais le fait que vous rajoutez vous mettez ça vous changez quand ça devient**
- 2673 **pale et cetera mais mais le fait le les est ce que vous avez eu l'occasion de penser**
- 2674 **pourquoi le milieu est tout le temps là bas mais que vous vous êtes dit mais il y a pas**
- 2675 **d'autres moyens ou vous n'avez pas eu la question?**
- 2676 30:50 (0.3) non c'est pas uh (0.1) c'est pas en f on (.) pour la culture standard c'est vrai que:
- 2677 toujours changer le milieu euh tous les deux jours pour s'assurer que les cellules avaient u:h
- 2678 toujours les nutriments nécessaires après c'est:
- 2679 31:08 **est ce que les cellules peuvent rester sans sans medium pour un petit moment par**
- 2680 **exemple euh dans la semaine je sais pas une demie heure un quart d'heure? de temps en**
- 2681 **temps uh**
- 2682 31:17 sans milieu?
- 2683 31:19 **cinq minutes ou en alternance par exemple cinq minutes oui cinq minutes non**
- 2684 31:24 uhmm:
- 2685 31:24 **dans un système qui circule tout le temps?**
- 2686 31:28 ça je sais pas j'ai jamais essayé donc je pouvais pas dire et uh je pense que si sur des
- 2687 temps courts les cellules sont capables de résister au pire elles vont arrêter de proliférer (.)

2688 alors elles se mettent dans un état un peu de:: ben juste de résistance donc vont plus rien faire
2689 une fois une fois qu'elles ont de nouveau les sources de nutrJoannets elles vont redémarrer
2690 euh le processus ensuite elles vont bloquer quand elles ont plus de milieu

2691

2692 **DILARA 11**

2693 3:43 **D'accord (.) have you thought about this issue before? Est ce que tu avais pensé à**
2694 **cette question (.) la question que je posais de cette manière et ce que t'avais [**

2695 3:53 Non (.) en fin OUI OUI (.) SI (.) J'ai envie de dire oui en fait parce que on a développé
2696 un modèle de Lipolyse où qui se rapprochait le plus possible de ce qu'on retrouve en fait chez
2697 l'homme (.) et habituellement tu vois on met le milieu en contact avec les cellules et puis on
2698 le laisse pendant un jour deux jours et puis on vient récupérer les cellules (.) mais on fait c'est
2699 pas vraJoannet ça qui se passe chez l'Homme parce que chez l'Homme un flux sanguin
2700 constant (.) donc le sang passe on a tout le temps le le milieu si tu veux qui est en contact
2701 avec les cellules est constamment renouvelé et donc nous on a essayé de mimer au mieux ce
2702 renouvellement du milieu et donc on changeait en fait nos milieux toutes les heures ou toutes
2703 o toutes les deux heures (.) tu vois pour essayer de se rapprocher et donc c'est un peu dans la
2704 même dans le même ordre d'idées tu vois on voulait se rapprocher de ce qui se passe dans le
2705 corps humain et donc essayer d'avoir un renouvellement du milieu assez rapide

2706 5:00 **D'accord (.) Stephan m'a parlé d'un système qui a en fin un système de flow de**
2707 **flux**

2708 5:04↑ [oui

2709 5:07 = **qui fait le travail que tu viens de dire [**

2710 5:10 [oui ↑

2711 5:10 = **automatiqu [**

2712 5:11 [↑oui oui

2713 5:11 = **un automatisme**

2714 5:13 Oui je connais

2715 5:14 **Alors pourquoi est ce qu'on a recours à ça ? Pourquoi on le fait?**

2716 5:20 Oui je pense que c'est dans le même euh dans le même but que ce que je viens de
2717 t'expliquer parce que dans les perspectives de ma thèse c'était justement d'acquérir au sein du
2718 labo ce gendre de dispositif (.) bon c'est coûteux donc il faut intégrer ça forcément dans le
2719 projet de recherche mais je pense que c'est plus facile (.) non d'une part c'est plus
2720 représentatif (.) de ce qu'on retrouve en chez l'être humain voir l'animal en in vivo en général
2721 h h et puis c'est aussi plus facile parce que tu vois changer le mieux toutes les heures ou
2722 toutes les deux heures ça demande un temps incroyablement hhh ((laughter))

2723 6:00 **Oui mais si tu compares ce système là à ce qu'on utilise ici ou à ce qu'on utilise en**
2724 **général il y a une valeur ajoutée ?**

2725 6:10 Il y a une valeur ajoutée à mon sens oui OUI dans l'étude que je faisais parce que ça
2726 avait du sens parce qu'on fait donc la Lipolise ce sont des trilisérines la graisse dans les
2727 cellules et puis la graisse sort des cellules (.) mais si tu laisses le milieu en contact avec les
2728 cellules la graisse re-rentre dans les cellules alors que dans le corps la graisse qui sort des
2729 cellules part dans les circulations sanguines vers d'autres organes et donc dans ce cas bien
2730 précis ça avait énormément de sens de faire venir ce genre d'appareil

2731 6:49 **Ah donc ça dépend de la recherche**

2732 6:51 Oui

2733 6:51 = **protocole et [**

2734 6:52 [parce que si maintenant étudier l'exposition euh j'invente au mercure (.) ben voilà il
2735 faut que le mercure reste en contact avec les cellules pendant 6 heures douze heures tu vois si
2736 c'est une exposition long terme (.) et donc je pense que c'est un peu en fonction du design de
2737 l'objectif de l'expérience

2738 7:12 **Et pas nécessairement à à ça ne rajoute pas nécessairement à la culture cellulaire**
2739 **d'une manière générale il voir l'objectif de la recherche? Si on parle de la culture**
2740 **cellulaire est ce que ça rajoute est ce que ça améliore est ce que c'est mieux?**

2741 7:27 Je pense que ce serait mieux dans l'idée parce qu'on se rapproche de l'in vivo (.) donc ce
2742 serait plus plus proche de ce qui se passe réellement (.) maintenant je ne sais pas si en termes
2743 de résultats on aura une grande différence parce que si t'as un milieu qui eh qui tourne mais
2744 finalement tu étudies la concentration du mercure et que ta concentration de mercure est
2745 constante au fil du temps finalement est ce que ça va influencer les résultats je ne suis pas
2746 sûre (.) mais voilà pour moi c'est euh [

2747 7:59 [**Mais du moment**

2748 7:59 [Faire progresser le in vitro vers l'in vivo quoi (.) pour moi c'est quand même un plus (.)
2749 mais je ne suis pas sûre que les résultats seront différents

2750 8:08 **D'accord donc c'est juste que c'est plus proche de ça fait que l'in vitro est plus**
2751 **proche que ce qui se passe dans le corps humain**

2752 8:18 oui oui

2753

2754 **GAELLE 11**

2755 3:14 **ok (.) have you thought about this issue before? the facts that uh cells are**
2756 **constantly exposed to the nutrients and may be they need to take some rest**

2757 3:25 not constantly exposed but may be this these nutrients may be u::h we're not for
2758 example some amino acids we're not may be taking all the same range (.) of stuff (.) but
2759 mostly it's uh we have all uh we have how to say u::h regulation stuff in our body which
2760 mean that we are we've all a range in which we are the same

2761 4:00 **uhum**

2762 4:01 you understand what I say? ((laughter))

2763 4:03 **yeah a little bit but the question was about have you thought about the fat that cells**
2764 **should or should not be constantly in the medium may be**

2765 4:13 this question exactly no (.)

2766

2767 **CÉDRIC 11**

2768 23:20 **ok now have you personally thought about this issue before?**

2769 23:23 no

2770

2771 **PAUL 11**

2772 1:28 **so have you thought about this issue before?**

2773 1:31 yes but again it's because of all all business here in the lab which is to understand
2774 metabolism and u:h we precisely u::h introduce these kind of u:h of thinking in in in the way
2775 we u:h we set up our experJoannets because we we can say that some times in a tumour (.) if
2776 a tumor is growing (.) u:h at some times the nutrients will not be available u:h as easily
2777 because there is no enough blood vessels in the tumor for instance to bring it to all tumor
2778 cells (.) so they are u:h or when you treat your cells with a compound it really () some cells
2779 (.) it will module the access to the nutrients (.) so we try to recapitulate these also in our
2780 experJoannets (.) there are experJoannets where we do we move u:h all the glucose all the
2781 glutamine all the fatty acids all the (.) and replace it by the lactate for instance which is the
2782 u::h a waste product (.) which is usually considered to be (.) eliminated but that we know to
2783 be sometimes the only way for cells to u:h to survive so because of these being the core
2784 business of the lab we we do integrate the u::h the the thinking about the nutrient
2785 concentration in our experJoannetal

2786

2787

2788 **DALILA 11**

2789 2:05 **ok (.) have you personally thought about b this issue before? est ce que tu as p**
2790 **réfléchi sur ça ou entendu parlé de ça fin cette question de pourquoi elles sont ces**
2791 **cellules constamment dans le milieu? elles consomment constamment alors que les**
2792 **cellules humaines**

2793 2:19 mais non (.) en dehors d'ici non

2794 2:20 **ah vous avez quand même parlé de ça**

2795 2:23 ((laughter)) on a parlé de tout ((laughter))

2796 2:26 ((laughter)) **et comment vous trouvez ça? comme question**

2797 2:32 on a plus parlé de l'incubateur que de:: que de ce truc de milieu (.) en fin il y a une
2798 personne qui m'a je ne sais plus qui mais euh:

2799 2:46 **Marie?**

2800 2:47 je sais pas

2801

2802 **JOANNE 11**

2803 3:42 **ok have you personally thought about this issue before?**

2804 3:46 No

2805

2806 **12. Do you think that this question is an important one?**

2807 **STEPHAN 12**

2808 28:12 **Ok do you think that this question is an important one?**

2809 28:14↑ I think it's important (.) I think you have to (.) < if you are (.) every () of profiling
2810 enough clean medium uhm nutrients at regular intervals is important otherwise your culture
2811 cells are affected and >

2812 28:34 **ok the question is why is it important so you said for profiling?**

2813 28:43 so why it's important to (.) because if the cells are not receiving enough fresh nutrients
2814 and if they are left too long in their waste products (.) may be the quality of the cells will
2815 become affected and they will start behaving differently

2816

2817 **BRIAN 12**

2818 22:26 **ok (.) u:h do you think that this question is an important one?**

2819 22:33 yes it's an important one

2820 22:35 **see what see what I'm talking about? I'm talking about the fact that may be we**
2821 **need a process that changes the medium and it's not constantly there**

2822 22:48 I think as soon as you replace the medium you change the medium for () fresh medium
2823 every two three days there is no need to do this u::h system that use ↓

2824 23:03 **ok (.) so why? why it's not important or what it's important you said**

2825 23:10 for me it's important you have to the: the same levels of nutrients more or less all the
2826 time

2827

2828 **DANIEL 12**

2829 32:00 **et la question que je pose est ce qu'elle est importante? le fait fin de se questionner**
2830 **sur l'abondance?**

2831 ((noise, someone else speaking))

2832 32:06 oui oui oui ça c'est quelque chose qu'on a toujours à l'esprit fin::: dans nos projets (.)
2833 c'est: réfléchir le mieux possible à ce qu'on met dans le milieu à quelle quantité combien de
2834 temps (.) la dynamique donc clairement on a pas ce système pour faire ça mais uh mais c'est
2835 quelque chose qu'on on essaye quand même de prendre en cons après u:h: (.) le mieux qu'on
2836 peut uh à no à notre échelle quoi

2837

2838 **DILARA 12**

2839 8:22 **Do you think that this question is an important one? tu penses que cette question**
2840 **est importante (.) comme intérêt ?**

2841 8:28 Oui oui je pense que c'est important euh c'est important dans différents cas fin il faut se
2842 poser la question parce que il faut être sûre que l'expérience qu'on va mettre en place euh ne
2843 serait pas influencée justement par le renouvellement du nouveau milieu

2844 8:50 uhmm

2845 8:54 tu vois si tu veux tester l'exposition du mercure ben voilà peut importe il y aura toujours
2846 une concentration constante de mercure sur tes cellules donc là à mon sens que t'ai un flow ou
2847 pas ça changera rien (.) maintenant il y a des cellules aussi qui euh qui imitent la barrière
2848 intestinale tu vois? et donc on étudie voir si certains nutrJoannet passent la barrière intestinale
2849 ou alors sont évacués ben à mon sens c'est important aussi là d'avoir un mouvement parce que
2850 dans ton intestin il y a du mouvement alors que tu vois si t'as une petite plaque en plastique
2851 bhhhh fuhhh oui ça te donne une idée mais c'est pas hyper représentathhhif ((laughter)) de
2852 ce qui se passe tu vois je crois que ça dépend un peu le

2853 9:44 **Surtout si on rajoute d'autres d'autres facteurs qui sont pas aussi enfin hhh**
2854 **semblables à ce qui se passe dans le corps humain par exemple**

2855 9:50 OUI PAR EXEMPLhhhhE ((laughter))

2856 9:52 ((laughter)) Je sais où tu veux en venir ((laughter))

2857 **9:55 ((laughter)) Non ne serait ce que par exemple les cellules ne sont pas à these are**
2858 **called immortalized cells c'est ça? c'est même pas des cellules comme primaires et donc**
2859 **voilà**

2860 10:09 Ah oui oui ça c'est une (.) mais moi je n'ai jamais travaillé avec des lignées cellulaires
2861 qui sont immortalisées

2862 **10:14 ah**

2863 10:16 Je travaillais uniquement avec des cultures primaires et donc culture primaire si tu
2864 prends un échantillon directement dans un animal tu isolés des cellules et puis tu les mets en
2865 culture donc elles ont quand même les caractéristiques de l'animal

2866 **10:31 Du vrai quoi**

2867 10:32 ouhiii ((laughter))

2868 **10:33 ((laughter))**

2869 10:36 c'est ça

2870

2871 **GAELE 12**

2872 4:16 **ok (0.5) no now do you think that this question is an important one?**

2873 4:26 yes (.) important not important but it's uh yes it's important as well

2874 4:32 **why?**

2875 4:37 Because it's the basical u::h way that we work so it has to be the right way

2876 4:54 **I don't understand very well**

2877 4:56 the medium since I'm working on metabolism

2878 4:59 **uhm**

2879 4:59 it's important to understand what the cells are uhm have as nutrients (.) to be sure it's the
2880 same it's the right condition (.) to not study somethin:: with wrong basis

2881 5:22 **and this is (.) this factor is important too? the factor that considering or thinking**
2882 **about whether to expose them all the time or give them some rest because may be**
2883 **they're weakened or whatever**

2884 5:35 no for me it's more the::: the concentration of each stock not really the fact that it's
2885 exposed all the time or not (0.5)

2886

2887

2888 **CÉDRIC 12**

2889 23:25 **do you think that this question is an important one?**

2890 23:31 yeah it might be like when I was think for endothelial u:h cell there are in your life
2891 exposed to flow because they are inside the blood vessel and when you are cultivating
2892 cultivating it here in the lab they don't have the same flow so may be important

2893 23:57 **why?**

2894 23:59 because like the:: (0.2) physical u:h component of the flow may have an impact on the
2895 cell itself

2896

2897 **PAUL 12**

2898 3:01 **so you think this question is important to consider?**

2899 3:01 definitely (.) and I I I keep (.) every time I'm part of a jury (.) not this only in my field I
2900 keep asking the question are you sure that u:h u:h what you see is not influenced by the
2901 deprivation of your medium u:h in one nutrients? You have many experJoannets where
2902 people use the so called u:h cell super supernatant (.) so it's the the cells which do the cell
2903 which does release some substance in culture it will do it in the medium (.) and people
2904 sometimes take this medium to put it on other cells to see the dialogue between two cell
2905 population (.) u::h so the substance has been released by the cell number one and is tested on
2906 what it can go on the cell number two (.) these cell types are often different but (.) if you take
2907 this medium you not only take the substance which has been released by the cell which take
2908 (.) you take the (.) what is left in the medium after: the nutrientrient have been been
2909 consumed by the the cells so yeah probably a certain amount of glucose a certain amount of
2910 glutamins some waste of the tissue have been released (.) and when you transfer that you'll
2911 not transferring the fresh medium you're transferring a medium which has been modulated
2912 altered in its metabolic content so we u:h I keep asking this question because this is clearly

2913 some some u:h limitation in many studies or some mis (.) interpretation u:h because of of
2914 people not taking care of basic thing like the medium content

2915

2916 **DALILA 12**

2917 2:50 **ok do you think that this question is important? or not?**

2918 2:55 non

2919 2:56 **elle n'est pas importante?**

2920 2:57 non (.) à partir du moment où on travaille sur des cult sur des cultures cellulaires on sait
2921 que il y a des choses qui:: (0.2) qui ne sont pas:: fin que c'est pas tip top avec ce qui se passe
2922 en vrai donc:: après on se fait: on se fait une raison là dessus et puis on avance quoi et puis on
2923 se pose pas ce genre de question (.) avant je me suis jamais posé ce genre de question

2924

2925 **JOANNE 12**

2926 3:51 **do you think that this question uh is important?**

2927 3:55 Yes

2928 3:58 **Why**

2929 4:01 hum::: (.) ↓ we because (.) it is important to know if we can u::h like ↓ I don't know
2930 exactly how to say that (0.5) I don't know because if we: remove the medium the cell will die
2931 (0.4) I will have to think about it ((laughter))

2932

2933 **13. Do you think that this question has been trivialized?**

2934 **STEPHAN 13**

2935 29:02 **do you think that this question has been trivialized? Neglected? Ignored?**

2936 29:08 u:hm::

2937 29:11 **the fact [**

2938 29:11 [I think at sometimes it's (.) it's not very trivialized but sometimes people they are n::ot
2939 taking it into consideration as much as maybe as it should

2940 29:24 **you know what I'm talking about? I'm talking about the fact that we need to**
2941 **think of a system that allows the changing of the medium as we would do in our own [**

2942 29:33 [it's in our own (.) own body

2943 29:34 **Yes that's what I'm talking about (.) ok so I'm talking about that (.) do you think**
2944 **that this question has been trivialized? or neg ignored? This matter**

2945 29:44 u::h may be it's trivialized in the sense that it's very easily to be () too much and we
2946 have tricks and buffers that can u::h (.) you know compensate for the medium problems and
2947 if you once in a while replace it (.) it's a big enough substitution (.) so I guess it's somewhat
2948 triviali::zed but also to the other extent I think in most cases in practice (.) I think that the::
2949 effect might be marginal that we would gain by using such a system (.) but again for some
2950 cells I agree that it might be better to have such a more elaborate system

2951 30:45 **So why it's been neglected or not u:h not [**

2952 30:49 Because n (.) there is (.) it's easier to: do it in this similar way (.) it's more (.)

2953 → it's cheaper it's faster it's (.) yeah it's u:h (0.3) it's the falsely cheaper ((laughter))

2954

2955 **BRIAN 13**

2956 23:24 **ok (.) do you think that this question has been trivialized or neglected in the: in**
2957 **the your research not only in your own research in the: the your specialty or domain**

2958 23:35 Yes I would say some labs that (.) here is the lab is specialized in metabolism (.) so it's
2959 quite involved in the: how the nutrients are used by the cells (.) so: we take care of this u::h
2960 issue (.) so we change the medium every tow three days to keep always the same levels of
2961 nutrients (.) but I would say labs working more in: (.) more distant from metabolism (.) it
2962 could be an issue (.) you don't take care of this u:h problem

2963 24:14 **why?**

2964 24:16 because they are focusing (.) they have their regulation of given gene for example (.)
2965 and you don't think in this problem (.) it's true that sometimes u:h you're trying to try
2966 installation and (.) because you have variability in your results and this could be (.) one of
2967 the: () of having difference in: (.) in your results (.) so if you use cells with fresh medium or
2968 you use cells with u:h medium which has already used all the glucose or the amino acids and
2969 already already the cells secreted a lot of lactic and reacidify the medium (.) you would
2970 change the activity of proteins (.) activity and expression and whatever (.) it would change
2971 things for sure in the cells (.) so it's important to work always in the (.) more constant

2972

2973 **DANIEL 13**

2974 32:42 **et est ce que vous pensez maintenant que la question a été trivialisée? Elle n'a pas**
2975 **été prise en compte? Négligée?**

2976 32:50 u:h je dirais un peu négligée (.) uh par une grande partie de: des scientifiques j dirais un
2977 petit peu moins dans (.) les gens qui travaillent sur le métabolisme puisque ça reste à uh fin le
2978 les nutrJoannets les choses comme c'est clairement notre uh notre domaine donc on y pense
2979 un petit peu plus (.) mais clairement fin par exemple si je compare à ce que je faisais pendant
2980 ma thèse (.) je réfléchissais pas trop à ce qu'il y a avait dans mon milieu la concentration en
2981 glucose ou en glutamine (.) pour moi c'était des conditions standards qu'on m'avait donné (.)
2982 mais j'avais pas en tête uh:: ben l'impact que ça avait sur uh sur les conditions des cellules (.)
2983 donc je pense que inconsciemment il y a quand même un: oui une partie: de trivialité: sur ces
2984 conditions de: culture et des milieux

2985

2986 **DILARA 13**

2987 10:37 **Do you think that this question has been trivialized? tu penses que cette question**
2988 **cet intérêt est plus ou moins trivialisé il n'a pas pris en fin on a besoin de vraJoannet**
2989 **penser plus à ça? ou est ce que c'est une question qui est rejetée un peu négligée ou**

2990 10:53 Je pense que tout dépend du laboratoire je crois qu'ici la question est n'est abordée
2991 parce qu'on on se focalise vraJoannet sur des aspects très très précis euh de la cellule tu vois
2992 avec on va vraJoannet très très très loin dans les processus de biologie de biochimie (.) donc
2993 on va étudier l'enzyme alors que si dans des études tu vois on étudie le passage nutrJoannet
2994 ou alors l'exposition d'un polluant ce genre de chose là je pense que c'est plus qu'important de
2995 se poser la question (.) mais ici finalement on étudie pas au niveau de la cellule on est bien
2996 plus profond

2997 11:36 **Mais indépendamment de l'objectif de la recherche si on parle de la culture**
2998 **comment améliorer la culture cellulaire tu disais par exemple que ce flow est important**
2999 **puisque chez l'être humain il y a ça (.) en fin alors qu'est ce tu en penses? fin si si**

3000 11:54 Pour moi oui c'est important

3001 11:57 **Et don en fin quand on parle maintenant de la recherche en général en oncologie**
3002 **en cancérologie est ce que il y a vraJoannet besoin de penser plus à ça ? ou est ce que tu**
3003 **trouves que cette question est quand même négligée?**

3004 12:15 La question est négligée mais est ce qu'il faut la négliger je pense que c'est à nouveau
3005 du cas par cas j'ai pas envie de faire des généralités et je pense que c'est vraJoannet au cas pas
3006 cas

3007 12:28 **Même si la culture cellulaire elle s'applique à tout le monde**

3008 12:31 oui ↓ oui oui

3009 12:33 **ça indépendamment de l'objectif de la recherche on passe tous par la culture**
3010 **cellulaire**

3011 12:37 oui ah oui oui parce que la culture cellulaire ça porte le même nom mais c'est très varié
3012 (.) pour moi c'est hyper varié il y a la culture cellulaire primaire (.) il y a les lignées
3013 cellulaires (.) ce que je t'ai expliqué tout à l'heure avec la barrière intestinale en fait c'est des
3014 cellules qui sont euh en lipitation si tu veux et donc il y a du milieu au dessus du milieu en
3015 dessous et donc ça c'est encore un autre type de culture (.) Gaëlle la culture qu'elle fait c'est
3016 des cellules qui sont en mouvement dans un liquide qui ne sont pas adhérentes donc c'est de
3017 la culture cellulaire aussi mais c'est complètement différent quoi tu vois c'est comme les
3018 voitures il y a différents types de voitures il y a différents types de cultuhhhure cellulaire
3019 ((laughter))

3020

3021 **GAELE 13**

3022 6:03 **Do you think that this question has been trivialized? neglected? the fact that**
3023 **nobody asked this question before? for example (.) or you don't consider it**

3024 6:16 I never heard this question before (.)

3025 6:26 **Why in your opinion?**

3026 6:28 Because::: uh:: right not uhmm (.3) because for me we're always exposed to:: to
3027 nutrients so:: and because uh::m cancer cells need uhm nutrients to grow so they have to be
3028 exposed

3029

3030 **CÉDRIC 13**

3031 24:19 **do you think that this question has been trivialized?**

3032 24:24 yeah yeah yes because you have some specificity when you need flow like to (.) to test
3033 for u:h (.) a lymphocyte and endothelial cell work condition (.) if you don't have the flow they
3034 will just grow on the cells and that's all but if you put some flow they will start rolling on the
3035 cells may be stopping so you need the flow sometime

3036 **PAUL 13**

3037 4:50 **and do you think that this question has been trivialized? Not many people think**
3038 **about it or take it for granted or ?**

3039 4:58 yes (.) clearly (.) people do not (.) they underestimate this point

3040

3041 **DALILA 13**

3042 3:27 **ah donc do you think that this question question has been trivialized? elle a été**
3043 **négligée ou personne ne considère son importance? comme il y a pas intérêt de de**
3044 **s'arrêter dessus?**

3045 3:38 non pas intérêt

3046 3:40 **donc elle a été trivialisée?**

3047 3:42 oui

3048

3049 **JOANNE 13**

3050 4:39 **ok (.) but do you think that this question has been trivialized? not considered to the**
3051 **all people take it for granted they do it like this and that's it?**

3052 4:52 Yes

3053 4:52 **why is such such a question (.) u:h may be there is an answer for that but why**
3054 **people don't think don't talk about about this although this is a central issue something**
3055 **that you don constantly that's not a detail that you do from time this is a constant work**
3056 **everywhere in any lab (.) why is people would consider would trivialize such an issue?**

3057 5:18 uhm well because you're always learning more complicated things (.) you will always
3058 try to understand the complicated things (.) and we always try to learn (.) and to get new
3059 things and you will you will not think about the: the basic (.) ↓ things wha: what you are
3060 doing here in the lab

3061 5:47 **and does this have consequences does is this a bad condition or a good condition**
3062 **wha wha how would you account for this?**

3063 5:55 ↑ Yes it's a b::ad thing but I think (.) there sh there should be I don't know if (.) I think
3064 ther there is some kind of people who are doing research in that (.) so what I mean is I think
3065 it's a good thing to have some people who will work on the basic things

3066 6:17 **uhum**

3067 6:17 and u:h they will try to understand u:h all this like temperature co2 medium stuff like
3068 that (.) and there there consequences of u::h the cells if there is some changements that
3069 happens inside the cell and you keep:: the complicated and other things and other research (.)
3070 for other people (.) but we have to be always in contact see?

3071

3072 **14. What is likely to happen if we can make the medium contact the cells in the same**
3073 **way as how the cells in the body contact the nutrients?**

3074

3075 **STEPHAN 14**

3076 31:11 **ok what is what is likely to happen if we can make the medium contact the cells on**
3077 **which you work in a way that is similar to how the cells in the body contact nutrients?**
3078 **what is the gain?**

3079 31:24 what is the gain?

3080 31:26 **if we adpot the system that allows (.) remember you talked [**

3081 31:29 **[So you have**

3082 31:29 **[= to me the other day about the: you said there is a process (.) that does that**
3083 **changes it's [**

3084 31:34 [Yeah (.) so you need to have those systems like pump medium and then replace it
3085 regular and you would get a more may be more realistic indeed mimicking u:h system of the
3086 body in that sense

3087 31:50 **what exactly realistic what is the gain**

3088 31:51 so because because you are (.) like any reaction is based equilibriums between different
3089 products that are being formed and (.) if too much products being formed may be then the
3090 reaction will slow down and (.) so if you remove those waste products then (.) so the reaction
3091 it will be more (.) more or less active (.) so you get difference

3092 32:20 **ok (.) on the other hand (.) can the permanent exposure to the medium cause a**
3093 **negative outcome to the research?**

3094 32:29 I think also yeah because some cells because now many times we're culturing cells so
3095 we call it in uh two two dJoannesional cultures so they are just next to each other but not on
3096 top of each other and also many cells it's also known if you grow them on top of each other
3097 more (.) like this in the body because you'll have (.) you're not flat you are you have volume
3098 and this this is by itself it will give them an induced effect (.)

3099 33:00 **you mean the medium doesn't reach the:**

3100 33:03 no (.) it's it's it's in a different way so may be the medium doesn't reach uh (.) in the
3101 body it's also we'd have to go may be from one cell to the other (.) to diffuse (.) so you have
3102 like different equilibrium states

3103

3104 **BRIAN 14**

3105 25:14 **ok (.) what is it like more (.) what is likely to happen if we can make the medium**
3106 **contact th cells on which you work in way that is similar to how the cells in the body**
3107 **contact nutrients? what I'm talking about is the process that would constantly change**

3108 **the medium and make u:h things flow instead of being constantly there (.) if this**
3109 **condition exist if this technique exist**

3110 25:46 It would be nice uh

3111 25:47 **why? (.) it would be nice ok why?**

3112 25:49 because it ill keep the levels more (.) in a more physiological way (.) the levels of
3113 oxygen nutrients it would be nice to control all this uh like in the human body yeah (.) it
3114 would be really(.) very nice (.) so you will not have this decrease in nutrients with time (.)
3115 because the medium will be renewed

3116 26:15 **but but a while ago you said that it's not necessarily important as long as we**
3117 **change after some time (.) after u:h five days or so (.) uh that's fine you said**

3118 26:28 it's ok because you you know when: you know the time the cells take to consume for
3119 example glucose

3120 26:39 **uhum**

3121 26:38 = ↓ glucose it takes 24 hours they decrease like the half all the concentration you put in
3122 the medium after 24 hours (.) if you change the medium it will be again (.) the same
3123 conditions (.) as you started (.) so: it's u:h (.) well it's the way we have (.) but it will be nice of
3124 course to have a system that is everytime injecting fresh medium taking the old one like in
3125 the human body

3126 27:09 **what what is nice? what is what is I mean the: added value? you said the other**
3127 **can [**

3128 27:13[the ad the added value is that the drop in nutrients will be lower well it will be not
3129 existent (.) you will have always the same parameters (.) the medium will have always the
3130 same concentration (.) of nutrients

3131 27:35 **ok**

3132 27:36 and this is a very good thing (.) of course

3133 27:40 **now (.) uhm can the permanent exposure to the medium cause a negative outcome**
3134 **to the research?**

3135 27:51 (0.3) if you don't change the medium the concentration of the components in the
3136 medium will change a lot so this can of course make an impact in the results (.) but as long as
3137 you take care of changing the medium regularly to having more or less the same
3138 concentration of components of the medium every time you do the experJoannet (.) I
3139 wouldn't say u:h a big problem (0.3) that is you know if (.) of course it will change a lot your
3140 results (.) very important

3141 29:30 = **for a sh:ort period of time (.) a reasonable period of time from the cells from the**
3142 **cancer cells you worry about humidity you worry about that the cells would die (.) the**
3143 **question is may the cancer would disappear before even the cells die (.) the cancer**

3144 29:52 I don't understand because

3145 29:53 **did you**

3146 29:54 = the cancer are cells

3147 29:54 **the cancer is just cells for you so that's actually the next ((laughter)) the chapter of**
3148 **or what is cancer itself (.) u:h so you consider that cancer is cell?**

3149 30:05 yeah they are cells that they grow differently they are not regulated like the others

3150 30:10 **but the cause is not known so there are may be this condition of not exposing the**
3151 **cells to the medium would make cancer or this abnormal multiplification of cells**
3152 **disappear or stop before even the cells die (.) so you worry about that the cells may die**
3153 **and you lose your your u:h**

3154 30:35 if the cells die the cancer will die ((laughter))

3155 30:40 **that's if the cells die (.) but if the cancer dies not necessarily or like when you test**
3156 **a drug may be the drug start to become efficient (.) kills the cancer but not the cells (.)**
3157 **the drug (.) so if you test the drug on on cells the drug**

3158 30:56 normally the the there are drugs

3159 30:58 **yes**

3160 31:00 that they are u:h mean meant to: to block the growing of cancer cells

3161 31:05 **yes**

3162 31:05 so they don't die but they don't grow

3163 31:10 **ah**

3164 31:10 there are (.) this kind of drugs

3165 31:11 **ok**

3166 31:12 they are called cytostatic (.) but the: 90% 99% of drugs they cytotoxic (.) they are

3167 meant to kill the cell

3168 31:22 **kill?**

3169 31:23 the cancer cell

3170 31:25 **ok kill the cancer cells (.)**

3171 31:27 yes

3172 31:27 **ok (.) not exposing the cells cancer cells to the medium for some time**

3173 31:37 yes

3174 31:37 **would not kill the cancer cells? as you said or block the cancer as you said? is that**

3175 **a possibility?**

3176 31:45 it could be

3177 31:46 **it could be (0.3) so for how long can we or are we allowed to leave the cells without**

3178 **medium? how much time for example**

3179 31:59 before

3180 31:58 **to make sure they don't die**

3181 31:59 to be sure they don't die (.) I would say::: one hour or so

3182 32:05 **one hour**

3183 32:07 2 hours

3184 32:08 **ok just to make sure that we understand each other (.) so suppose suppose that we**

3185 **try not to expose (.) to deprive the cells from any medium for less than an hour let's say**

3186 **fr half an hour**

3187 32:26 yes

3188 32:26 **is that suspected to block cancer or kill cancer cells? can that be**

3189 32:34 the thing is that (.) normally cancer cell are more resistant that the normal cells so you

3190 will kill (.) before your normal cells than your cancer cells and this is not good ((laughter))

3191 32:47 **ok (.) u:h but this experJoannet has been done?**

3192 32:54 yes yes (.) it's well described that cancer cells are more resistant to every kind of a

3193 stress

3194 33:00 **to every kind but to the fact that not being exposed (.) because uh**

3195 33:04 yeah really the thing the tumor (.) grow very fast and in the tumor that are not a blood

3196 vessels sometimes in the inside of the tumor because it's not growing at the same speed (.)

3197 there are some vessels around but inside tumor you don't have the blood vessel entering the

3198 tumor (.) so these cells are used to to be without medium without blood without nutrients and

3199 this make the tumor hypoxic (.) they don't have oxygen in the inside part of the tumor

3200 33:38 **yes**

3201 33:39 because there is no blood (.) and they this makes the tumor afterwards more u:h acidic

3202 (.) this also:: feature of so the tumor they are hypoxic and they afterwards they become acidic

3203 (.) this piece u:h (.) this makes the tumor cells (.) they are used to grow in this kind of

3204 34:02 **but also the tumor cells get u::h enriched or get u:h stronger by glucose and sugar**

3205 **right?**

3206 34:11 yes because when there is not oxygen

3207 34:12 **yeah**

3208 34:12 normal cells in the body they don't use a lot of glucose except the brain (.) and may be
3209 some other organs (.) but (.) when you have a tumor and there is no oxygen (.) there is not a
3210 possibility to:: to use the glucose in the cycle (.) and you have to do (.) like (.) which is
3211 independent from the mitochondrion (.) because (.) in the mitochondria this is u:h oxidative
3212 (.) so you need oxygen (.) and this is what normal cells they do (.) but tumor cells they don't
3213 do this and they sue glucose in another way and this is called glycolysis (.)

3214 34:59 **ok so they use glucose to [**
3215 35:00 produce energy

3216 35:02 **to produce energy instead of oxygen? because they are deprown deprived of oxygen**
3217 35:07 yes (.) because of there is not oxygen they use more glucose (.) ad they generate the
3218 same ATP

3219 35:12 **and if you stop the glucose and you stop all the medium**
3220 35:16 yeah

3221 35:16 **wouldn't that u:h how to say deprive from it from what it needs to grow as a**
3222 **cancer cell?**

3223 35:26 this is something that the the (.) yeah (.) there is a lot of experJoannets that uh re (.) you
3224 remove the glucose from the medium or you remove the glutamine from the medium and you
3225 remove the nutrients (.) then you check the effects in the tumor cells

3226 35:39**ok so now let's get back to the same question what would happen if you deprive**
3227 **the cells cancer cells from the medium for less than an hour? what do you expect to**
3228 **happen?**

3229 35:53 uh nothing

3230 35:54 **nothing you wouldn't have any consequence on the cancer cells or**
3231 35:58 uhm they will start to be damaged but I think if you put the medium again they will
3232 recover (.)

3233 **DILARA 14**

3234 13:20 **Ok (.) maybe you answered this question I don't know (.) why is it like (.) what is**
3235 **likely to happen if you can make the medium contact the cells on which you work in a**
3236 **way that is similar in the way the body contact nutrients? SI on parle maintenant du**
3237 **flow qu'est ce qu'on à quoi on s'attend quelles différences on peut**

3238 13:46 Si maintenant on met les cellules in vitro avec un flow

3239 13:50 **Un système de flow oui**

3240 13:53 La différence euh pour moi ce serait à nouveau la réduction de la culture in vitro à une
3241 seule couche de cellule parce que dans le corps humain tu as donc tes cellules qui sont
3242 organisées en 3 D et ici on est qu'on 2 D donc pour moi il ya encore une petite faiblesse à ce
3243 niveau là c'est qu'il nous manque une dJoannesion (0.3) dans le sens où à priori la plupart des
3244 cellules ont un vaisseau sanguin pour alJoanneter la cellule mais dans certains cas tu vois t'as
3245 une cellule là une cellule là et le vaisseau qui est seulement là et donc du coup les
3246 nutrJoannets doivent passer au travers une cellule ou entre les cellules alors qu'ici on
3247 vraJoannet une couche de cellules et toutes les cellules sont en contact avec le milieu qui
3248 mime le sang (.) et donc MAINTENANT il y a de nouveau euh des nouveaux types d'études
3249 qui sont faits sur des coupes 3D pour garder justement ces structures 3 dJoannesionnelles

3250 15:08 **C'est par rapport à l'accès par exemple de la drogue**

3251 15:12 oui

3252 15:12 **Parce que en 3 dJoannesionnelles c'est plus difficile et donc il faut mimer la**
3253 **difficulté de l'in vivo ?**

3254 15:19 oui oui

3255 15:21 **d'accord... Can the permanent exposure to the medium cause a negative outcome**
3256 **to the research? Le fait que ces cellules ont constamment dans les milieu est ce que tu**

3257 **peux imaginer a negative outcome? Tu peux penser à à des conséquences négatives par**
3258 **rapport à ce constat à ce qui se passe maintenant?**

3259 16:00 là c'est une question piège ? hhh ((laughter))

3260 16:00 ((laughter))

3261 16:03 ça c'est une question que je me suis jamais posée par ce que durant ma thèse j'ai fait
3262 face à des problèmes et pour moi ça c'était la solution mais je pense que il y a certainement (.)
3263 il y a certainement des oui des problèmes des des inconvénients à ce système au niveau
3264 cellulaire je sais pas trop maintenant au niveau logistique ça demande beaucoup plus de
3265 milieu beaucoup plus d'énergie c'est plus coûteux en fin ce genre de chose mais ça c'est au
3266 niveau logistique mais au niveau des cellules je sais pas je sais pas je ne me suis jamais posée
3267 la question et je ne trouve pas de réponse

3268 16:47 **Par exemple tout à l'heure tu disais que en fin il y a l'échange gazeux qui se fait et**
3269 **donc le fait que le milieu est là qu'on change pas par exemple c'est vrai tu as dit que**
3270 **ça coûte etc. mais indépendamment de ça le fait que l'échange gazeux se fasse et que le**
3271 **milieu reste sur place je sais pas 3 jours pour changer ou une semaine des fois et donc ça**
3272 **peut être négatif ou non? Puisque chez l'être humain l'échange gazeux se**
3273 **automatiquement il est dégagé c'est ça non?**

3274 17:23 oui c'est quelque chose qui se fait plus instantanément et ici le fait de mettre le milieu
3275 en mouvement c'est pas un torrent donc il faut pas non plus ((laughter))

3276 **17:36 non non je veux dire le le tel qu'on le fait maintenant c'est pas le**

3277 17:40 AH QU'ON LE FAIT MAINTENANT? Je pensais que t'étais avant

3278 **17:43 Non non**

3279 17:44 AH les effets négatifs de ce qu'on fait maintenant?

3280 **17:45 oui tout à fait**

3281 17:47 ah oui oui ah oui oui il y en a plein il y en a plein on est d'accord oui oui oui il y a en
3282 fait justement de ne pas renouveler suffisamment suffisamment le milieu c'est ça reste en
3283 contact trop longtemps avec les cellules et ça ne mime pas ce qui se passe réellement dans le
3284 corps donc ça c'est le fait de renouveler le milieu et puis alors le deuxième aspect c'est
3285 l'aspect tridimensionnel qu'on a perdu les cellules dans les plaques de culture ou les
3286 flasques sont en 2D c'est juste un tapis cellulaire alors qu'en vrai c'est du 3D et là on perd
3287 toutes les interactions qu'on peut avoir avec les différentes euh entre les différentes cellules et
3288 alors le 3^{ème} aspect auquel j'ai pensé c'est aussi que c'est fort restrictif dans le sens où la
3289 plupart du temps on a qu'un seul type cellulaire alors que chez l'être humain on a plusieurs
3290 types cellulaires (.) maintenant c'est l'organe (.) tu vois si t'as la cellule tu vas avoir tes
3291 cellules puis à côté tu vas avoir ton vaisseau sanguin mais le vaisseau sanguin il est fait aussi
3292 de cellules (.) et donc t'auras les cellules du vaisseau sanguin plus euh

3293 19:00 **un autre type de cellule**

3294 19:03 oui

3295 19:03 **d'accord**

3296 19:03 et les cellules communiquent entre elles et ça c'est cette communication qu'on a pas ici
3297 dans nos nos cultures

3298

3299 **GAELE 14**

3300 7:08 **ok (.) now what is likely to happen if we can make the medium the cells on which**
3301 **you work in a way that is similar to how the cells in the body contact nutrients (.) for**
3302 **example another way that makes the medium goes through the cells from time to time**
3303 **in a cyclic way for example not constantly there**

3304 7:36 like was blood flow ?

- 3305 7:41 **Like I suppose how we take nutrients when we need when the cells need nutrients**
- 3306 **like you said from the fat or the it takes they take**
- 3307 7:49 but they I think that the cells in our body most of the time I talk for cancer cells or from
- 3308 normal cells also both
- 3309 7:59 **both**
- 3310 7:59 both u::h the:: I think that the cells need most of the time nutrients to: be effective in the
- 3311 function that they have (0.3) I don't remember the question ((laughter))
- 3312 8:24 **the fact that I presupposed**
- 3313 8:27 Yes
- 3314 8:26 **I presupposed that the cells on which you work need to be exposed to the medium**
- 3315 **from time to time but not constantly (.) not constantly in the medium swimming in the**
- 3316 **medium (.) may be they need some rest (.) may be they need a cycle may they need a**
- 3317 **system that can get**
- 3318 8:48 I thought that I think that a system which could be nice because in when we expose with
- 3319 the medium (.) uh they take some nutrients and after two hours for example the concentration
- 3320 for example will not be the same as before which could be nice if a system with of flux?
- 3321 9:06 **uhm**
- 3322 9:06 flow?
- 3323 9:08 **uhum**
- 3324 9:07 and it'll be renewed like with the blood
- 3325 9:19 **for example one of your colleagues mentioned that there is already a system**
- 3326 9:24 yeah I hope
- 3327 9:23 = **but it's expensive**
- 3328 9:25 I heard about it also (.) but I don't
- 3329 9:25 **that makes it flow right?**

- 3330 9:30 yeah
- 3331 9:32 **but when when I talked to you at the beginning you said that this is not important**
- 3332 **because it's already the cells in the body are constantly**
- 3333 9:38 but it will be also constantly (.) the difference the difference will be that uh it will be the
- 3334 same concentration at each time
- 3335 9:50 **uh it's a matter of concentration you mean uh**
- 3336 9:54 yeah
- 3337 9:57 **now I understand what you said earlier**
- 3338 9:57 yeah ok
- 3339 9:57 **you said that you for you this issue is concentration**
- 3340 10:01 yeah
- 3341 10:02 **ok (.) ok now I'll put the question in another way can the permanent expose to the**
- 3342 **medium cause a negative outcome to the research?**
- 3343 10:15 because for example (.) if u::h there is not enough glucose in the media (.) the cells will
- 3344 not growth and may be die so:: (0.2) we need to have the right concentration of each
- 3345 nutrient
- 3346 10:45 **and this is because there is a permanent exposure to the medium question**
- 3347 10:53 uh the
- 3348 10:52 **can the permanent exposure to the medium cause a negative outcome to your**
- 3349 **research?**
- 3350 11:00 so just u::h to:: if we:: I don't understand
- 3351 11:08 **uh**
- 3352 11:09 it's just if don't
- 3353 11:10 **the fact that the cells are permanently exposed to the medium like the you're**
- 3354 **doing now (.) can that be**

3355 11:17 I now from I now it was the opposite (.) if it was not exposed (.) yeah that's what I
3356 give
3357 11:26 **yeah no I**
3358 11:26 it's
3359 11:27 = **I can repeat the question (.) can the permanent exposure to the medium like**
3360 **you're doing now**
3361 11:31 yeah
3362 11:30 **that permanently in the medium can that be a negative condition or have a**
3363 **negative outcome to your research? it will mislead you or make you not really mimic the**
3364 **body**
3365 11:49 u::h may be it will right I u::h if we don't (.) for me:: it will no it would be the
3366 opposite
3367 if we don't give the media to the cells with all the nutrients the cells would die
3368 12:13 **that's ok I understand that but now if you constantly give them the medium**
3369 **they're constantly swimming in the medium would that be a problem an issue?**
3370 12:23 no
3371 12:23 **no?**
3372 12:23 the opposite for me would be a problem
3373 12:25 **ok (0.2) so for example if you compare what you're doing now to the other system**
3374 **that you talked about a flow**
3375 12:37 yeah
3376 12:36 **the medium is flowing instead of the cells swimming in the medium which better?**
3377 12:42 it would be better the flow because the concentration would be constant
3378 12:49 **so that they are constantly in the medium is a problem right?**

- 3379 12:55 yes but you were saying constant compared to I thought it was compared to you put the
3380 medium and sometimes you have not using
- 3381 13:05 **uh let's say compare constant to flow**
- 3382 13:11 Compared to flow for me the flow is better because the concentration will be always
3383 the same and there will be a renewal of the:: the medium
- 3384 13:21 **so there is a problem with the constant as compared to the flow**
- 3385 13:25 yes
- 3386 13:25 **what kind of problem?**
- 3387 13:26 the concentration of the nutrients
- 3388 13:30 **((laughter)) ok**
- 3389 13:36 and the pH also
- 3390
- 3391 **CÉDRIC 14**
- 3392 25:11 **((typing for 0.17)) ok (.) what is likely to happen if you can make the medium**
3393 **contact the cells on which you work in a way that is similar to how the cells in the body**
3394 **contact (.) nutrients like for example this technique of flow ? what is like to happen?**
- 3395 25:27 It may be a better model
- 3396 25:30 **u:h?**
- 3397 25:29 it may be a better model like u:h this is the example for the flow but I know that you
3398 have some u:h some matrice for some cell (.) they are selling the matrice and then you have
3399 may be better gradient of nutrient like in the body but yeah I'm not sure about the importance
3400 of this
- 3401 25:54 **ok and now to go back to this same question can the permanent exposure to the**
3402 **medium cause a negative outcome to the research?**

3403 26:05 yeah yeah it depend of what you're working on I guess (.) it always depend of what
3404 you're working on (.) if you're working on this on like diabetc stuff with problem of er
3405 glucose concentration in the body 5.) and you're trying to redo that in the lab (.) you don't
3406 want to have constant exposure of the cell may be you want to pick up a glucose or stuff like
3407 that (.) then you can do that in the lab (.) you just put high glucose concentration for one hour
3408 just leave the cell like that come back change the medium put it back the way it was before
3409 and you got a non constant medium in your cell (.) so it's possible to do that

3410 **PAUL 14**

3411 5:06 ok (.) what is likely to happen if we can make the medium contact the cell lines in a
3412 way that is more similar to how the cells in the body contact nutrients? what is the
3413 benefit of that? to pay more attention to

3414 5:20 well to be closer to to the true life and therefore to u:h to have cells mimicking u:h the in
3415 vivo situation (.) so to limit the or to to have a model (.) u:h better reflecting the the in vivo
3416 situation so the the phenotype of the cell should be (.) in such a way that it could act (.) u:h it
3417 could develop the same u:h signal transduction (.) the same response to to drugs and therefore
3418 it could be a better way to anticipate how the the (.) the organism the body will (.) will react

3419 6:03 can you (.) can the permanent exposure to the medium cause negative outcome to
3420 the to the research? if the medium is permanently there and like that

3421 6:21 (0.4) well you you need them you need anyway to have the medium (.) a certain level of
3422 medium and nutrients present u:hm (.) it's clear that the cells will not be the same after 4 days
3423 culturing the same the same medium (.) u::h we show for instance that after six seven days
3424 the cells if you do not change the medium (.) they sta start to recapture the ways product that
3425 has been released in the first days (.) so lactate or something released weekly (.) you have
3426 more and more lactate in () medium and after six seven days you that the lactate is captured
3427 by the cells to be u:h to extract the the energy left in the molecule (.) so if you test a molecule
3428 at the beginning or at the end it can make a big change

3429

3430 **DALILA 14**

3431 3:52 ah ok what is likely to happen if we can make the medium contact the cells on
3432 which you work in a way that is similar to how the cells in the body contact nurtients?
3433 donc tu as dit que c'est pas tip top que c'est de toutes façons il y a des artefacts (.)

3434 4:11 oui

- 3435 4:11 **que c'est ce qu'on peut faire (.) et on est pas ca: vraJoannet capable do faire**
- 3436 **exactement il se passe dans le corps humain mais**
- 3437 4:18 en fin ça devient très fort compliqué quoi
- 3438 4:19 **voilà (.) mais on imagine théoriquement si c'était possible si c'était possible de le**
- 3439 **faire d'une manière plus plus similaire à comment ça se passe dans le corps est ce que**
- 3440 **est ce que ça a une importance?**
- 3441 4:36 pourquoi pas? le but c'est de se rapprocher quand même un maximum de ce qui se passe
- 3442 dans le corps (.) tout en restant u::h il faut que ça reste quand même faisable et u::h
- 3443 4:54 **donc tu réfléchis plus**
- 3444 4:55 = et que ça et que ça ça ne limite et que ça ne limite pas les expériences tout ce qu'on
- 3445 peut en faire quoi
- 3446 5:02 **d'accord (.) un de tes collègues m'avait parlé qu'il y a quand même un système un**
- 3447 **autre système de de culture qui consiste à un f euh we call flow comment dirai je un il ya**
- 3448 **un flow**
- 3449 5:14 oui oui
- 3450 5:14 **donc finalement**
- 3451 5:16 différence non? ((laughter)) non?
- 3452 5:16 **non c'était u:h ouais j'ai parlé avec Gaelle aussi**
- 3453 5:21 oui ce système d'injection là
- 3454 5:22 **c'est Stephan qui m'avait euh**
- 3455 5:24 oui
- 3456 5:24 **donc les cellules finalement dans ce cas**
- 3457 5:27 elles sont sou soumis à un flux avec des nutrJoannets et des choses comme ça
- 3458 5:31 **voilà qu'est ce que tu en penses? Pourquoi ces gens là ont pensé à ça d'abord?**

- 3459 5:36 ben par ce qu'ils étudient euh ((laughter)) le le la l'effet des différents nutrJoannets sur
3460 les cellules et sur le flux les vaisseaux sanguin et les choses comme ça
- 3461 5:53 **Gaelle par exemple a dit que u:h u:h la concentration des composants**
- 3462 6:01 oui
- 3463 6:02 = **dans le milieu est importante**
- 3464 6:03 oui
- 3465 6:06 **combien de telle ou telle composante**
- 3466 6:09 oui
- 3467 6:11 = **consomment les cellules**
- 3468 6:13 oui ça c'est oui plus l'étude du métabolisme
- 3469 6:16 = **alors quand on fait des recherches on a des cellules comme ça tout le temps 24**
3470 **sur 24 u:h**
- 3471 6:22 oui mais on change le milieu quand même
- 3472 6:24 **oui mais**
- 3473 6:26 elles sont pas dérivées
- 3474 6:25 **oui mais la concentration**
- 3475 6:29 ah oui
- 3476 6:27 **de la composante**
- 3477 6:29 après:: le but justement ici comme on étudie le métabolisme fin on met un composant A
3478 à temps zéro et on regarde u:h je sais pas moi à temps 72 heures u::h ce qui a été consommé
3479 en composant A donc pour nous ça nous (0.4)
- 3480 6:50 **donc les cellules puisqu'elles consomment aussi**
- 3481 6:52 voilà par exemple le glucose tu on met du glucose sur la cellule la cellule va consommer
3482 glucose puisque c'est un nutrJoannet après généralement nous ce qu'on étudie c'est la
3483 consommation du glucose à un temps zéro on met 10 milli molaires à temps 72 heures on voit

- 3484 qu'il en reste 8 ben on sait qu'elle a consommé 2 milli molaires (.) donc c'est bien d'un coté
- 3485 qu'on ait cette fin cette possibilité de mettre en temps X telle concentration pour voir après ce
- 3486 qu'elle consomme mais puisque nous c'est on étu on étudie le métabolisme
- 3487 7:22 **donc c'est bien**
- 3488 7:22 oui c'est bien
- 3489 7:24 **de faire ce système de fl de flux**
- 3490 7:25 oui de voir comment la cellule elle agit et tout maintenant parce que s'il y a un flux
- 3491 constant on sait pas voir si tous mes cellules ont un flux constant pour vivre alors on sait pas
- 3492 utiliser il y a des études qu'on sait pas faire
- 3493 7:38 **et donc il y a il y a intérêt à**
- 3494 7:42 ça dépend ce qu'on étudie pour moi
- 3495 7:45 **mais vous le faites jamais ça ici?**
- 3496 7:47 non puisque ça nous on étudie pas ça (.) nos cellules on veut qu'elles prolifèrent on veut
- 3497 qu'elles poussent on veut u:h on les passe u:h deux à trois fois par semaine (.) nos milieux
- 3498 pour qu'elles aient suffisamment que pour rester en vie et puis après:: le but c'est que (.)
- 3499 d'avoir des cellules pour après travailler (.) si on commence à faire (.) si après ils ont un
- 3500 système automatisé ou d'un seul fflow qui est fait régulièrement et tout et que c'est hyper
- 3501 pratique (.) et que les cellules le supportent et sont mieux pourquoi pas mais il faut (.)
- 3502 finalement c'est du truc qui coûte cher (.) c'est beaucoup d'énergie alors que: au final eu:h (.)
- 3503 8:24 **Bon je repose la question d'une autre manière (.) can the permanent exposure to**
- 3504 **the medium cause a negative outcome to the research? Le fait que les cellules sont en**
- 3505 **permanence dans le milieu peut biaiser un peu la recherche?**
- 3506 8:40 tu voudrais qu'elles soient dans quoi?
- 3507 8:43 **pardon?**
- 3508 8:44 tu voudrais qu'elles soient dans quoi? (.) à part le milieu?

- 3509 8:47 **non mais j'ai dit en permanence comme ça euh les mêmes concentrations**
- 3510 8:53 ah (0.6)
- 3511 9:02 **Le fait que (.) tu disais que de toutes façons il y a des artefacts on est vraJoannet**
- 3512 **pas exactement comme le corps humain que c'est vraJoannet différent en quelque sorte**
- 3513 **différent de ce qui se passe dans le corps humain**
- 3514 9:13 vous voyez c'est pour ça qu'on passe à l'in vivo par après pour
- 3515 9:17 **avant de passer avant de passer mais on peut ne pas passer à hh l'in vivo puisque**
- 3516 9:20 Pourquoi? Ici pas le but c'est d'avoir quelque chose qui fonctionne chez l'être humain (.)
- 3517 donc on passera d'office en in vivo
- 3518 9:28 **Non mais si la recherche ne ne**
- 3519 9:30 Ah oui n'aboutie pas?
- 3520 9:31 **n'aboutie pas on ne passe pas**
- 3521 9:34 Non on ne passe pas (.) peut être qu'on manque des informations importantes (.) sais pas
- 3522 9:41 **donc le fait que ça ne soit pas exactement comme le corps humain ça peut louper**
- 3523 **euh**
- 3524 9:48 Oui je pense
- 3525
- 3526 **JOANNE 14**
- 3527 6:58 **uhum (0.4) ok (.) what is likely to happen if we can make the medium contact the**
- 3528 **cells on which you work in a way that is similar to how the cells in the body contact**
- 3529 **nutrients and I'm here talking about as an example that your colleagues mentioned**
- 3530 **there is actually a system of flow (.) that gets the medium flows through the cells and are**
- 3531 **it's not all the time there because there is another issue that one of your colleagues**
- 3532 **actually mentioned is the concentration of u::h**
- 3533 7:48 the cells?

3534 7:48 **concentration of u:h whatever that you want to give to the cells for example glucose**
3535 **or [**
3536 7:54[ah you mean yes yes
3537 7:55 = **lipides glucides so there is an issue of concentration how much (.) so may be 2 or**
3538 **3 of your colleagues said there is a system a system of flow that gets the the: the medium**
3539 **flowing instead of being constantly there what what is like to happen if you have a**
3540 **system like that?**
3541 8:21 I don't have any idea (.)
3542 8:28 **ok but why do you think people thought of this system? of this n: new way or**
3543 **different way of doing u:h you know exposing the medium (.) in a different way? or**
3544 **trying to expose the medium to cells in a nearer er better way that is more that is nearer**
3545 **to how cells in the body consume (.) nutrients? why they're thinking about this?**
3546 9:03 To make it more near to the reality (.) to think about such a thing it's good to put the
3547 cells in what they are in reality
3548 9:22 **but when I mentioned I don't mention this new system of flowing**
3549 9:26 I don't I don't know about it
3550 9:28 **Yeah people immediately say that's how it works in the body they say ok yeah of**
3551 **course you see the cells in the medium constantly but they take from time to time like**
3552 **the body take from time to time but they when you mention (.) this system they say ok**
3553 **this system is nearer (.) there is a necessity to move to this system (.) they only realize**
3554 **that there is this necessity of this new flowing system only when we talk about it (.) when**
3555 **you first mention why (.) is the medium constantly there they say that's how it happens**
3556 **in the in the body (.) why people don't don't say from the beginning that actually the**
3557 **way we culture cells we put them in the medium is not exactly how it happens in the**
3558 **body?**

3559 10:20 I don't know what I said is we put the medium and the cells need it will take (.) because
3560 we don't ((laughter))

3561 10:28 ((laughter))

3562 10:28 we don't know when the cells will need what they want (.) so may be there were u:h
3563 experJoannets they did to know at what time the cells will need the food so they put this
3564 flowing system

3565 10:49 **but they're saying the flow is all all the time flowing actually (.) it's all the time**
3566 **flowing (.) but because there is a matter of concentration how how how much u:h lipids**
3567 **or whatever so the flowing system ensures that the concentration is very well u:h yiu**
3568 **know regular (.) how it meets the cells**

3569 11:13 I don't have any idea about this system

3570 11:15 **Ok (.) ok can the permanent exposure to the medium cause a negative outcome to**
3571 **the research?**

3572 11:26 uhm (0.3) may be I don't know (.)

3573

3574 **15. Do you think that the cells need to spend some time without any medium?**

3575

3576 **STEPHAN 15**

3577 33:21 **do you think that the cells need to spend spend some time without any medium (.)**
3578 **even a short time?**

3579 33:29 u:h (.) even a short well it will induce some kind of stress on the cells so (.) uh if you
3580 would have it to be reproducible ((laughter)) I think you'd better not to do this too long (.)
3581 anyway (.) so but if you would want to induce stress in this ways you will have to do it
3582 always in the same amount because many: (.) because if they don't get medium (.) if they get
3583 so much starved (.) it will induce stress and it might affect your research outcome

3584 34:03 **ok wouldn't that stress the cancer cells before the normal cells?**

3585 34:10 u:hm it would stress all sorts of cells so no difference on the one before the other (.)

3586 although cancer cells might may be because if they're more active more rapidly growing (.)

3587 they would be going more affected but

3588 34:28 **if it's usually said (.) I'm not sure this is true (.) that cancer cells are resistant**

3589 **because they get sugar right?**

3590 34:37 Yeah

3591 34:38 **and if you deprive them from the medium (.) wouldn't that be a way to uh to put**

3592 **them on stress and to the: get them to: to weaken and**

3593 34:50 To weaken yes that's also uh true so yeah so indeed you can uh try: to use those

3594 methods for weakening the cancer cells but it's also if you remove u:h nutrients also other

3595 cells they will also become affected and they start to run a processes in which they consume

3596 like their own structures and (.) I will be surprised that cancer cells are more efficient in

3597 reutilizing their own structures and otherwise may be u:h destroy more surrounding tissue (.)

3598 I'm not sure about that but (0.2) so I I I wouldn't know I don't know exactly how that would

3599 affect it than indeed if you would starve the cancer cells before the other ones (.) for some

3600 cancers it might work but more others it might not (.) because you also do damage other

3601 tissue around it (0.3)

3602

3603 **BRIAN 15**

3604 28:37 **do you think that the cells need to spend some time without any medium?**

3605 28:44 without any medium?

3606 28:44 **yes**

3607 28:45 no (.) no because uh in the body you have always humidity and if you remove the

3608 medium from the cells (.) they will dry and this is a normal physiological condition

3609 29:01 **ok we're talking about the cancer cells here (.) cancer cells?**

3610 29:05 yeah or

3611 29:05 **not even cancer cells who are**

3612 29:10 no (.) cancer cells you know are inside the body (.) we are there is always a humidity

3613 and water around so (.) if you remove the medium they will dry

3614 29:21 **no I mean the cancer itself may be would before the cells die**

3615 29:27 I don't

3616 29:28 **if you remove the medium (.)**

3617 29:29 yes

3618

3619 **DILARA 15**

3620 19:11 mmuhum (.) **do you think that the cells need to spend some time without any**

3621 **medium**

3622 19:15 non

3623 19:16 **pas du tout?**

3624 19:17 nhhhon ((laughter)) phhas du tout

3625 19:19 **même pas même pas quelques minutes?**

3626 19:20 non (.)

3627 19:21 **Qu'est ce qui peut arriver?**

3628 19:23 Qu'est ce qui peut arriver (.) eu::h (.) les cellules que je cultivais quand on les laissais à

3629 l'air libre elles mourraient ou alors elles (.) explosaient (.) ces des cellules qui sont gorgées de

3630 lipides et donc euh comme elles sèchent la membrane je pense doit s'affaiblir ou chépa ce qui

3631 se passe exactement mais du coup elles explosaient

3632 19:46 tu **disais à l'air libre mais tu peux les garder dans l'incubateur par exemple sans**

3633 **sans sans milieu [**

- 3634 19:52 oui mais ça reste l'air libre.. fin [
- 3635 19:54 ça reste [
- 3636 19:55 ah oui
- 3637 19:58 **d'accord et donc c'est [**
- 3638 19:58 non
- 3639 19:59 **Question de quelques minutes ça [**
- 3640 20:01 Ah oui pour moi
- 3641 20:01 **ça s'explose?**
- 3642 20:02 oui (.)
- 3643 20:04 **ça**
- 3644 20:04 ça explose dans le cas des () toutes les cellules ne s'explohhhsent pahhhhs
- 3645 ((laughter))
- 3646 20:08 **oui mais dans le sens (.) mais est ce que c'est euh ça c'est par rapport aux cellules**
- 3647 **primaires?**
- 3648 20:14 oui
- 3649 20:16 **et ces cellules là (.) comme on appelle ces cellules en français?**
- 3650 20:18 les lignées (.) cellulaires
- 3651 20:20 **ah immortalized c'est pour ça qu'on appelle [**
- 3652 20:22 ces des cell lines
- 3653 20:23 **cell lines mais quand on dit immortalized immortalisés c'est ça?**
- 3654 20:26 Elles sont immortalisées parce que ce sont des cellules cancéreuses
- 3655 20:29 **Ah**
- 3656 20:30 Et donc les cellules cancéreuses bien elles se divisent un peu à l'infini (.) elles ont un
- 3657 métabolisme qui fait qu'elles sont (.) qu'elles se divisent elle grandissent ((noise)) et donc
- 3658 toutes les cellules qui sont euh [

3659 20:45 **et donc si on travaille par entre parenthèses si on travaille sur des drugs des**
3660 **médicaments puis on essaye de savoir enfin les l'aspect thérapeutiques de ces**
3661 **médicaments ou tester l'aspect thérapeutiques si elles sont immortalisées comment on**
3662 **peut le savoir puisque ces cellules sont [**

3663 21:01 on fait le premier objectif quand on développe un médicament c'est pas de voir si les
3664 cellules meurent (.) c'est de voir quelle est l'action de la molécule que tu testes sur le
3665 métabolisme donc dans la cellule il y a plein de réactions qui se font et donc on veut voir sur
3666 quelle réaction la molécule va agir (.) et donc finalement les cellules immortalisées c'est la
3667 même chose qu'une cellule normale sauf qu'il y a quelques réactions qui sont différentes et
3668 qui permettent justement à la cellule de d'être immortelle (.) mais sinon toutes les autres
3669 réactions sont les mêmes (.) et donc quand on développe un médicament le but premier c'est
3670 de dire ah ben voilà ma molécule elle agit sur telle telle réaction (.) et ça c'est la première
3671 chose à faire il faut [

3672 21:49 ()

3673 21:50 = ↑ voir comment ça agit

3674 21:51 **Comment on dit protein expression c'est ça? telle action**

3675 21:55 Oui se passe oui

3676 21:56 **c'est ça?**

3677 21:56 oui

3678

3679 **GAELE 15**

3680 13:40 **ok don't you think that the cells need to spend some time without any medium?**

3681 13:43 no (.) they will die

3682 13:47 **they will die?**

3683 13:48 without medium?

- 3684 13:49 **uhm**
- 3685 13:50 yes
- 3686 13:51 **is that**
- 3687 13:53 if it's if it's if:: it's like if you let them 2 seconds without medium there is not a problem
- 3688 but if you let them one week without medium they will die even one day they will die
- 3689 14:11 **a couple of hours**
- 3690 14:13 it depends type of cells but yes
- 3691 14:25 **if cancer is a molecule (.) so is it a molecule cancer as a sickness?**
- 3692 14:31 no
- 3693 14:32 **no?**
- 3694 14:32 a moleclue? une molécule?
- 3695 14:32 **yeah cancer cannot be a molecule?**
- 3696 14:37 cancer is u::h
- 3697 14:39 **as a sickness you said as causing (.) I finish my question if cancer is a molecule**
- 3698 **that is causing a problem in the regulation of the cell multiplication so cancer is a**
- 3699 **problem of proliferation**
- 3700 14:57 yeah
- 3701 14:56 **in the cell multiplication right**
- 3702 14:58 yeah
- 3703 15:01 **but what in exactly is it a molecule that is causing this proliferation or what?**
- 3704 15:07 there are
- 3705 15:10 **wouldn't that molecule stay (.) so first let's say can it be a molecule?**
- 3706 15:14 it's u: the canc there are different causes of cancer
- 3707 15:21 **uhm**

- 3708 15:20 it could be like because you are exposed continuously to a type of uh:: u::h chemical
3709 like::: pétrole
- 3710 15:31 **uhm**
- 3711 15:34 and so on (.) it could be u:::h to high radiation (.) une radiation?
- 3712 15:40 **radiation**
- 3713 15:42 radiation u::h mutation spontaneous mutation
- 3714 15:49 **yeah all that is a is a u::h you're describing the condition**
- 3715 15:57 yeah
- 3716 15:56 **but what happens exactly in the**
- 3717 15:59 it's
- 3718 16:00 **is it a molecule that it's**
- 3719 16:02 its u::h it's different for example fo::r it's because there'll be uh damage to DNA
- 3720 16:12 **uhm**
- 3721 16:14 and so it will u::h will there so u::h mutation and so the cells are proliferating u::h
- 3722 16:25 **but this damage in the DNA you already know it or just**
- 3723 16:30 what is damaging?
- 3724 16:31 **yeah**
- 3725 16:30 there are different causes for example the radiations
- 3726 16:36 **but it causes cause what?**
- 3727 16:37 because the high radiation can break your DNA
- 3728 16:42 **yes**
- 3729 16:43 and so if you break your DNA it's u::h not well regulated anymore and so the cells
3730 proliferate u::h
- 3731 16:52 **yeah but this you're describing the condition is it (.) is it can that be a molecule**
3732 **that is doing that but you don't know it?**

- 3733 17:01 may be
- 3734 17:02 **so there is a possibility that it can be k (.) because one of your colleagues said it**
- 3735 17:06 is but the for eg the high radiation is directly high radiation is doing this but with uh the
- 3736 the pétrole?
- 3737 17:17 **uhm the chemical uh yeah the oil and or petroleum**
- 3738 17:22 yes (.) for sure that there is a molecule which is doing the damage
- 3739 17:26 **uhuh so there is a possibility that cancer can is a molecule?**
- 3740 17:29 the cancer is a molecule? no the cause but not the cancer is not a molecule
- 3741 17:35 **oh yeah yeah a molecule that is causing this proliferation**
- 3742 17:41 yes
- 3743 17:42 **right? so**
- 3744 17:45 because it's it's something in the cells
- 3745 17:52 **ok I understand that you**
- 3746 17:52 but it's it's but it's a molecule but it's a molecule for example of a u::h cervix cancer and
- 3747 so on
- 3748 18:02 **uhum**
- 3749 18:05 it's a virus who cause this
- 3750 18:06 **or virus**
- 3751 18:07 it's yeah
- 3752
- 3753 **CÉDRIC 15**
- 3754 26:53 **ok do you think that the cells need to spend some time without any medium?**
- 3755 26:58 no it's no good for them
- 3756 27:03 **not even for how long? not even for a couple of hours? not a**

3757 27:07 I guess if you do that you (.) put a big stress on the cell (.) like for example a service
3758 supposed to have u::h (.) uh osmotic pressure so if you have the cell and water outside (.) if
3759 the highly concentration of the water is not the same inside the cell and not outside (.) you
3760 would have a flow movement between the cell and the inside so if you just remove the
3761 medium (.) you will have the cell full of water and the outside may be the water would just
3762 start going out or stuff like that I guess

3763

3764 **PAUL 15**

3765 7:20 **don't you think that the cells need some to spend some time without any medium?**

3766 7:29 (0.2) cells need to bath to be to bath in in medium otherwise they will dry and die so you
3767 always need to have a medium (.) available u:h it can be u:h it can be basic medium like a
3768 salt solution for a perdioid of time but I do not see the interest to to remove everything (.) to a
3769 little bit tune the medium to consider that the the glucose is not always u:h at () minimal but
3770 because of starvation due to a treatment or due to a period of the of the life of the tumor (.)
3771 where there is less blood vessel brining less nutrients (.) then it can reflects the reality also (.)
3772 so even in vivo the cells should take u:h cancer cells they are not always exposed to the same
3773 amount of medium if you take a cell in the u:h in the heart or in the lung (.) there it's more
3774 physiologic:::al u::h context (.) so there you you are more you may expect less variation in
3775 the amount of u:h of fuels available

3776

3777 **DALILA 15**

3778 9:55 **Ok don't you think that the cells need to spend some cancer cells uh**

3779 10:00 uhum

3780 10:00 = **on wihch you work (.) par exemple les cellules dont avec lesquelles euh (.) tu**
3781 **teste des médicaments u: des thérapies**

- 3782 10:07 ouais
- 3783 10:09 **Je par de ça (.) don't you think that these cells need to spend some time without**
- 3784 **any medium ? Un peu de temps sans sans milieu**
- 3785 10:18 ((coughing or laughter)) comme ça sans milieu toute sèche?
- 3786 10:22 **Par exemple: je dirais eu:h 15 minutes**
- 3787 10:28 Dans de l'eau? dans du physio?
- 3788 10:29 **Non rien rien**
- 3789 10:30 Rien du tout
- 3790 10:32 **uhm**
- 3791 10:32 Si elles vont continuer à vivre après?
- 3792 10:34 **oui**
- 3793 10:35 Chai pas généralement quand je mets pas de milieu après u:h je jette à lahh poubehhllle
- 3794 ((laughter))
- 3795 10:41 **ah directement tu jettes à la poubelle?**
- 3796 10:44 oui parce que si j'obtiens le milieu c'est qu'elle n'a plus besoin si ben non chai pas
- 3797 combien de temps ça peut rester comme ça sinon
- 3798 10:50 **tu sais pas combien donc euh::**
- 3799 10:51 Chai pas (.) Je vois pas l'intérêt en fait (.)
- 3800
- 3801 **JOANNE 15**
- 3802 11:41 **do you think that the cells need to spend time without any medium?**
- 3803 11:47 No they always need to have some nutrients (0.3) if you put cells without nutrients they
- 3804 will die
- 3805 11:59 **for how much time?**
- 3806 12:03 it depends (0.3) it depends since I don't have uh::[

3807 12:08 [**so hours minutes seconds**

3808 12:11 since I don't have experJoannets of that I don't know

3809 12:19 **Some said you can leave them for a couple of hours that wouldn't really**

3810 12:23 Affect them? may be I didn't try it myself and I don't know about it

3811 12:31 **Is it not important to u:hm (.) to know if the ss the medium is u:h smothering the**

3812 **cells may be they need to get rid of it some time as an experiemnt is it important to**

3813 **know?**

3814 12:50 To get rid of the medium? no I don't think

3815 12:56 **I mean cancer cells in particualr not any cells**

3816 12:59 They are growing like we're putting them all the time in the medium and they are

3817 growing they've lots of eating so

3818 13:04 **so for you since they are growing that's fine?**

3819 13:07 Yes

3820 13:09 **As long as they're growing it means that they that they are healthy**

3821 13:14 Yes you can see when they are not healthy you can see a different of difference of the

3822 shape and everything

3823

3824 **16. If cancer is a molecule that is causing a disorder in the regulation of the cellular**

3825 **reproduction (.) would it be possible that the molecule stay in the medium (.) get**

3826 **multiplied there and then contaminate the others that may have been cured?**

3827

3828 **STEPHAN 16**

3829 35:58 **uhm so if cancer is a molecule (.) is it a molecule?**

3830 36:02 cancer? no it's not a single molecule

3831 36:05 **not a molecule ok (.) ok let me finish the question ((laughter)) I will see because I**
3832 **thought in a different way ok if cancer is a molecule that causing a problem in the**
3833 **regulation of the cell multiplication (.) wouldn't that molecule stay in the medium get**
3834 **multiplied there and then contaminate the others that may have been cured?**

3835 36:32 Yes (.) indeed (.) some compounds produce like cancer cell that maintains their
3836 cancerous state might and far probably excreted and if you would culture normal healthy cells
3837 alongside may be they will also become affected and induce the support of cancer grow for
3838 (.) or may be (.) different or how to say that uh transform it to cancer cells themselves also

3839 37:06 **so contamination is possible?**

3840 37:08 → ↑ So it's possible yeah but uh: but in at least in how research we're studying we're
3841 making cultures of (.) all our cells in the culture they're all cancerous cells (.) they're not
3842 contaminating each other ((laughter))

3843 37:24 **no I mean when you test a drug on cell lines**

3844 37:27 uhum

3845 37:28 **uh some of them are already cured the others that are not cured because they are**
3846 **in the same medium**

3847 37:36 they will the same yeah (.) so but that's then in that sense indeed you might not see the
3848 full effect but uh normally you're canalizing like the whole culture if you are like averaging
3849 the effect of the whole (.) so if you would have some drug that would be affecting the cancer
3850 may be it doesn't kill all the cells but you should be able to measure some kind of increase or
3851 decrease depending on what you're measuring (.) as an overage it affects all of its own culture
3852 and if you see a change in that way you know it's a functional the drug

3853 38:15 **ok but the idea of the medium itself does it play a role in this contamination?**

3854 38:19 oh yeah for sure (.) it's u:h there's compounds that are excreted and are: that are
3855 floating in the medium and it's also known that if you grow cancer cells or other cells you just

3856 only take the medium without the cells and transfer it to other healthy cells you might affect
3857 their function (.) that happens yeah that's a known hormones grow factors
3858 38:46 **so let's go back to the idea of changing constant changing and flow of the medium**
3859 38:50 uhum
3860 38:51 **how how would you account for the importance now the need to get a new system**
3861 **that close or the system that you described that flows the medium in a constant way that**
3862 **does not allow this contamination?**
3863 39:07 uhm (.)
3864 39:11 **or minimize the chance of contamination**
3865 39:13 well in this sense it's also: important like (.) because in the labs I think you want to
3866 study something that u:h may be in the body it will take a lo::ng time may in the labs you
3867 would prefer to have something that occurs very fast (.) so if you would be removing some of
3868 those factors that are being secreted by this flow systems (.) may be you would slow down
3869 the whole process (.) and may be then it would become more difficult to: to study it so maybe
3870 that would also hamper your study so in that sense in some cases it might be also beneficial
3871 not to use such a pump system
3872 40:00 **what about depriving the cells cell lines from the medium for some time using the**
3873 **drug without medium for like half an hour and see the effect?**
3874 40:12 u::h that might be a very good thing because then you keep them nicely concentrated
3875 and more susceptible that depending on the drug may be that would be a good thing or a
3876 better it depends on u:h
3877 40:26 **has this thing happened before?**
3878 40:27 I don't know oh yeah you can u:h do these things for example lots of bfff not not only
3879 with drugs but sometimes (.) we just take away the whole medium for example when we
3880 want to do virus infections (.) then we just have a very little amount just enough to cover the

3881 cells with a highly concentrated virus (.) solution: and then we just let them stand for like a
3882 short time before we replenish the medium with a bigger amount so they can make it for like
3883 () so yeah sometimes sure you use this deprival state a little bit (.) just to concentrate things
3884 and

3885

3886 **BRIAN 16**

3887 36:11 **ok now another question (.) if cancer if (.) cancer is a molecule that is causing**
3888 **problem in the regulation of the cell multiplication**

3889 36:24 yes

3890 36:24 = **wouldn't that molecule stay in the medium (.) get multiplied there and**
3891 **contaminate it (.) contaminate the others that may have been cured (.) so the condition**
3892 **of leaving the: the medium there wouldn't that be a contamination itself? if cancer is a**
3893 **molecule**

3894 36:51 it can be yes it can be a molecule and it can be a molecule that is secreted from the
3895 cells yeah could be yeah yeah

3896 37:06 **ok u:h**

3897 37:09 there are some examples of that so yeah

3898 37:11 **so if it it it can be a molecule**

3899 37:16 yes it can be

3900 37:14 **and this idea of the medium that has to change completely wouldn't that be u:h a**
3901 **way to contaminate (.) constantly contaminate the cells the one another?**

3902 37:29 no because you don't use the medium of one dish to to the other cells

3903 37:36 **no no the same (.) the same u:h**

3904 37:38 no but in the same dish you have only one type of cells

3905 37:42 **yeah some of them get get cured because you use drugs**

3906 37:47 ah ok we're talking in (.) if the cells are all the same if you kill one you will kill the
3907 other

3908 37:56 **now when you always talk about resistance (.) that cancer is resistant right?**

3909 38:01 yes

3910 38:00 **what is resistance? resistance (.) is it (.) if you test a drug here (.) may be there are**
3911 **starting to cover recover: but at the same time the other because they are contaminated**
3912 **they contaminate the others (.) because the medium is always there (.) so the molecule is**
3913 **always there**

3914 38:20 No but the: this is u:h to have a system to drug you need to incubate the cells with these
3915 drugs and not always u:h you have to use not always a very high concentration you have to
3916 incubate these cells for 2 months so you have to change the medium every two three days
3917 during two months with this drug and then in this () you will kill almost 90% of the cells and
3918 from this 10% they will probably stop growing (.) and then they will find a way to grow even
3919 with this drug (.) but thihs this takes a long time (.) it's not something that you can do just (.)
3920 like that

3921 39:06 **so resistance has nothing to do with the fact that the medium is there even though**
3922 **you agree that cancer can be molecule**

3923 39:15 yes

3924 39:16 **which is constantly in the medium (.) so but has nothing to do with the**

3925 39:20 no because you change the medium every two three days two three days (.) after two
3926 three days you will remove all this molecule (.) so the other cells will be free from this
3927 molecule

3928 39:34 **but part of them u:h (.) the molecule get inside the cells**

3929 39:39 Yeah it could be (.) it could be it could be but in the beginning I don't think it will be
3930 the:: (.) well it could be but the change to adapt cells to develop resistance to something ()
3931 you need like two months (.) so: it's not something that this immediately created
3932 40:02 **resistance?**
3933 40:01 uhm
3934 40:02 **uh la you need two months to u:h to be able to observe it but maybe it's starting**
3935 **inside?**
3936 40:09 ah of course it starts before yeah of course (.) even after 24 hours you can see changes
3937 40:21 **ok but what is now intriguing me u:h that you said cancer is a molecule or can be**
3938 **a molecule right?**
3939 40:29 yes
3940 40:29 **but Daniel for example said no cancer cannot be a molecule (.) he said it's just the**
3941 **condition**
3942 40:36 cancer is the disease that (.) the disease could be caused by u:h virus and a virus is a
3943 molecule
3944 40:43 **exactly (.) that's what I asked him (.) he said he said cancer is not a molecule (.)**
3945 **cancer is condition of the fact u:h cells get multiplied in an abnormal way (.) I told him**
3946 **but what is causing this abnormal multiplication**
3947 41:02 yeah
3948 41:02 **he said it's a condition it's not a molecule it's not physical something (.) but you**
3949 **say may be a virus?**
3950 41:08 may be a virus or may be some proteins that are secreted or may be some RNAs so
3951 molecules
3952 41:15 **uhm**
3953 41:17 yeah could be (.) there are a lot of cases described

3954 **DANIEL 16**

3955 33:46 ok bon c'est une question maintenant qui a un rapport un peu on va voir un peu le
3956 rapport avec ça mais la question maintenant c'est (0.4) voilà oui (0.5) if cancer is a
3957 molecule (.) c'est une molécule that is causing a problem in the regulation of the cell
3958 multiplication (.) donc c'est une molécule qui fait qui cause certains problèmes dans la
3959 régulation de la multiplication des cellules (.) wouldn't that molecule stay in the medium
3960 get multiplied there and then contaminate the other cells that may have been cured (.)
3961 d'abord est ce que d'abord est ce que le cancer est une molécule ou pas si c'était une
3962 molécule le fait que le cancer soit dans le milieu abondamment est ce que ça fait une
3963 contamination et du coup si on imagine les cellules qui s'essayent de guérir mas mais la
3964 contamination est abondamment là

3965 35:02 alors le fait de voir le cancer comme une molécule (.) ça je pense pas fin:: (.) c'est
3966 quelque chose de beaucoup plus complexe que: juste une cellule et on voit une molécule qui
3967 arrive et qui: qui affecte: la multiplication (.) c'est plus un ensemble de:: de modifications au
3968 niveau de la cellule qui qui fait qu'il va y avoir un cancer qui va être qui va se métastaser (.)
3969 après u:h en supposant un peu cette uhm cette image que le cancer reste uh ça on le retrouve
3970 un peu dans: quand on traite par exemple une tumeur on voit qu'il y a une régression on va
3971 dire de 90% (.) par contre on a toujours uh on peu appeler un noyau dure de cellules (.) qui
3972 elles il va peut être en rester je sais pas même 1% de la masse tumorale initiale qui elles ont
3973 déjà résisté au traitement et vont être capable de reformer un cancer (.) et c'est ce pour cent là
3974 est plus important en fait

3975 **36:09 c'est du à quoi cette résistance**

3976 36:11 c'est du au fait que c'est des cellules qui ont (.) avec qui peut être des modifications
3977 génétiques plus importantes par rapports aux autres cellules qui:: on sait pas trop ça tu vois un
3978 peu l'hypothèse des cellules souches mais u:h oui c'est des cellules qui à un moment donné uh

3979 dans le développement de la tumeur ont acquis des: un plus de capacité à s'adapter et c'est
3980 elles qui sont à l'origine de:

3981 36:47 **mais c'est pas encore claire**

3982 36:48 non

3983 36:47 **c'est pas encore claire uh comment elles s'adaptent au elles résistent**

3984 36:52 non

3985 36:53 **c'est pas encore claire**

3986 36:52 non il y a même (.) l'hypothèse de la cellule souche est encore assez uh controversée il
3987 y en a qui disent non c'est juste que: ceux disent oui effectivement dès le départ il y a un
3988 pourcentage de cellules qui:: sont dites souches donc uh produisent le cancer et d'autres qui
3989 disent que c'est pas au départ mais c'est

3990 ((interruption by another person))

3991 37:42 **alors donc (.) et donc il peut pas y avoir cette possibilité que dans le medium il y a**
3992 **quelque chose qui reste abondamment et qui et qui fait que**

3993 37:50 uh::

3994 37:50 **il joue un rôle dans la résistance**

3995 37:52 ben s'il doit rester quelque chose ça serait sous population de cellules ça sera pas une
3996 molécule

3997 37:59 **ouais**

3998 37:59 mais une sous population de cellules ça: uh on peut le voir il peut y avoir par exemple
3999 une flasque avec uh des cellules on va les traiter et ce qu'on avoir apparaître 'est des petits
4000 silos de cellules (.) les tout petits qui auraient disséminés sur dans la flasque qui eux sont
4001 auront résisté et puis t'es sûr à voir que ces silos vont grandir (.) et c'est eux qui sont à
4002 l'origine de:: ben d'une tumeur qui va repartir: () (.) mais c'est pas (.) c'est pas une molécule

4003 qui fin (.) je vois bien là ce que tu veux dire mais u:h c'est pas une molécule qui reste dans le
4004 milieu quoi c'est
4005 38:46 **c'est pas une molécule?**
4006 38:47 non
4007 38:49 et **et le cancer on sait pas toujours si c'est une molécule ou qu'est qui**
4008 38:53 non le cancer c'est u:h un ensemble de changements qui se fait dans une cellule et qui
4009 fait que ça peut être u:h génétique ou environnementaux en fin
4010 39:07 **mais à la base qu'est ce qui cause cette () fin**
4011 39:11 c'est un (.) même chose c'est un une dérégulation dans le: ce qui normalement contrôle
4012 la division de cellules (.) on a plus de: système de frein on va dire
4013 39:26 **uhm**
4014 39:27 et que la prolifération est accélérée dans (.) dans ces cellules c'est ça en général uh
4015 c'est plus des modifications génétiques au niveau de l'ADN quoi
4016 39:39 **donc le donc en un mot si fin le fait que le milieu ne change pas n'a rien à voir**
4017 **avec la: résistance des cellules**
4018 39:47 non
4019 39:48 **rien à voir?**
4020 39:49 non
4021 39:52 **ok**
4022
4023 **DILARA 16**
4024 21:58 ((click of the tongue)) d'accord (.) now next question if cancer is a melecule (.) si
4025 **on suppose que le concer est en fin de compte une molécule (.) that is causing in the**
4026 **regulation of cell multiplication donc on voilà wouldn't that molecule stay in the**
4027 **medium get multiplied there and then contaminate the other cells that may have been**

4028 **cured? donc si on parle maintenant du milieu le que le mileu est constament si le cancer**
4029 **est une molécule (.) il peut être une molécule non?**

4030 22:42 Dans le ses ou par exemple il y a certains virus qui causent des cancers

4031 22:46 **oui**

4032 22:48 Comme certains virus causent des cancers ces virus là peuvent se retrouver dans le
4033 milieu et aller infecter d'autres cellules

4034 22:53 **uhm**

4035 22:54 C'est ça l'idée?

4036 22:55 **non attend le cancer on sait ce que c'est la le problème de prolifération c'est ça?**

4037 22:59 **oui**

4038 23:00 **Par contre (.) qu'est ce qui cause la prolifération ça peut être un virus?**

4039 23:04 **oui (.) ou une molécule**

4040 23:06 **ou une molécule c'est ça (.) on supposant que le cancer est une molécule**

4041 23:08 **oui**

4042 23:11 **Si cette molécule elle est dans les cellules cancéreuses**

4043 23:14 **oui oui**

4044 23:16 **si on met le milieu tout le temps là et quand on travaille sur des drugs des**
4045 **médicaments si les médicaments réussissent à guérir une partie de la lignée cellulaire**
4046 **mais le fait que milieu est tout le temps là le virus reste tout le ment tout le temps là ou**
4047 **la molécule en fin elle se quand on parle par exemple de uhm de la résistance des**
4048 **cellules qu'est ce qui cause cette résistance ? Est ce que ça peut pas être le fait que le**
4049 **milieu soit tout le temps là et donc les molécules sont constamment en train de se**
4050 **contaminer? est ce que ça a du sens?**

4051 24:00 **uhm je ne pense pas parce que le milieu n'est pas tout le temps là vu qu'il est renouvelé**
4052 **et tous les deux jours ou tous les trois jours en fonction (.) et on pour moi donc là du parles**

4053 bien du développement d'une nouvelle molécule pour soigner le cancer ? pour soigner le
4054 cancer?
4055 24:28 **oui d'un [**
4056 24:29 et donc d'un médicament
4057 24:30 **oui c'est ça [**
4058 24:30 mais donc si comme je te disais pour moi en fin pas pour moi mais c'est comme ça que
4059 ça se fait (.) en fait tu utilises des cellules pour identifier l'impact de ton médicament sur la
4060 cellule mais pas le fait qu'elle meurt ou qu'elle ne meurt pas c'est vraJoannet au niveau des
4061 protéines au niveau de [
4062 24:50 **ah mais par exemple la recherche que fait euh Daniel**
4063 24:54 oui
4064 24:54 **c'est ça c'est du médicament il est en train de tester des médicaments sur les**
4065 **lignées cellulaires**
4066 24:59 oui
4067 24:59 **et il mais carrément des médicaments pour voir l'aspect thérapeutique qu'est ce**
4068 **que ça non?**
4069 25:06 oui il regarde au niveau des différentes réactions qui se font
4070 25:10 **ah**
4071 25:13 il s'arrête pas uniquement à voir est ce que la cellule meurt ou meurt ou est ce que la
4072 cellule ne meurt pas ça c'est un peu trop restrictif
4073 25:16 [**non non**
4074 25:18 **mais c'est quand même un des buts des objectifs s'il va constater que fin ces**
4075 **médicaments là n'arrive pas à comment dirai-je tuer les cellules euh il s'inquiète pas il**
4076 **se dit pas p qu'est ce qui cause cette résistance? (0.2) il veut pas comprendre pourquoi**
4077 **elle résiste? ce qu'on appelle toujours les cellules cancéreuses sont constamment**

4078 **résistantes ou euh c'est comme ça le cancer puisque fin mais est ce qu'on sait ce qui**
4079 **est derrière la résistance?**

4080 25:53 parce que (.) j'ai l'impression pour moi ce qu'on appelle résistance c'est un peu un abus
4081 de langage (.) on fait tu vois c'est un peu comme les bactéries qui sont euh résistantes aux
4082 antibiotiques mais c'est parce que elles ont réussi à développer un mécanisme de défense
4083 contre les antibiotiques (.) donc les antibiotiques ne savent plus rentrer dans les bactéries ou::
4084 fin par différent moyens (.) et donc pour moi c'est un peu un abus de langage c'est juste que
4085 ici (.) si Daniel teste des molécules et que les cellules meurent c'est pas parce que dans ce cas
4086 si la cellule a dé:ployé un nouvel armement contre le médicament c'est plutôt par ce que le
4087 médicament ne va pas attaquer la bonne cible (.2) tu vois c'est un peu comme si () la cellule
4088 cancéreuse (.) et Daniel avec son médicament il vient de taper sur le petit doigt (.2) ben oui
4089 mais bon c'est pas () maintenant si le médicament Daniel il va taper dans les deux genoux
4090 ben là tu tombes (.) et donc pour moi c'est un peu ça l'objectif (.) donc la cellule est résistante
4091 mais elle est pas vraJoannet elle est résistante parce qu'on n'utilise pas les bonnes armes (.)
4092 parce que ce ne sont pas les bonne voix métaboliques qui sont visées

4093 27:14 **mais euh**

4094 27:14 = c'est ça le but en fait c'est d'étudier les voix c'est d'étudier les faiblesses des cellules

4095 27:20 **mais comment tu expliques que c'est pas (.) elle n'est pas seulement résistante**
4096 **mais elle se multiple d'une manière plus plus que résistance si si elle devient même plus**
4097 **comment dirai je comme si on était on train de la provoquer avec ce médicament**

4098 27:35 oui ça c'est du une adaptation (.) là elles sont adaptées

4099 27:40 **Cette adaptation là c'est elle est encore inex inexplicable?**

4100 27:44 je pense pas non

4101 27:46 **uhm**

4102 27:47 moi je la connais pas et je crois qu'on sait de plus en plus et (0;2) le problème c'est
4103 qu'on voilà c'est (.) LES CANCERS c'est euh énormément de maladies différentes et donc
4104 peut être les multiplication euh des cellules du cancer de la prostate on comprend très bien le
4105 processus mais le cancer du sein on comprend pas le processus (.) parce que les cellules sont
4106 différentes (.) tu vois toutes les cellules sont différentes et toutes les cellules réagissent
4107 différemment et se comportent différemment

4108 28:18 **D'accord donc pour pour conclure cette question alors le milieu ne peut pas avoir**
4109 **en aucun cas ne peut un rôle dans cette résistance ou le fait que fin euh dans le**
4110 **cette résistance ou cette adaptation ? il peut pas être derrière le fait que fin**

4111 28:37 Si je dirai pas en aucun cas parce que dans certain milieux tu peux avoir certains
4112 composés qui vont euh qui vont favoriser la résistance si par exemple les cellules cancéreuses
4113 ont un métabolisme qui est très rapide (.) donc les cellules respirent beaucoup plus qu'une
4114 cellule normale elles consomment beaucoup plus de glucose qu'une cellule normale fin elles
4115 sont plus euh elles ont un métabolisme plus rapide et donc du coup ben si tu mets beaucoup
4116 de glucose par exemple dans le milieu mais ça va favoriser le maintien en vie des cellules
4117 maintenant si t'en mets un petit peu moins peut être que les cellules vont se ressentir moins
4118 bien et si dans le milieu là tu viens ajouter ton médicament peut être que ce sera plus facile
4119 au médicament pour tuer les cellules (.) → tu vois peut être que le milieu peut avoir un
4120 impact sur la résistance mais maintenant il faut voir aussi si c'est important de modifier le
4121 milieu puisque l'objectif c'est quand même de se rapprocher de ce qui se trouve chez
4122 l'Homme (.) donc on peut pas modifier le milieu (.) de trop (.) il faut que ça reste quelque
4123 chose de reproductible

4124 29:53 **Donc tu dirais ou bien trouver quelque chose un autre système qui est réellement**
4125 **qui fait la qui imite réellement ou bien rester comme ça fin si on trouve un système qui**
4126 **fait exactement comme ce qui se passe dans le corps humain c'est mieux sinon**

4127 30:12 non je pense que c'est bien parce que le in vitro c'est un maillon de la chaîne (.) parce
4128 qu'il faut d'abord commencer en in vitro pour étudier vraJoannet à l'intérieur de la cellule ce
4129 qui se passe (.) puis après tu passes chez l'animal (.) et puis tu passes chez l'Homme (.) donc
4130 je pense que c'est un important mais maintenant tu ne dois pas non plus extrapoler les
4131 résultats que t'as eu sur 3 cellules euh dans une boite en plastiques à ce qui se passer chez
4132 l'Homme (.) mais c'est important pour comprendre le mécanisme d'actions (.) c'est pour ça il
4133 y a plein de guidelines euh sur euh sur différentes étapes tu vois le développement d'un
4134 médicament (.) et c'est vraJoannet euh pour comprendre le mécanisme d'actions

4135

4136 **GAELLE 16**

4137 18:07 **ok so (.) if cancer is a molecule or a virus that is causing a problem in the cell**
4138 **multiplication wouldn't that molecule or virus stay in the medium get multiplied there**
4139 **and then contaminated the other that may have been cured? so if you're working on**
4140 **your cells the medium is there the medium gets in the cells in an out because it's**
4141 **constantly swimming suppose that there is a molecule there or a virus that you don't see**
4142 **that you don't know and because the cells are constantly in the medium there is a**
4143 **contamination there so if you're trying a therapy a drug it doesn't work because there is**
4144 **contamination is this possible?**

4145 19:16 that the drugs then:: it depends what you are targeting because if you are targeting
4146 something u::h something after the:: (0.2) if we are targeting uh the:: I don't know the
4147 metabolism and the cause in the beginning it's not due to a break I don't know in a::: a
4148 mutation in metabolism pass way

4149 19:45 **uhm**

4150 19:46 if the cause is already there but you treat you know what I mean treat after it could
4151 work

4152 19:54 I'm talking about (.) may be you're not doing this research but people who are (.)
4153 are you trying therapies? you're trying on your cells?
4154 20:03 we I tried some drugs yes
4155 20:07 ok suppose the drugs that you're trying don't work they happen to be not effective
4156 because there is contamination and the contamination is constant because the medium
4157 is constantly there and some cells get cured but the others contaminate them again
4158 20:29 it could yes
4159 20:32 this is possible?
4160 20:33 yes (.) it's called resistance
4161 20:37 ok this is exactly what I wanted to get to (.) I want to get to the point of resistance
4162 (.) so what we call resistance what is it exactly? why cells resist? is it because
4163 20:49 because they adapt and they develop mechanism they develop ex:: escap there are
4164 sometime for example some u::h cells develop like u::h ejecting pump
4165 21:07 uhm
4166 21:08 they can put the drug outside of the cells and so the drug is not effective anymore
4167 21:16 so again can you explain to me why there is a risk of contamination in the medium
4168 21:25 I will not say it's through the medium it can be if how to say it could be the medium for
4169 example if we block the metabolism in u::h for example glucose the cells cannot take glucose
4170 anymore because we give them an inhibitor but may be they can take some signals from the
4171 medium to compensate
4172 21:55 uhm but for the case suppose there is a virus or a molecule in the medium
4173 22:03 yeah
4174 22:05 even if you change the medium after a week or so there is still some of it in the
4175 cells inside the cells because the cells consume right?
4176 22:12 uhm

4177 22:12 **so if there is a molecule there if there is a virus**

4178 22:18 yeah

4179 22:17 **would it contaminate the others cells and that causes**

4180 22:21 resistance?

4181 22:21 = **resistance**

4182 22:24 why not it could (0.2)

4183 22:32 **now**

4184 22:33 but we change the medium also so

4185 22:35 **after a week after resistance u::h is already**

4186 22:41 yeah

4187 22:43 **working right?**

4188 22:43 uhm

4189 22:46 **and they become even stronger the cells right? is this true?**

4190 22:49 yeah

4191

4192 **CÉDRIC 16**

4193 27:50 **now to go back to what is cancer you said cancer is a problem of proliferation and**

4194 **so basically it's multiplication so the cells keep multiplying in an abnormal way (.) but**

4195 **what causes that is it initially a molecule?**

4196 28:10 yeah

4197 28:11 **it can be?**

4198 28:11 it can be different stuff it can be u:h molecular so like you have glycogen that are u:h

4199 u:h ((breathing out loud)) increasing the risk of mutation on the genome that causes cancer

4200 28:30 **so supposing that it's a molecule suppose that it can be a molecule (.) if if cancer is**

4201 **a molecule that's causing a problem in the regulation of the cell multiplication wouldn't**

4202 **that molecule stay in the medium get multipli multiplied there (.) and contaminate**
4203 **other u::h cells that are cured already so this issue of u:h resistance now we get back to**
4204 **resistance why cells resist?**

4205 **((the lab director walked in and said in French: " quoi? tu attaques le nouvel**
4206 **recru?" Interviewer: oh yeah (.) pour voir le (.) la différence ((laughter)) " () bien je**
4207 **t'influence"))**

4208 29:14 can you can you repeat the

4209 29:14 **in terms of resistance when we talk about resistance (.) so if they stay in the same**
4210 **medium and supposing that there is a molecule there after some time you say these cells**
4211 **resist but you don't know why they resist you say ok cancer is very resistant is it**
4212 **possible that because there is a molecule that constantly there swimming in the medium**
4213 **that gets (.) partly some cells are (.) cured but others are not but again they are**
4214 **contaminated by the other and that's what causes resistance**

4215 29:58 yeah often often the:: the (.) molecule that you're speaking about are environmental
4216 molecule

4217 30:06 30:06 **say it again**

4218 30:07 envir environmental

4219 30:09 **environmental?**

4220 30:10 yeah molecule

4221 30:11 **u:huh**

4222 30:11 so it's not it's not something that you would find again in the medium (.) like you take
4223 (.) the molecule A that is u:h going out of the car (.) they are making the cell u::h a cancerous
4224 you won't find it again in the medium after (.) it just disappeared make the cell cancerous
4225 then you took the cell put in the lab and now it's cancerous because of the (.) molecule again
4226 (.) you know what I mean?

4227 30:50 **not exactly I mean just to**

4228 30:52 it acquire a cancerous phenotype or and genotype and now it has it just keep it in the

4229 lab

4230 31:01 **no but the idea is that if cancer is a molecule and it's in the medium there is no**

4231 **risk of contamination and that's why there is resistance? the fact that the medium is not**

4232 **flowing constantly so it's there for week and**

4233 31:16 no

4234 31:19 **no?**

4235 31:19 I don't see that so (0.3) yeah I don't see it like that

4236 31:22 **you don't think so?**

4237 31:33 not sure it could happen

4238 31:35 **may be I need to explain it again**

4239 31:38 I'd I don't know because you're speaking about molecule that making the cell cancerous

4240 but what I was telling you is that often this molecule it's not here anymore it's not in the

4241 medium with the cell

4242 31:51 **why**

4243 31:52 because the cell is already cancerous ok it acquire mutation of it's genome

4244 31:57 **yeah yeah**

4245 31:58 and know it's it's cancerous (.) and after if you cure it cure cure a cancer cell mean is

4246 basically to kill it you don't have other way to do

4247 32:13 **so you mean that**

4248 32:16 you can't (.) I'm (.) I'm confident you can't u:h get a cancer cell back to () you basically

4249 have to kill to get rid of it

4250 32:33 **u:h**

4251 32:34 that's the point of what we're doing in the human

4252 32:34 **yeah but some are killed but others are not and they all swim in the medium and**
4253 **the ones that are not killed already have the molecule beacuse it's there (.) and some**
4254 **contaminate the others it's not possible? this resistance is not a matter of**
4255 **contamination?**

4256 32:56 no

4257 32:58 **no?**

4258 32:57 no there the resistance of u:h the cell it's yeah it's not cell always contama
4259 contaminated

4260 33:08 **it's not for sure?**

4261 33:12 I don't know

4262 33:11 **but because usually we say ok these cells are resistant very resistant they even**
4263 **become more aggressive after drugs but why?**

4264 33:24 it's because you (.) selected the one like let's say you have 2 type of cell in your cancer
4265 pool you have type A type B (.) type A is just one mutation making the cell cancerous type B
4266 has 2 mutations (.) the same was as A and an extra one then your drug kill all the cell A and
4267 keep all the B may it's just one cell but you don't kill it and then it start to grow again and
4268 then you only have type B cell in your population this population this type B is resistant and
4269 may be during this process an extra type C with an extra mutation appear you try another
4270 drug keep type B cell but you still have type C and so with time you get more and more
4271 resistance

4272 34:15 **ok so from that I understand that it's not really an issue there is no possibility of**
4273 **this contamination resistance has nothing to do with**

4274 34:27 it's not a class contamination between the cells

4275 **PAUL 16**

4276 8:53 ok (.) now if cancer turns out to be a molecule that is causing the abnormal
4277 proliferation so all you know about cancer is not (.) abnormal proliferation but it can be
4278 a molecule right? There is a possibility or no?

4279 9:09 that molecule?

4280 9:08 that molecule is causing the proliferation of cell (.) like today for example I read an
4281 article it says that there is u::h a scientist that found a molecule that is causing this
4282 proliferation (.) is it possible?

4283 9:26 you mean a molecule causing cancer?

4284 9:29 causing cancer yeah

4285 9:29 yes they are mutagenic comp there are mutagenic compound which will will promote
4286 the proliferation of cancer cells

4287 9:39 ok (.) if cancer is a molecule or turns out to be molecule wouldn't that molecule stay
4288 in the medium (.) grow there and then contaminate cells that may have been cured? this
4289 issue of contamination or of resistance in particular (.) can it be related to the medium
4290 and to the way these permanently exposed to (.) to cells at least in the way we do it now

4291 10:08 well I think that there (.) there is some u::h you need to enter a bit into the biology of
4292 cancer again (.) the genetic alterations occurring in cancer are due to mutations to
4293 chromosomic u:h rearra rearrangemnts (.) it's because you expose cells to some agents which
4294 will make the replication of the DNA not really as expected (.) so in u:h in the smoke for
4295 people smoking the you have it in the smoke you have compounds which will modify the
4296 DNA of the cancer cell and the cancer cells will start to proliferate by itself not because of the
4297 of the of the compounds in the smoke but this compound has altered the DNA of the of the
4298 cancer cells in order to stimulate the the u:hm in order to have a cell with a different
4299 phenotype u:h producing itself a lot of grow factor or not being controlled (.) so normally

4300 healthy cells which to which divide divide in 2 after being divided in 2 it will stop (.) n cancer
4301 cells after this division there is no control and the 2 daughter cells will form 4 daughter cells
4302 and and et cetera (.) so it's more the uncontrol of the growth which is the characteristic of
4303 cancer but the compounds inducing cancer they are not stimulating the cancer proliferation
4304 per se they they they do alter the genome of of of the cells which in turn will proliferate (.) so
4305 I will say that when the cells is transformed the word is using cell biology to do that it is
4306 genetically altered u:h the cell is the cancer cell is growing (.) as long as you do not kill all
4307 the cancer cells with with a compound u:h the cancer will always regrow so if you have one
4308 cell left even if you kill one million of them (.) the last one will progressively regrow so you
4309 need to be always u:h with a 100% u:h elimination of the cancer cells (.) so this being said I I
4310 do not see the compounds (.) if I take a smo a smoker who would have a cancer developed in
4311 his lung and treated and hopefully being cured (.) if the guy keeps smoking (.) you will again
4312 re-expose cells from his lung to to this kind of inducer agent ad there is a risk to to to become
4313 again exposed to to to develop cancer (.) if you mimic that in vitro (.) you can add on healthy
4314 cells that you culture in vitro you can add some mutagenic compound (.) you will induce
4315 mutations which will transform the healthy cells into cancer cells (.) and then you do not need
4316 to mutagenic compounds to be present anymore (.) the cells have been altered in such a way
4317 that they keep going they keep proliferating so (.) I I cannot see a situation where your
4318 question is u:h is making sense in this context of a compound which would u:h be there and
4319 as long as it is in the medium it would keep the the cell proliferating

4320

4321 **DALILA 16**

4322 10:56 **D'accord (.) Now if cancer is a molecule on suppose que le cancer c'est une**
4323 **molécule qui derrière ce problème de prolifération de cellules**

4324 11:08 oui

- 4325 11:09 **wouldn't that molecule stay in the medium (.) get multiplied there and**
- 4326 **contaminate the others that may have been cure? Donc si image un peu le problème de**
- 4327 **la résistance des cellules (.) on teste des médicaments**
- 4328 11:29 oui
- 4329 11:30 **on se dit ça allait marchait ici après il y a une régression non ça marche pas elles**
- 4330 **deviennent en fait plus euh résistantes qu'avant le médicament (.) on ne comprends pas**
- 4331 **toujours pas le problème de**
- 4332 11:43 plus agressives?
- 4333 11:43 **oui plus agressives**
- 4334 11:45 on va avoir des cellules plus agressives?
- 4335 11:46 **oui ce problème de résistance (.) ce problème de résistance c'est quoi en fait?**
- 4336 **Qu'est ce qui fait on dit ben oui parce que ces cellules ont [**
- 4337 11:56 [ben peut être elles ont changé de métabolisme ou qu'elles ont modifié quelque chose
- 4338 ce qui fait que après:: elles deviennent résistantes
- 4339 12:02 **Oui mais exactement cette résistance où vient d'où vient cette force? qu'est ce qui**
- 4340 **fait que la résistance u:**
- 4341 12:10 on sait pas puisqu'on sait pas ce qui cause le cancer ((laughter))
- 4342 12:11 **d'accord donc si on imagine que le cancer peut être une molécule**
- 4343 12:18 oui
- 4344 12:18 **la possibilité elle est là u:h? en tout cas**
- 4345 12:22 oui
- 4346 12:23 **si le milieu garde toujours cette molécule puisque la molécule est infinJoannet**
- 4347 **petite**
- 4348 12:28 oui
- 4349 12:28 **et que le fait qu'il ait toujours le milieu**

- 4350 12:37 ()
- 4351 12:37 **oui? donc ça contamine (.) la contamination elle toujours là (.)**
- 4352 12:42 Je comprends pas
- 4353 12:43 **Le fait qu'il est là**
- 4354 12:44 Parce que le cancer c'est une cellule qui prolifère
- 4355 12:46 **oui mais la cause mais la cause de la prolifération ça peut être une molécule ?**
- 4356 12:52 oui si'il y a une modification de la cellule
- 4357 12:55 **mais cette modification de la cellule**
- 4358 12:58 oui mais nous c'est pas grave on veut quand même des cellules cancéreuses (.) donc
- 4359 quel est le problème?
- 4360 13:04 **non quand vous testez du médicament vous voulez que ça marche (.) vous injectez**
- 4361 **du médicament**
- 4362 13:10 dans la souris?
- 4363 13:11 **dans les cellules**
- 4364 13:12 Dans les cellules
- 4365 13:14 **Dans les cellules pour voir si ça guérit ou pas non?**
- 4366 13:16 oui
- 4367 13:16 **Alors vous injectez le médicament**
- 4368 13:18 oui
- 4369 13:19 **ça ne réussit pas**
- 4370 13:22 oui
- 4371 13:24 **sil dans le milieu il y a une molécule qui sort de ces cellules cancéreuses**
- 4372 13:28 oui
- 4373 13:30 **Et qui est derrière cette maladie**
- 4374 13:32 oui

- 4375 13:34 = **de la prolifération (.)** puisqu'elle est toujours dans la le le milieu
- 4376 13:36 on dit que le médicament ne fonctionne pas alors
- 4377 13:41 **Donc il ne fonctionne pas mais il ya aussi la contamination**
- 4378 13:45 la con
- 4379 13:47 **auto-contamination puis que le:::**
- 4380 13:55 Le but des médicaments c'est de tuer cette petite molécule qui provoque le cancer et
- 4381 donc si ces petites molécules sont tuées elles ne peuvent pas auto-contaminer ↑ elles ne
- 4382 peuvent pas contaminer ↑
- 4383 14:05 **Le médicament est là pour tuer la molécule dans tout le milieu donc?**
- 4384 14:12 Mais pour moi le cancer c'est pas une molécule ((laughter)) c'est pour ça
- 4385 14:15 **C'est pas une molécule? Ben j'ai lu partout que ça peut être une molécule (.) on ne**
- 4386 **sait pas pourquoi (.) hier par exemple**
- 4387 14:21 oui mais la molécule elle agit sur les cellules
- 4388 14:24 **Elle agit sur les cellules (.) donc ce qu'on voit sur quand on dit prolifération etc.**
- 4389 14:26 oui
- 4390 14:27 **ça c'est le phénomène (.)**
- 4391 14:30 oui
- 4392 14:31 **ce qui fait surface**
- 4393 14:33 donc le l::: le cancer est une molécule qui agit sur les cellules tumorales dans notre
- 4394 flasque et fait proliférer nos cellules
- 4395 14:41 **oui**
- 4396 14:44 Par contre si on a un médicament qui empêche cette molécule d'aller sur notre cellule
- 4397 et de la pas proliférer la cellule elle va mourir (.) donc elle peut pas être auto-conta ils ne
- 4398 peuvent pas c'est juste que les cellules elles meurent
- 4399 14:58 **uhm je vois**

- 4400 15:00 Si les cellules meurent qu'il ait de la molécule ou pas dans le::: dans le milieu on s'en
4401 fou puisque les cellules elles sont mortes
- 4402 15:06 **ah puisque la thérapie consiste à tuer les cellules donc**
- 4403 15:10 oui
- 4404 15:11 **mais dans ce cas**
- 4405 15:14 puisque la molécule n'agit plus sur la cellule puisque la molécule n'est plus là
- 4406 15:18 **uhm donc tu parles précisément des thérapies qui tuent les cellules**
- 4407 15:24 oui
- 4408 15:24 **c'est ça la thérapie? c'est ça la**
- 4409 15:26 oui déjà c'est
- 4410 15:26 **on tue les cellules**
- 4411 15:28 nous quand on met un traitement ce qu'on regarde si les cellules elles vivent ou si elles
4412 meurent
- 4413 15:32 **c'est ça le traitement**
- 4414 15:34 oui
- 4415 15:34 **on sachant que: on peut tuer les cellules non cancéreuses aussi en même temps**
- 4416 15:39 ah oui après il faut que ce soit quelque chose spécifique qui a du tumoral (.) d'où après
4417 il faut tester sur deux cult u:h cultures cellulaires
- 4418 15:46 **donc on ce moment là si j'ai bien compris (.) on a pas encore développ jusqu'on**
4419 **sait pas qu'est ce qui derrière cette prolifération (.) on est même pas capable de trouver**
4420 **ou de chercher euh des médicaments qui attaquent les molécules on attaque les cellules**
4421 **on tue les cellules**
- 4422 16:05 oui
- 4423 16:08 parce que les cellules cancéreuses ont des caractéristiques spécifiques des cellules
4424 cancéreuses et ces caractéristiques là qu'on attaque

- 4425 16:16 **et on même temps on attaque les autres aussi**
- 4426 16:17 non puisque:: di idéalement le but c'est de trouver quelque chose qui attaque que les
- 4427 cellules cancéreuses parce que du si chais pas moi si on dit qu'une cellule cancéreuses elle est
- 4428 blonde que les cellules saines elles sont brunes (.) ben on va trouver quelque chose qui
- 4429 n'attaquent que les blondes
- 4430 16:34 **donc on n'attaque pas**
- 4431 16:36 j'espère que ()
- 4432 16:35 **donc non non j'ai compr comprends bien mais je veux dire que on se moment la**
- 4433 **thérapie consiste à tuer les cellules qui prolifèrent**
- 4434 16:45 oui
- 4435 16:44 **et non pas la cause derrière ça**
- 4436 16:49 parce que la cause elle peut être multiple (.) ça peut être génétique ça peut être
- 4437 environnementale ça peut être: plein de choses
- 4438 16:56 **mais quelque soit la cause ça peut être une molécule**
- 4439 17:01 ça pourrait oui
- 4440
- 4441 **JOANNE 16**
- 4442 13:22 **ok (.) now if cancer is a molecule that is causing a problem in the regulation of the**
- 4443 **cell multiplication (.) so people say (.) I will ask you first what is cancer for you?**
- 4444 13:41 as I said before cancer is like normal cell who accumulated lot of mutations and the
- 4445 DNA and those mutations affect the:: (.) proliferation and the cell death so
- 4446 13:57 **ok**
- 4447 13:57 so the cells are more
- 4448 14:00 = **problem of proliferation and mutation**
- 4449 14:03 uhum

- 4450 14:02 **so it's an irregular maybe fast spreading of multiplication right?**
- 4451 14:11 uncontrolled
- 4452 14:12 **uncontrolled**
- 4453 14:14 yes
- 4454 14:14 **but what is behind that?**
- 4455 14:17 behind what?
- 4456 14:18 **behind this disorder it's a disorder it's an uncontrolled it's a lot of multiplication**
- 4457 **abnormal mutation abnormal proliferation right? now what is behind it? could it be a**
- 4458 **molecule?**
- 4459 14:34 yea that causing the mutation?
- 4460 14:35 **uhum**
- 4461 14:36 it's different things like u::h X rays for example u:h you use some kind of u:h treatment
- 4462 ther are conserigène
- 4463 14:53 **but treatments are made of molecules**
- 4464 14:54 yes so it depends
- 4465 14:57 **it can be molecule?**
- 4466 14:59 Yes
- 4467 14:59 **bon ok (.) now if cancer is a molecule that is causing a problem in the regulation**
- 4468 **of the cell multiplication**
- 4469 15:06 yes
- 4470 15:06 **wouldn't that molecule stay in the medium get multiplied there and then**
- 4471 **contaminate the cells that have been cured so suppose you are working on a: on a drug**
- 4472 **you're testing a drug right in your cells right?**
- 4473 15:30 humum

4474 15:30 **suppose that the drugs happens or succeeds to treat some cells they are treated**
4475 **actually but because it's all swimming in the medium the molecule would stay there and**
4476 **it would contaminate again the other cells that have been cured already (.) is this**
4477 **possible?**

4478 15:54 I don't think so because (0.3) well it's very difficult if you'll u:h to contaminate to bring
4479 cancer it's not that easy so you need

4480 16:10 **it's not bringing from scratch they are already cancer cells**

4481 16:13 yes but they were treated

4482 16:16 **but the molecule is still there it's it's everywhere in the in the:: medium so the non**
4483 **treated ones would contaminated the treated ones because it's all in the same (.) medium**

4484 16:36 No I don't know I don't know but (.) for example if the treatments block a receptor for
4485 example (.) I don't figure out how another cell will take u:h that treatment of (.) you see what
4486 I mean

4487 17:01 **uhum**

4488 17:04 So I don't think so (.) I don't think they will u:h

4489 17:06 **there is no issue of contamination?**

4490 17:08 I don't know

4491 17:09 **wha is this this not related to: the fact that we say ok these cells resist (.) they**
4492 **resist drug they even become stronger (.) you say we tried drug on these cells but then**
4493 **they become even stronger they resist the drug**

4494 17:25 yes

4495 17:27 **why why why this resistance?**

4496 17:30 because u:h some times u:h you exposure those cells to u:h to more difficult like
4497 conditions (.) you see what I mean if you put this treatment you put the cells in more diffi in

4498 more difficult conditions and if they survive in this difficult condition they will be more
4499 aggressive

4500 18:05 **yeah this is an observation but what is behind that (.) so you just observed and**
4501 **noticed that because you them under stressful condition so they become more this just a**
4502 **conclusion c'est une constatation**

4503 18:22 See for example what the what I'm doing here is like micro environment and stuff like
4504 that so if you treat cells with anti angiogenic treatments this like stops the: the progression of
4505 vessels like because of cells need oxygen so they will u:h try to get vessels to them so if
4506 you'll stop this there will be cells that will be far away from the vessel

4507 19:01 **uhu:**

4508 19:01 and there is some mechanism inside the cells (.) when they will b not be in oxygen near
4509 (.) it will be activated and when it is activated it will cause u::h the characteristic of migration
4510 and metastasis (.) so they will become more aggressive (.) if they will be u::h like (0.3) if they
4511 will resist to this environment without oxygen and live in that environment they will activate
4512 such u::h a mechanism that they will make them more aggressive

4513 19:51 **uhm (.) so in your opinion medium has nothing to do with resistance and there is**
4514 **nothing to do related to this idea of contamination and medium ?**

4515 20:04 I don't know it really depends because (0.2) you can't say metastasis and u:h (0.2)
4516 aggressive cancer cells comes only from one factor it needs a lot of factors (.) one of them is
4517 u:h the like micro environment

4518 20:29 **because for me what you explained is just what you notice or what you conclude**
4519 **it's not what is behind this (.) that's to say you do this you conclude that it becomes**
4520 **more (.) stronger or it becomes aggressive (.) that's it's a conclusion that you make**
4521 **right? You leave it at this state you give it this condition you conclude that what**

4522 **happens is what the cells become but I want to understand what is behind it you don't**
4523 **know? you don't know what is behind this resistance?**

4524 21:04 I don't have any idea

4525 21:08 **ok**

4526 21:07 what (.) for me what you mean behind resistance it's activation of mechanisms

4527 21:13 **what activates the mechanism?**

4528 21:16 The fact that they are not u:h like in the normal condition

4529 21:21 **but biologically what is uh what is biologically what is activating it? we talk about**

4530 **viruses what talk about molecules we're talking about bacteria we're talking about u:h**

4531 **u:h whatever expression u:h gene expression or u::h**

4532 21:42 I don't know I'm like what for example what I'm explaining for the hypoxian stuff that

4533 21:48 **uhm uhum**

4534 21:48 there is one factor in presence of oxygen (.) it is degraded

4535 21:55 **uhm**

4536 21:56 but when there is no oxygen it's not degraded and it will activate things in the (.) in

4537 the cell and those (.) m: mechanism that will be activated (.) they are related to migration and

4538 metastasis (.) this is an example so (.) this is what I know (.) but may be there is u:h other

4539 things surely there is other things that affecting

4540 22:29 **uh w and the medium would not be one of them? The fact that the medium is**

4541 **constantly there contaminate other your of the cells? non?**

4542 22:38 No I don't know may be (.) you can't say for anything you don't really know

4543

4544

4545 **17. Do you think that the medium is too heavy for the cells?**

4546

4547 **STEPHAN 17**

4548 41:14 **do you think that the medium is too heavy for the cells? the weight?**

4549 41:19 Too heavy? u::h (.) uh that's a good one I never really thought about this ((laughter)) no

4550 I wouldn't (.) I don't think so (.) you also have cells in your body that are like in the bottom of

4551 your legs there is a lot of there is on top of them so I don't see why they would have to be u:h

4552 (.) suffer from that and it's also the:: how to call it the cells that cell also :: how to say that (.)

4553 they're filled with liquid (.) and on the outside it's also liquid and the liquid itself normally it's

4554 not compressible (.) so there is no such (.) I don't think there's a problem of pressure in that

4555 sense (.) may be there will be more problem in the sense of air pressure or

4556 42:22 **because when you mentioned you said the lower part of the body support or can**

4557 **bear the weight but the body the human has nerves the nerve that can u:h support this**

4558 **weight not only just naked cells (.) there is a difference between when you have a nerve**

4559 **muscles and just naked cells**

4560 42:43 no the: but I think that the pressure that is caused by the medium it's so little to

4561 negligible in that sense you need a lot of that before you really uh: start noticing an effect like

4562 that

4563

4564 **BRIAN 17**

4565 41:21 **ok (.) good now the next question don't you think that the medium is too heavy for**

4566 **the cells?**

4567 41:29 the medium?

4568 41:30 **the medium (.) not too heavy?**

4569 41:31 no (.) you have a very thin layer of medium no I don't think it's too heavy

4570 **DILARA 17**

4571 30:55 **très bien (.) do you think that the medium is too heavy for the cells? est ce que tu**
4572 **penses que en fin en termes de poids de poids est ce que c'est vraJoannet lourd pour les**
4573 **cellules ou ça ne peut pas être euh**

4574 31:12 euh c'est marrant comme question ((laughter)) c'est marrant ((laughter)) parce que les
4575 cellules sont pas euh n'ont pas de conscience fin c'est qu'une cellule tu vois il faut avoir un
4576 organisme d'au moins un tissue pour avoir une conscience donc les cellules ne sont pas
4577 consciente du poids une chose et d'autre part comme les cellules continuent à grandir comme
4578 ça horizontalement mais aussi verticalement (.) je pense que c'est pas trop lourd

4579 31:46 **uhum**

4580 31:46 Il y a certaine (.) il y a un poids puisqu'il y a une pression sur les cellules et ça les
4581 oblige à pousser c'est d'une façon horizontale ça c'est euh ça c'est oui mais je pense pas que ce
4582 soit trop lourd

4583

4584

4585 **GAELLE 17**

4586 22:51 **ok (.) now don't you think that the medium is too heavy for the cells?**

4587 22:58 uh?

4588 22:58 **heavy (.) the cells are**

4589 23:01 in the bottom of

4590 23:03 **the k yeah are in the bottom and you inject the medium like euff (.) is it heavy?**

4591 23:11 normally we are trying to put the medium carefully to not detach the cells (0.3) and for
4592 example in my case the cells are in suspension so () in the bottom of the flask they are in the
4593 medium in suspension

4594 23:32 **ah like swimming like this?**

4595 23:34 yeah

4596 23:40 **so there is no issue of like being if you compare for example look at the whole**
4597 **body human body that consumes drinks like this in terms of quantity or some food even**
4598 **in terms of volume you see there is a difference the human body is much bigger but if**
4599 **you see the cells you have almost non you cannot even see them by the naked eye right?**
4600 **bu the the quantity of the medium that you put on them is (.) could that be a problem**
4601 **no?**

4602 24:16 if the cells are growing (.)

4603 24:22 **ah**

4604 24:22 for me it's not an issue

4605 24:26 **so the way for you to see that they are growing they are healthy right?**

4606 24:29 yeah

4607

4608 **CÉDRIC 17**

4609 34:27 **ok now do you think that the medium is too heavy for the cells on the cells? it's**
4610 **not heavy?**

4611 34:35 the medium to the cell?

4612 34:35 **yeah**

4613 34:36 ah (.) I don't I'm never sure of that (.) u:h I don't see I don't see it put too much pressure
4614 on the cell no it's a thin layer of medium (0.2) so it's not possible that's it's putting too much
4615 pressure on the cell

4616

4617 **PAUL 17**

4618 14:10 **No? ok ((laughter)) u:h do you think that the medium is too heavy for the for the**
4619 **cells? in terms of weight**

- 4620 14:21 heay?
- 4621 14:22 **yes**
- 4622 14:23 amazing u:h (0.23) I've not (.) I've never thought of what happens u:h ((laughter)) I
- 4623 think that when we culture cells we do culture them in moloya monolayer so we have one
- 4624 layer of cell because this the way they grow u:h if there is space (.) beside them they will
- 4625 occupy this space so basically when cells grow they they do not move in 3 D they move in 2
- 4626 dJoannesions (.) u:h and the medium is supposedly giving some force on them (.) in a tumor
- 4627 they grow in 3 dJoannesion (.) so they are also compacted not because of the medium but
- 4628 because of of this large amount of cells in a small space (.) so I would say that even if the
- 4629 situation sis not the same that there is u:h also some sort of u:h mechanic pressure on the cells
- 4630 in vivo (.) so I would not care too much about the the the weight and I would address that by
- 4631 making the experJoannet of culturing cells with one centimeter versus 20 centimeters of
- 4632 medium to see whether there is a difference (.) I I I would do the experJoannet to respond to
- 4633 your questions but I cannot like that consider that it's it's a major factor
- 4634
- 4635 **DALILA 17**
- 4636 17:02 **ok (.) don't you think that the medium is too heavy to the cells? est ce que le**
- 4637 **milieu lourd pour les les ça peut être lourd? lourd**
- 4638 17:12 oui oui ((laughter))
- 4639 17:14 **((laughter))**
- 4640 17:15 je dis c'est l'impression que t'as
- 4641 17:16 **((laughter))**
- 4642 17:18 c'est ça la question?
- 4643 17:19 **oui**
- 4644 17:20 ah bon chai pas moi (.) non

- 4645 17:26 **non?**
- 4646 17:26 non
- 4647 17:27 **de toutes façons vous allez le teste (.) Paul a dit que je vais tester ça**
- 4648 17:31 tester quoi?
- 4649 17:32 **u:h**
- 4650 17:32 le poids du milieu sur les cellules?
- 4651 17:32 **oui**
- 4652 17:32 mais non il a dit ça?
- 4653 17:38 **il a dit je peux faire u:h**
- 4654 17:42 qu'on mette ou pas 50 ou 100 ml les cellules elles prolifèrent pareil donc uh:
- 4655 17:45 **non non non pas pas par rapport à la (.) c'est pas beaucoup pour les u:h la**
- 4656 **quantité**
- 4657 17:53 oui mais s'il y a plus de: si dans un même eu:h un même conditionnement on met plus
- 4658 de volume le poids est plus fort sur la tête des cellules
- 4659 18:03 **le le le milieu est beaucoup plus que**
- 4660 18:05 si
- 4661 18:07 **en terme de volume beaucoup plus grand u:h?**
- 4662 18:09 oui mais par contre bon on met parfois 100 ml sur u:h l:: sur les mêmes surfaces et si
- 4663 on met 100 ml sur la même surface le poids sur la tête des cellules est plus fort et elles
- 4664 prolifèrent pas moins bien (.) donc pour moi le: le milieu n'a pas de poids sur les cellules
- 4665
- 4666 **JOANNE 17**
- 4667 22:46 **ok don't you think that the medium is too heavy to the cells?**
- 4668 22:53 Too heavy?
- 4669 22:54 **yeah**

4670 22:54 what do you mean by that? a lot of concentration?

4671 22:56 **a lot of medium uh s put on the cells constantly there may be smothering them or**

4672 23:07 may be (.) I don't know because if you learn they will tell you you put such an amount

4673 of uh medium (.) to be in the right range

4674 23:17 **who would tell you?**

4675 23:17 u:h the people who teach me here

4676 23:23 **uh:**

4677 23:26 how to work

4678 23:29 **you mean how much the quantity of the medium? They tell you how much you**

4679 **should put?**

4680 23:32 yes

4681 23:34 **and who tells them?**

4682 23:34 uhm sometimes like: see when put for example cell culture on internet (.) you will get

4683 four different type of u:h flasks you know the things where we put cells you have to put u:h

4684 such an amount of medium (.) and such an amount of cells

4685 24:00 **who tells that in the net?**

4686 24:04 ↓ it's I think it's company they did u:h experJoannets and they know (.) what is the right

4687 range to put on the medium

4688 24:15 **so it's u:h basically not your u:h area of control it's others tell you and you do it?**

4689 24:23 yes

4690 24:23 **but this is a central thing that you do in research and it really it's out of your**

4691 **control? although this may have u:h negative consequences on::**

4692 24:35 negative? I don't think (.) if they are they were tested before so I don't think they were

4693 negative consequences

4694 24:44 **uhm if it was tested before so there is no problem (.) although if it's companies**
4695 **that are doing that and it's u:h u:h mmm an issue of money and profit and so you you**
4696 **completely trust other companies?**

4697 25:02 I don't completely trust other companies (.) but I trust what people tell me here
4698 ((laughter))

4699 25:12 **yeah but people here trust and consume or take for granted things that are**
4700 **already decided outside this lab (.)**

4701 25:21 Yes but see it's something coming from knowledge (.) like u:h you try this amount of
4702 medium you see it works and if you put even less you see it works so (.) you won't be obliged
4703 to put always the highest concentration the highest amount

4704 25:45 **Yeah I understand on the one hand I understand that you as a researcher doing**
4705 **research here you cannot u:hm check everything on your own and you know get**
4706 **manufacture everything on your own the is impossible at the level of the person**
4707 **and at the level of the lab the lab as well there are many things that re too complicated**
4708 **that you cannot control if you want to keep moving forward (.) but at the same time**
4709 **there are a couple of things that are really central and that you're building on and**
4710 **constantly building on in this research in the next one and the next one and the next one**
4711 **hundred u:h ((laughter))**

4712 26:32 ((laughter))

4713 26:33 = **research you're building on that**

4714 26:36 yes

4715 26:37 = **so for me this condition different from other details this is something central so**
4716 **whay people don't think about things that they build on? they constantly build on?**

4717 26:53 as I said they take it as u:h as something how to say ((laughter))

4718 27:02 **they take**

4719 27:01 for grant ((laughter)) ok (.) so they for example me (.) I think they did an experJoannet
4720 about this before and they know what is good things for the cells and what is the best
4721 condition for the cells (.) so you put this aside as something they did it you think ok I won't
4722 think about it I will focus in what I'm doing now (.) but if you (.) if you'll go think deeply on
4723 the basic things yes you'll have to ask yourself questions like why you put like this ad why it's
4724 not like that and as I said before it's just goo:d to u:h have u:h some labs who works on the
4725 basic sing things and be always in contact with other labs (.) to make them know about the
4726 situation

4727

4728 **18. Do you think that the cells that are immediately glued to the wall of the containers**
4729 **(flasks, wells etc.) may not receive the drug, which you want to test on them?**

4730

4731 **STEPHAN 18**

4732 43:04 **do you think that the cells that are immediately glued to the wall of the containers**

4733 43:09 uhum

4734 43:09 = **may not receive the drug that you test on the whole cell line? the ones that are**
4735 **glued immediately to the container**

4736 43:20 uh:m at least of the cells that we use (.) at least that I use (.) they are: formed in mono
4737 layers so all the cells are exposed to the medium and the drug

4738 43:32 **on one part not the other part**

4739 43:34 so one (.) one side of the cell is exposed and the other part might not exposed to it

4740 43:38 **one side is is enough?**

4741 43:41 u::hm y:es although it depends on also on the type of cells and on for example how the
4742 drug enters the cell if you need transporters like special big challenge to report a drug and
4743 when they are delivered and located and may be you need to modify your cell culture to

4744 allow to: those general proteins to be located in the top where they are in touch with the
4745 medium but it will depends on the drug and the type of cells (.) but could be u:h a matter of
4746 an important concern

4747 44:25 **it could be?**

4748 44:25 it could be of some concern

4749 44:27 **what? the fact that they are glued?**

4750 44:28 where where where the cells glue how they're located in the flask and if they're yes or
4751 not exposed to the drug or: can take it up from that

4752 44:42 **because uh often times it's not always clear whether the drug that you're testing is**
4753 **on the the on the cell line is ineffective or it's because it doesn't reach the cells and when**
4754 **it doesn't reach the cell it just because it's glued or other condition so how do you know**
4755 **when the drug is said to be not effective that's it's really ineffective or that it's not able**
4756 **to reach it's a problem of reaching the target**

4757 45:14 u::h yeah you'll have to find some way to measure the: to what degree drug the drug
4758 really penetrate the cell and (.) and I'm not specialist in that area but I think that's what you'd
4759 have to determine

4760 45:35 **but often times when you test drugs you say ok this is effective this is not effective**
4761 **(.) at the end you publish or don't publish you test the drug then you say ok we tested on**
4762 **this 3 tims it didn't work so that's fine we**

4763 45:49 No but you can like I guess for example like if you have your cells but you can do it
4764 that's like add a drug or not add a drug and in one cell that you'd added a drug you can wash
4765 the cells quickly and then pick up other cells and measure what is in the content of the inside
4766 of the cells if you measure the drugs there in there compare to your control sample then you
4767 know ok the drug is entering the cell and there are methods for calculating them

4768 46:20 **and do you do that automatically?**

4769 46:21 I don't know exactly how they do drug I'm not being into drug this stuff I'm myself so
4770 cannot be

4771 46:27 **no but I'm talking about the type of research that you're doing here (.) do you test**
4772 **that or you don't?**

4773 46:34 u:h me myself I don't test any drug efficiency so

4774 46:40 **so for example the other day I watched Daniel testing drug on the cell line**

4775 46:42 Yeah I'm not there testing

4776 46:44 **I guess or I understood that he just wanted to see the effect**

4777 46:48 yeah

4778 46:48 **but then if he sees that there is no effect (.) does he try to know whether it's not**
4779 **effective because it doesn't reach the target or it's just the molecule that**

4780 47:00 I don't know (.) whether he really test to evaluate the targeting of all such parameters
4781 normally it's something you'd have to evaluate do you know for sure that the drug is entering
4782 the cells or not otherwise you might have to change your mode of delivery in order to have ()
4783 to transport

4784

4785 **BRIAN 18**

4786 41:47 **ok do you think that the cells that are immediately glued (.) ok I already asked**
4787 **this question but please ((laughter)) bare with me because I have a certain order (.) Do**
4788 **you think that the cells that are immediately (.) No I did not actually ask this question (.)**
4789 **Do you think that the cells that immediately glued to the wall of the containers my not**
4790 **receive the drug that you test on the whole cell line? If they stay cancerous wouldn't**
4791 **they contaminate the others that might have been cured (.) ((He did not understand))**
4792 **this is the plate (.) a plate (.) the cells that are completely glued to the wall here**

4793 42:36 yes

4794 42:36 **if they don't get the:: the drug that you test and then they themselves contaminate**
4795 **the others that are**

4796 42:45 why why they don't take the drug?

4797 42:48 **u:h because they are glued to the container**

4798 42:54 yes but they (.) imagine this is the cell(.) they are glued in this side so that on top you
4799 don't have anything

4800 43:03 **on top what about the other side?**

4801 43:06 the other side is glued to the: but you'll have always the top available for the drug (.)
4802 because there is there are not not cells on top of these you only will have one cell (.) it's mono
4803 layered

4804 43:22 **ok mono layer**

4805 43:23 you don't have different layers

4806 43:26 **so the top part is enough?**

4807 43:28 yes (0.2) if the half of all the cells (.) on the half they are attached on the bottom and
4808 the top is free

4809 43:39 **ok**

4810 43:40 you can have also cells from the blood tumor cells on the blood that they grow in
4811 suspension in the liquid so they are floating so they will receive the drugs from everywhere
4812 from everywhere (.) and then you have also a different way to do the culture with it's called
4813 micro steps so you have a drop of medium and you let the cells grow in the drop of medium
4814 (.) so this way you avoid this problem that you are talking but this is not (.) an issue because
4815 they are attached only on one side (.) the other is always free

4816 44:16 **and one side is enough?**

4817 44:21 yeah it's worse in the body (.) hhh in the body you have cells everywhere and you don't
4818 have always like a side free (.) available (.) it's more difficult

4819 44:34 **much more worse uh?**

4820 44:35 yeah yeah

4821 44:38 **u:h so may be most of the time there is a problem of u:h the fact that the drug**

4822 **doesn't achieve its aim (.) it's not only efficient or not efficient effective or not effective (.)**

4823 **it's a problem of the whether it reaches the aim or not**

4824 44:54 the problem is in the animal ↓ yes this is the big issue

4825 44:59 **how can you make sure that whatever drug you're testing (.) the problem is in the**

4826 **fact that it doesn't reach or or it's not effective?**

4827 45:10 because you check (.) you check in the cells (.) in culture and if it's effective then you

4828 will go to the animal (.) and it's not working (.) then you check the levels in the blood (.) the

4829 stability of this compound (.) how is degraded by the level you can check on this

4830 experiment so you can know during that the drug in the body or the animal you can know

4831 how is degraded how is eliminated by the animal (.) for how long it stays in the blood (.) so

4832 you can already think ok you inject the drug and after 5 minutes there is no drug in the blood

4833 it's already eliminated degraded (.) then you start to suspect that the drug is not stable

4834 enough and that's why it's not working in animals (.) then you go to the chemist and say ok I

4835 want this compound to be more stable what can we do? (.) and

4836 46:06 **ok so you're getting me back to the other point now (.) so the blood can be**

4837 **eliminate the drug that was effective in the: cancer in the cells on the cells (.) it was**

4838 **tested on the cells it was ok (.) but then when you test it on mice the drug will eliminate**

4839 **it (.) this this case happens a lot?**

4840 46:25 yes (.) yeah I would say it's a problem

4841 46:29 **so so how do you explain that? that if you test on the cells it works (.) then when**

4842 **you test it on mice the blood rejects it (.) what is this is this that the culture cell culture**

4843 **that you're doing is not really mimicking the behavior of the blood**

4844 46:49 not of the blood (.) it's not degraded by the blood (.) it's degraded in the liver (.) you
4845 have the liver that is like a filter
4846 46:57 **liver ok**
4847 46:58 and they give mis (.) it's eliminated (.) it's not that the blood which trying the
4848 compound
4849 47:06 **ok**
4850 47:05 but could be also because you have the immune cells in the blood that can be in touch
4851 with the molecule (.) and they can try to: eliminate so how u:h to enactivate or something (.)
4852 so it's not the same uh the scenario it's much more complex and it's not easy to (.) to mimick
4853 (.) no it has clear limitations (.) it's the first step (.) the: ()
4854 47:34 **ok (.) so I understand that there is a problem of mimicking the human and uh**
4855 47:39 well it's not a problem (.) a limitation (.) you have to know that there is there is a
4856 limitation (.) you start with this (.) system then you go to mice (.) because you cannot go
4857 directly to mice (.) you will kill a lot of animals for nothing (.) so you need to start
4858 47:58 **what about improving this mimic (.) the way of mimicking**
4859 48:03 yes they are trying to (.)
4860 48:06 **because most of the time (.) from what I understand (.) it works on the cells but**
4861 **doesn't work on mice**
4862 48:13 Yes (.) in many cases yes (.) not most of the time (.) but in many cases yes (.) you don't
4863 see the same effect
4864 48:22 **and if it's not the same effect (.) you would understand that it's because (.) it's not**
4865 **the same conditions (.) there is a difference between working on cells and difference**
4866 **between working on mice**
4867 48:34 yeah (.) the lab ((laughter))
4868 48:38 **and that the mimicking system**

4869 48:39 yeah it's it's not perfect (.) no it's not more simple

4870 48:44 **what about the the role of the medium in this u:h**

4871 48:47 I don't think it's the:: I don't think there is a problem of the medium (.) it's not the

4872 problem

4873 **DILARA 18**

4874 32:04 **D'accord... do you think that the cells that are immediately glued to the wall (.) the**
4875 **wall of the container ah may not receive the drug that you test on the whole cell line?**

4876 32:17 quand tu dis wall c'est pas les parois?

4877 32:19 **les parois en fin**

4878 32:21 c'est le puits le fond?

4879 32:22 **le puits oui le fond**

4880 32:24 Le fond et c'était quoi la suite hhh j'ai pas hh

4881 32:24 **Est ce qu'elles ne reçoivent pas celle qui sont immédiatement collées à la paroi**

4882 32:33 uhm uhm oui

4883 32:33 **Est ce qu'il y a est ce que c'est possible qu'elles ne reçoivent pas le fin la la le**
4884 **médicament qu'on leur donne?**

4885 32:43 Non

4886 32:45 **non ça peut pas?**

4887 32:45 Non parce que en général c'est des culture qui s'appellent mono layers donc c'est des
4888 une seule couche de cellules EVIDEMMENT quand ils vont se chevaucher mais là quand tu
4889 veux multiplier tes cellules (.) mais en général tu fais des test quand il y a une seule couche
4890 de cellule (.)

4891 33:05 **Donc l'une à coté de l'autre y a pas y a pas les cellules l'une sur les autres**

4892 33:10 oui si on peut pas les empêcher parfois ils grimhhhpent ((laughter)) un petit peu
4893 comme ça

4894 33:13 **mais de toutes façons ça n'a rien à voir comme chez l'être humain un organe est**
4895 **beaucoup plus complexe**

4896 33:19 oui (.) je pense que c'est pas négatif pour la recherche si euh elles se touchent un peu
4897 trop

4898 **GAELE 18**

4899 24:40 **ok (.) do you think that the cells that are immediately glued to the wall of the**
4900 **containers may not receive the drug that you test on the whole cell line?**

4901 24:53 if

4902 24:54 **the ones that are immediately glued to the wall from the other side you don't have**
4903 **access to the because they are immediately glued to the wall (.) so u::h**

4904 25:04 but the cells it's a 3 dJoannesion

4905 25:09 **uhum**

4906 25:08 = staff even if the one side on the wall the other side is exposed to the drugs

4907 25:20 **so the other side of the cells are enough is enough? Because they take from there**

4908 25:24 it's all from yes

4909 25:28 **it's just enough to take from one side**

4910 25:31 yes

4911 25:31 **ok (.) and if we link this again to the question contamination (.) u::h if the cells**
4912 **take (.) medium from one side they don't receive it from the other side and they have a**
4913 **virus [**

4914 25:55 it's the::: as cells is an entity so everything in one cells is communicating with
4915 everything in the cells

4916 26:09 **so this is not an issue?**

4917 26:10 for me not

4918

4919 **Cédric 18**

4920 35:05 **ok do you think that the cells that are immediately glued to the wall of the**
4921 **container may or receive the drug that you you test on (.) on the whole cell line because**
4922 **they are glued to the wall**

4923 35:22 all you have a one layer u::h one layer of cell () so they always have like one half is
4924 stuck to the plastic but you also have the medium in contact of everything (.) if you have like
4925 (.) some time if you it's like you put one cell in this it's going to be 2 or 3 four five and et
4926 cetera and at the end you will have cell everywhere and if you leave like that they are going
4927 to go on each other but most if the time they will just stop growing no more space no more
4928 growing

4929 36:09 **ok**

4930 36:09 they just shut down the the (.) the::: dividing stuff so that they don't start to grow like
4931 that so you don't have a cell with one hundred cell on top of it

4932 36:26 **ok so if you're testing drugs you don't worry if they don't worry if they don't**
4933 **receive get the quantity of drug because they are glued to the wall is there this issue?**
4934 **no?**

4935 36:36 no (.) no because they always have (.) half of the cell is in the medium

4936 36:47 **again this issue of contamination there is no issue of contamination the ones that**
4937 **are glued to the to the container if they stay cancerous the others get the drug and they**
4938 **are cured somehow but immediately they are again contaminated by the one don't get**
4939 **the**

4940 37:06 no because you can't cure (.) it would work with something other than cancer you ()
4941 but you don't cure cell from cancer you just them some time you may be cure them I'm not
4942 sure you can get contaminate back by those who (.) it might it might be possible in some case
4943 I don't know (.) depend of may one specific stuff it can be possible (.) for for example I don't
4944 have this example in mind if you have like u::h a virus induced cancer (.) so you don't you
4945 don't already have the the virus the cancer so you have cell all the cell have the virus (.) if you
4946 kill the virus it's just and just have the cell without killing the cell yes of course may be it and
4947 they can be infected back by the virus if there is a cell

4948 **PAUL 18**

4949 16:20 **Ok now do you think that cells that are immediately glued to the wall of the**
4950 **containers may not receive the drug that you test on u:h on the whole cell line? and if**
4951 **they stay cancerous wouldn't that contaminate others that may have been cured? do**
4952 **you see the point?**

4953 16:39 well if and if you have cells which are glued on the the plastic the other half of the cells
4954 is clearly exposed to the medium so when you have a drug the drug has much more access to
4955 the cell in culture than in vivo (.) so it's part of the resistance u::h occuring is that you're
4956 never sure in vivo that the drug as efficient it could be will reach the target clearly (.) u:h so
4957 something which (.) is usually addressed when you you take into consideration the: the the
4958 physical chemical characteristics of the drug (.) it's true that if you have a a very and
4959 lypophilic drugs you may anticipate that it will better distribute in different layers of cells that
4960 if you have lypophilic u::h molecule very large which will have more difficut to go to to (.)
4961 but there is always this view that ok you kill first the first accessible cells when these cells are
4962 there they expose the cells endo the endolyne lay position to the drug these are why therapies
4963 in cancer are often administered for several days weeks in order to to offer the drugs to new
4964 cells hopefully offering them quicker then the cells do proliferate

4965

4966 **DALILA 18**

4967 18:27 **ok do you think that the cells that are immediately glued to the wall of the**
4968 **containers may not receive the drug that you test on the whole cell line? si les cellules**
4969 **qui sont carément**

4970 18:42 en périphérie?

4971 18:42 **collées**

4972 18:44 oui c'est ça elles ()

- 4973 18:47 **elles?**
- 4974 18:49 les cellules qui sont collées sur le bord du truc?
- 4975 18:52 **oui**
- 4976 18:55 elles ne reçoivent pas la drogue?
- 4977 18:55 **oui**
- 4978 18:57 si (.) puisqu'il y a du milieu dessus et le milieu il est:: la drogue est dans le milieu
- 4979 19:04 **donc elle circule à travers le la consommation du milieu?**
- 4980 19:12 dans une flasque u:h?
- 4981 19:15 **oui**
- 4982 19:17 dans une flasque où il y a du milieu il y a des cellules
- 4983 19:17 **oui**
- 4984 19:17 ces cellules vont pas pousser en dehors du milieu donc si on met un::: une molécule
- 4985 dans le milieu et qu'on homogénéise bien la remonte la concentration est pareille partout (.)
- 4986 donc la concentration que reçoit la cellule puisque le fil du milieu est sur la tête est toujours la
- 4987 même
- 4988 19:36 **donc il n' y a pas de problème**
- 4989 19:36 non
- 4990
- 4991 **JOANNE 18**
- 4992 28:05 **do you think that the cells that are immediately glued to the wall (.) to the wall of**
- 4993 **the containers (.) may not receive the drug that you test on the whole cells line? so if**
- 4994 **they (.) stay cancerous wouldn't they contaminate ther others that might have been**
- 4995 **cured? You know the containers you have the cells that are glued on uh to the wall (.)**
- 4996 **those that are immediately glued to the wall**
- 4997 28:42 yes

- 4998 28:41 **right?**
- 4999 28:45 yes I can understand ((laughter))
- 5000 28:45 **those one those ones they don't get the drug in them they don't get cured (.) they**
- 5001 **would contaminate the others (.) this issue of contamination gets back again so so you**
- 5002 **are treating and contaminating treating and contaminating is this not possible? because**
- 5003 **the cells are glued to the: to the flask to the container**
- 5004 29:13 non I don't think so
- 5005 29:17 **why**
- 5006 29:18 I don't think cancer is a matter of contamination
- 5007 29:24 **if it's a molecule**
- 5008 29:28 well (.) may be
- 5009 29:33 **especially that you have this issue of u:h uh resistance that you don't understand**
- 5010 **why exactly**
- 5011 29:42 Yes
- 5012 29:42 **So why you don't think so?**
- 5013 29:46 I don't know it's very complicated like (.) I don't think cancer cells they contaminate
- 5014 the other cells like if they are not treated
- 5015 30:01 **it's not that THEY contaminate (.) it's that (.) not they contaminate it's the**
- 5016 **molecule that is already there would again cause the sickness the disease**
- 5017 30:16 oh the you mean the molecule who are treating the cells? or the mol
- 5018 30:20 **no no no the molecule that's causing the cancer cancer**
- 5019 30:26 no because u:h see the molecule it's not like for example if you put a treatment who is
- 5020 cancérigène it's not only in fraction of a second of someday it will be u:h it will contaminate
- 5021 u:h the cells that they will become uh cancer cells it needs lot of time to have the mutations
- 5022 and to have everything and to accumulate lot of mutations

5023 30:57 **but they spend a lot of time in the medium and they're glued to to the: containers**
5024 **that's a lot of time**
5025 31:10 but who said that there is a molecule who it's
5026 31:19 **I'm not saying I'm s is this possible? is it possible that it is a molecule?**
5027 31:25 The medium didn't contain any concérigene molecule (.) it's just nutrients
5028 31:35 **ok**
5029 31:35 and water
5030
5031 **19. If the temperature and the co2 level that you are using in the cell culture happen to**
5032 **be not the same as the cells in the human body would have(.) does this cause the cell**
5033 **lines to be more resistant to drugs?**
5034
5035 **STEPHAN 19**
5036 47:27 **ok now if the temperature and the co2 level both of them ((I looked at the clock**
5037 **and noticed that the time we were running of time))**
5038 47:32 yeah we also have to do stuff yeah
5039 47:36 **in how much time?**
5040 47:36 like 5 to 10 minutes
5041 47:37 **ok perfect ok (.) so let's say if the temperature and the co2 level both together**
5042 **happen to be not the same as the cells would have been within the human body wouldn't**
5043 **the cell become more immune and more resistant to drugs unlike cells in rel bodies?**
5044 **The 2 conditions combined together that you give to your cells to your culture cells**
5045 **wouldn't that make the cells on which you work more immune? so they behave in a**
5046 48:15 oh yeah more yeah for sure they can be in effect so u:h indeed if there oh it I guess it's
5047 what you want to go is (.) like it's quite possible then may be that people are studying things

5048 then try to evaluate them in cell lines and I think if it doesn't work (.) may be they would test
5049 them in a body in vivo may be they would have found that'd be good for it that's possible
5050 48:43 **but usually you'd stop at the in vitro because it doesn't work**
5051 48:47 most of the time yes but you try to design your experJoannet in such a way that you are
5052 assuring it's possible about the: the efficacy with the drug
5053 49:01 **no I mean usually when it doesn't work in vitro**
5054 49:03 in vitro normally you don't continue
5055 49:05 **right**
5056 49:06 no
5057 49:06 **and if these 2 conditions of the co2 in particular and the temperature make the**
5058 **your cells immune more resistant (.) particularly cancer cells more resistant then you**
5059 **don't go to the in vivo**
5060 49:22 yeah but that's when and why you'll have to be really sure that ((laughter)) these
5061 conditions ((laughter)) but it's true it could be well like if you didn't consider it well and you
5062 would consider it well they would be in effect and I could imagine that uh positive findings
5063 could be missed
5064
5065 **BRIAN 19**
5066 48:53 **ok now if the temperature and the co2 level both of them (.) happen to be not the**
5067 **same as the cells would have been within the human body (.) wouldn't the cells become**
5068 **more immune and more resistance resistant to drugs unlike cells in real bodies?**
5069 49:19 I I don't think but there are drugs (.) that are activated by a certain pH(.) if you have
5070 compounds that when you have a pH of 6 instead of 7.4 which is the physiological (.) they
5071 are more active (.) and in the body you have reagents with this pH
5072 49:45 **you have? in the body you have?**

5073 49:44 you have for example in the colon (.) the collon is acidic it's between 5.5 and 6.5 the
5074 pH (.) so there this compound is more active than than in the: medium (.) so yes it's possible
5075 that there are some (.) fluctuations

5076 50:07 **no I mean the (.) the (.) if you combine the 2 conditions co2 and temperature (.)**
5077 **that you give**

5078 50:16 the temperature I wouldn't say it's chaning a lot inside of the body so I would say it's
5079 not a problem (.)

5080 50:23 **not a problem**

5081 50:23 but the co2 (.)yeah I woul say could be co2 acidity could be challenge

5082

5083 **DILARA 19**

5084 33:28 **uhum (.) Now if the temperature (.) and the co2 level (.) both (.) temperature and**
5085 **co2 level (.) happen not to be the same as the cell in the human body euh would have in**
5086 **the human body (.) would the cells become more immune and more resistance to drugs**
5087 **resistant to drugs unlike cells in real body. Donc le fait que la temprature n'est pas**
5088 **exactement comme si jamais dans le corps le niveau de co2 pas comme dans le corps est**
5089 **ce que ça peut jouer un rôle dans la résistance des cellules?**

5090 34:17 ça peut je pense avoir une influence maintenant je ne pense pas qu'on travaille de façon
5091 quantitative par rapport à ce qui se passe dans le cors d'un Homme donc peut tre que dans les
5092 conditions in vitro on va avoir un réponse de 10 et que si on était vraJoannet tip top dans les
5093 mêmes conditions que l'Homme on aurait une réponse de 11 mais finalement est ce que c'est
5094 vraJoannet important ? non il y a certainement tu vois une petite influence mais je ne pense
5095 pas que c'est tout blanc ou tout noir (.) parce que finalement c'est quand même quelque chose
5096 de relativement similaire (.) et on fait pas dans le quantitatif on veut pas comparer

5097 quantitativement ce qui se passe en in vitro par rapport à l'Homme (.) si on veut faire des
5098 comparaisons quantitatives c'est entre des résultats in vitro ou entre des résultats chez
5099 l'Homme mais pas les deux
5100 35:27 **très bien (.) do you trust**
5101 35:29 ((laughter))
5102
5103 **FL GAELLE 19**
5104 26:15 **ok (0.13) ok if the temperature and the co2 level (.) both (.) happen to be not the**
5105 **same as the cells would have within the human body (.) wouldn't the cells become more**
5106 **immune and more resistance resistant to drugs unlike cells in real bodies?**
5107 27:08 (0.3) it could (.) because can but
5108 27:16 **these conditions if the are not the same in the human body wouldn't that**
5109 **contribute to resistance (.) because this condition**
5110 27:22 It could be but it's depends what you are targeting and what the cells a::re a::re going
5111 to develop u:h in this u::h condition
5112 27:42 **but again the fact that every single research goes through the same condition (.)**
5113 **we don't know (.) there is no other labs in the world that try other different [**
5114 27:54 temperature I think that there are u::h the lab () I don't know which are () temperature
5115 stuff and so on but u::h I thought it's not (.) I don't remember what was this but it was may be
5116 it was 37 degress 35 degrees it's not
5117 28:23 **thet change?**
5118 28:23 yes the temperature I don't remember
5119 28:26 **on purpose they change?**
5120 28:27 on?
5121 28:27 **on purpose? exprès ?**

- 5122 28:30 Oui Yes
- 5123 28:32 **if why why you think they u::h**
- 5124 28:35 I don't remember exactly (.) but u::h
- 5125 28:38 **so they don't take it for granted this question of 37 degrees ?**
- 5126 28:41 no it's (.) no yes it's (.) the bader condition was that 37 degrees (.) but they are trying
- 5127 like u::h 5.) to: see if ²u::h how to say (.) I don't remember exactly she was looking about
- 5128 but::
- 5129 29:03 **ok let's**
- 5130 29:04 the basal condition was 37 degrees and she was trying I think to see what's happening
- 5131 to u::h like 35 degress 38 degrees
- 5132 29:16 **ok let's get back to the question then again it's (.) if the temperature and the co2**
- 5133 **level together are not the same in the human body in the different organs for example**
- 5134 **somone is working on collon cancer and the collon can the collon cancer in the body**
- 5135 **usully don't have 37 degrees it doesn't have 37 degrees and it doesn't have co2 level of**
- 5136 **5% (.) if you are working with 37 degrees and 5% of co2 level (.) would that cause more**
- 5137 **resistance? would that cause the cells**
- 5138 29:59 why not yeah
- 5139 30:00 **to be more resistant?**
- 5140 30:02 why not
- 5141 30:01 **and this is why most of research fail?**
- 5142 30:03 I don't know if it's why most of research fail but it could be one within among other
- 5143 that makes that the (.)
- 5144
- 5145

5146 **CÉDRIC 19**

5147 38:17 **ok now you have 2 conditions in the incubator so if the temperature and the co2**
5148 **level happen to be not the same as cells would have been within the human body 2**
5149 **conditions not exactly the same wouldn't the cell become more immune and more**
5150 **resistant to drugs un like cell in real bodies?**

5151 38:49 it can be also the opposite may be you'll have a drug that will be working I don't know
5152 the pH is dropping to 5 and then your drug is a chemical so if the pH change may be the ()
5153 change (.) it will connective then you put in the body and doesn't do anything

5154 39:07 **so in this case it works of the in vitro but doesn't work for in vivo ok**

5155 39:12 the opposite could be true also

5156 39:14 **and the opposite is true (.) and if you think about the opposite in particular**
5157 **because if you say that's true also that's even more serious because if ta if you know that**
5158 **most of of the research doesn't achieve they are thrown always right?**

5159 39:30 you could have thrown a good candidate because it didn't work in the lab but may be in
5160 the body it would have workso because the conditions are not the same

5161 39:39 **exactly so**

5162 39:40 but we're back on what I told you before you have to make sure that the phenotype of
5163 your cell ((recording finished here. About 5 minutes were lost))

5164

5165 **DALILA 19**

5166 19:38 **ok if the temperature**

5167 19:40 oui

5168 19:41 **donc la température d'un côté and the co2 level d'un autre côté les deux ensemble**
5169 **happen to be not the same as the cells would have been within the human body wouldn't**
5170 **the cells become more immune and more resistant? Est ce que le fait qu'on donne à ce**

5171 **ces cellules une température et un pourcentage de co2 qui n'est pas exactement dans le**
5172 **corps ça peut contribuer à la résistance de ces cellules?**

5173 20:23 oui peut être je sais pas

5174 20:25 **puisque'on ne comprends toujours pas ce que c'est que résistance**

5175 20:33 oui oui (.) je sais pas

5176

5177 **JOANNE 19**

5178 31:37 **now if the temperature AND the co2 level happen to be not the same as the cells**
5179 **would have within the human body not exactly the same**

5180 31:51 uhum

5181 31:52 **wouldn't the cells become more immune and more resistant to drugs? in vitro**
5182 **unlike the cells in real bodies?**

5183 32:04 yes

5184 32:05 **and if they become like that**

5185 32:08 uhum

5186 32:09 **they would say ok this drug doesn't work so we're not gonna do in vivo (.) so does**
5187 **that mean that you're losing a lot of time and efforts and money doing a lot of research**
5188 **that really cause them to be more resistant and you conclude that ok this doesn't work**
5189 **let's do something else knowing that most of the research is thrown in vitro and you**
5190 **don't go to in vivo**

5191 32:41 yes if like the temperature and the co2 is the the same it will surely affect the cells (.)
5192 so if the cells are living in such a condition which is not the same thing as the condition
5193 inside the body so that means that the cells u:h acquérent

5194 33:03 **acquire**

5195 33:04 acquire like some resistance like another phenotype to live in such conditions (.) so it
5196 should it will not be like u:h (.) the affect of the drugs in those cells may not be the same
5197 thing on like cells in the: inside the body (.) so may be there is an effect

5198 33:38 **there is a risk?**

5199 33:39 there is s a risk yes

5200

5201 **20. Do you trust that the company from which you buy the medium is providing you**
5202 **with the medium that you really want?**

5203

5204 **STEPHAN 20**

5205 49:45 **ok do you trust that the company from which you buy the medium is giving you**
5206 **the medium that you want?**

5207 49:50 u::h ye:s I find some are quite well (.) they are (.) at least there is still test reports that
5208 you can request and (.) a::nd also the company at least I always have been using and I've
5209 never had any problems so it's at least in my own experJoannets I I found them to be very
5210 reliable and if there will be strange effects may that we would notice and it will be very bad
5211 when () ((laughter))

5212 50:27 **((laughter)) ok**

5213 50:28 there will be other business very very fast so I don't think they can afford themselves
5214 (.) but some companies yes I also have noticed that the: quality is not always consistent so
5215 people have to be we have to aware of the quality of the medium uh and match the bad
5216 variances

5217 50:46 **ok do you remember the components of the medium by heart or what is**
5218 **important for you is as long as they the cells are alive it means that the medium is fine**

5219 51:00 u::h I just I don't know it by heart but when I start an experJoannet I ::: do a little study
5220 of what medium to use a:nd so when I go (.) at the moment like ok this good or what should
5221 be into the medium and I check this and if that is fine with me then I would proceed with my
5222 further experJoannets but I make a well thought choice of a medium before I start my
5223 experJoannet (.) I don't just take one medium a (.) I really choose like what medium to choose
5224 if there is many different ones

5225 51:44 **that's when it's part of your research**

5226 51:47 ↑ it's part of my research yeah so I really before I start like a new studying and I know
5227 what cells to use I will () medium is used (.) what is the importance so (.) certain factors or
5228 components in this medium and based on that I will choose which medium to use

5229 52:06 **yeah but that only when it makes part of your research protocol it's part of what**
5230 **what you want to test but suppose that not what you want to test you work for example**
5231 **on drugs or whatever you would not think usually you don't think about what kind of**
5232 **medium you need or whether you want to change this or that you go for a standard one**
5233 **right?**

5234 52:29 uhum

5235

5236 **BRIAN 20**

5237 50:32 **ok now do you trust that the company from which you buy medium is giving you**
5238 **the medium that you want?**

5239 50:39 yes (.) I trust

5240 **50:44 do you remember the components of the medium by heart?**

5241 50:48 no (.) it's a long list ((laughter)) you know the the: the critical like the glucose pyruvate
5242 lactate (.) the: glutamine normal acids and amino acids (.) you know more or less (.) but you

5243 don't know the serum you know that you need to grow factors (.) the grow factors to make
5244 the cells to be () but I don't know it by heart

5245 51:18 **you don't know by heart so what is important for you is that as long as the cells**
5246 **are alive that means that the medium is fine?**

5247 51:25 no (.) well this is important but the: (.) it's good it's important that the composition
5248 doesn't change (0.3) it's important that the composition doesn't of the medium is always the
5249 same
5250

5251 **DILARA 20**

5252 35:30 ((laughter)) **do you trust that the company from which you buy the medium is**
5253 **giving you the medium that you want?**

5254 35:38 I hope so ((laughter))

5255 35:41 **((laughter))**

5256 35:45 euh (0.2) oui (.) oui ils me donnent le milieu euh que je lui ai demandé maintenant
5257 quand je lui demande 4,5 gramme de glucose par litre il y en a peut être 4 virgule cinq cent
5258 UN gramme mais ça c'est toujours les marges (.) en fait quand euh quand les firmes
5259 produisent des produits ils ont une espèce de cahiers de charges à suivre et dans ces cahiers
5260 de charges ils trouvent les marges d'erreurs (.) qui sont dus à différents éléments et donc si
5261 l'objectif est d'avoir 4,5 gramme ben peut être qu'ils autorisent à avoir 4, 49 et 4,51 (.) donc je
5262 pense que le milieu que je reçois est très proche de ce que j'ai commandé (.) du moins ça se
5263 trouve dans les marges d'erreurs

5264 36:41 **et si c'est 4,7 ou 8 ou 9 ça change? quelque chose?**

5265 36:45 ça change oui pour euh les résultats certainement (.) oui (.) maintenant si quelque chose
5266 (.) il y a aussi soit () avec soit c'est sur demande (.) mais on peut voir accès justement à ces
5267 euh à ce cahier de charges parce qu'ils vendent le produit comme faisant 4,5 mais on peut

- 5268 demander tiens quelle est votre marge de manœuvre? est ce que un produit à 4,9 vous le
5269 vendez quand même? et si eux ils fixent leurs limites à 4,9 ben du coup il sera vendu et je
5270 pourrais l'utiliser ah ()
- 5271 37:21 **Est ce que vous demandez réellement ou tu dis on peut demander? donc**
5272 **généralement tu penses que les gens demandent chaque fois?**
- 5273 37:27 On général non je pense pas (.) non
- 5274 37:31 **Donc les gens achètent et (.) ils font confiance?**
- 5275 37:32 oui
- 5276 37:33 **et c'est tout?**
- 5277 37:34 oui
- 5278 37:35 **Et donc à ce niveau là donc it's a matter of trust donc tu tu tu as besoin de faire**
5279 **confiance à ces gens là? sinon euh tu vas pas jusqu'à euh vérifier?**
- 5280 37:48 Dans le milieu académique on ne vérifie pas (.) en industrie là ils vérifient (.) là ils
5281 vérifient il y a tous (.) il y a un processus de qualité qui se met en place (.) entre le vendeur et
5282 l'acheteur (.)
- 5283 38:04 **Mais toi en tant que chercheuse [**
- 5284 38:06 mais ici au milieu
- 5285 38:05 **ça t'intéresse pas de [**
- 5286 38:06 dans le milieu académique on fait pas de vérification
- 5287 38:10 **Non (.) toi en tant que chercheuse ça t'intéresse pas de de vérifier quelque chose**
5288 **qui va jouer un rôle comme tu disais important sur ta propre recherche ?**
- 5289 38:20 Je pense que ce serait intéressant (.) maintenant euh dans la vie on peut pas tout faire (.)
5290 et on peut pas le faire parce qu'on n'a pas les moyens et parce qu'on a pas le temps (.)
- 5291 38:33 **D'accord (.) donc sur le niveau d'un chercher ou d'un laboratoire on va dire c'est**
5292 **pas c'est pas facile ou c'est pas jouable ou c'est pas pratique**

- 5293 38:43 [non
- 5294 38:43 = **de le faire (.) ça c'est claire**
- 5295 38:45 C'est je pense irréalisable parce qu'on est trop petit
- 5296 38:48 **et même euh en fin on va parler d'abord de l'individu (.) un individu ou un**
- 5297 **chercheur c'est vraJoannet pas possible [**
- 5298 38:55 non
- 5299 38:55 = **de chaque fois vérifier tout ça c'est clair (.) maintenant si on parle de l'impact**
- 5300 **que ça peut avoir sur ta recherche si jamais ces gens là te donnent des choses**
- 5301 **vraJoannet pas dans ce qu'ils disent dans le [**
- 5302 39:12 maintenant il y a pour moi il y a deux situations il y a une situation où en fait depuis le
- 5303 début ils vendent un produit qui n'est pas conforme donc tu ne te rend pas compte finalement
- 5304 que le produit n'est pas conforme et tu tire des conclusions qui sont fausses mais tu te rend
- 5305 jamais compte (.) où alors tu as commencé ta recherche avec un produit conforme et puis
- 5306 pour une raison X ou Y le produit n'est plus conforme (.) et alors là c'est l'esprit scientifique
- 5307 qui doit travailler dire bien c'est bizarre j'ai des résultats un peu étranges et donc à partir de ce
- 5308 moment là il faut décortiquer toute l'expérience pour identifier d'où vient le problème (.) et ça
- 5309 ça m'est déjà arrivé aussi (.) on passe des commandes et puis on reçoit un produit puis on se
- 5310 rend compte que ça fonctionne p l'expérience ne fonctionne plus alors qu'elle a toujours
- 5311 fonctionné et donc on fait différents test on décortiques toutes l'expérience et puis on identifie
- 5312 le problème (.) donc pour moi il y a deux situations (.) la situation où on est donc
- 5313 compléhhhtment ((laughter))
- 5314 40:14 **Dans dans dans dans tous les cas (.) on a on a on peut rien faire c'est que de faire**
- 5315 **confiance à ces gens là jusqu'au jour où on découvre quelque chose ah?**
- 5316 40:24 au niveau académique oui
- 5317 40:28 **D'accord**

5318 40:28 parce qu'on est pas assez grand (.) en industrie ils sont suffisamment grand ils ont assez
5319 de puissance pour euh pour le faire

5320 40:35 **et ça c'est le cas pour tous les laboratoires ah dans le monde? c'est**
5321 **pas nécessairement petit grand moyen laboratoire**

5322 40:40 les laboratoire de recherche à l'université (.) maintenant les laboratoires de recherche
5323 chez GSK chez Unilever chez Bakster UCB eux là ils font les vérifications (.)

5324 40:53 **tu penses que pour chaque recherche le chercheur a intérêt à à vérifier**
5325 **vraJoannet ce qu'il met dans la [**

5326 40:59 c'est pas le chercheur qui le fait (.) mais ils ont en fait des procédés de qualités mis de
5327 qualités mis en place et donc au début ils font systématiquement la vérification puis à partir
5328 d'un certain moment ils disent ok on fait confiance et puis après ils font la vérification de
5329 façon aléatoire (.) une fois sur cin::q ou euh une fois sur dix (.) et puis si ça se passe bien ben
5330 voilà ils continuent comme ça (.) et si un moment il y a un mauvais résultats ils disent
5331 attention il y a un mauvais résultat et là ils recommencent à faire le résultat euh à faire le test le
5332 test sur chaque lot qu'ils reçoivent

5333 41:41 **Ah d'accord et tu es au courant qu'ils s'est passé des fois que ils ont découverts**
5334 **que finalement qu'ils étaient en train d'utiliser euh un type de par exemple milieu qui**
5335 **n'était pas vraJoannet conforme à ce qu'on [**

5336 41:53 Dans l'industrie je sais pas je n'ai pas connaissance de ça parce que tout est tellement
5337 cadré que je ne sais pas s'il y a des choses qui passent à travers les mailles du filet (.) parce que
5338 tout est testé tout tout hhh ((laughter)) ils testent hh tout ((laughter))

5339 42:13 **et ce qu'on teste que vous utilisez ici? académiquement c'est le même?**

5340 42:16 oui

5341 42:18 **D'accord (.) donc do you remember the components of the medium by heart?**
5342 **when you have to do culture cells and you need the medium even though you are not**

5343 **working on the medium that the objective of your research is different (.) but do you**
5344 **have to remember the components by heart or what is important for you is that as long**
5345 **as the cells are alive and growing it means that medium is fine? Quelque soit l'objectif**
5346 **de ta recherche (.) pour toi tu vas te dire bon moi je vais travailler sur ça ça ça et ça bon**
5347 **(.) il me faut maintenant on vas passer par la culture cellulaire bob qu'est ce qu'on fait**
5348 **pour la culture cellulaire? on utilise ce milieu on va utiliser ce milieu neutre quoi**
5349 **standard est ce que tu pense que tu as besoins de quand même retenir ou apprendre**
5350 **parce que ce milieu par cœur ou connaitre par cœur ce que c'est dans le dans le milieu?**
5351

5352 43:18 Je pense que tous les composants du milieu non (.) parce qu'il y a des composés qui
5353 sont essentiels à la vie (.) des cellules quoi qu'il fasse (0.2) et il y en a d'autres qui sont
5354 importants parce qu'ils ont un impact sur l'expérience et ceux là il faut les connaitre (.) mais
5355 les connaitre tous non (.)

5356 43:47 **c'est c'est pa::s c'est pas un biais donc pour la recherche? (0.2) c'est vrai que tu**
5357 **travailles sur un aspect ici ça c'est clair (.) tu peux pas tout tester ça on comprend mais**
5358 **en même temps si on met quelque chose fin une molécule peut changer tout non? des**
5359 **fois**

5360 44:07 oui mais il y a des molécules qui sont quoi qu'il en soit tu es obligé de les avoir (.)
5361 sinon la cellule meurt même si elle a un impact sur euh ton traitement tu peux quand même
5362 pas t'en passerhhh ((laughter)) donc tu peux pas faire faire sans t'es obligé de l'avoir il y a des
5363 acides aminiques qui sont essentiels à la survie de d'une molécule ou même par exemple
5364 l'oxygène tu peux pas travailler sans oxygène sinon tes cellules meurent et pourtant l'oxygène
5365 peut oxyder certaines molécules et donc t'auras un impact après sur ((noise)) sur ta molécule

5366 44:47 **Bon moi j'ai pas dit nécessairement les enlever ou ne pas les utiliser mais au moins**
5367 **connaitre les composantes**

5368 44:55 tu connais les composants parce que t'as la la fiche technique qui est envoyée avec la::

5369 45:01 **milieu**

5370 45:01 Le milieu et voilà tu sais qu'ils sont là et point barre mais (0.2) voilà c'est quelque c'est

5371 quelque chose d'obligatoire oui si c'est l'oxygène tu es obligé d'en avoir les acides aminés tu

5372 es obligé d'en avoir donc tu te poses pas la question parce que une recherche (.) même si on

5373 ne parle pas de les enlever mais une recherche sans ça ça ne sert à rien

5374

5375 **GAELE 20**

5376 30:18 **ok (.) do you trust that the company from which you buy the medium is giving**

5377 **you the the medium that you want?**

5378 30:26 so if it's the composition?

5379 30:29 **yeah**

5380 30:29 normally they have to give you u::h yh a quality::: quality certificate (.) when you

5381 order you can see the concentration of each u::h component and they have to make quality

5382 control (0.2) to be sure that the concentration are in the range that they said

5383 31:00 **do you remember the components of the medium by heart?**

5384 31:04 all?

5385 31:04 **yeah**

5386 31:04 the concentration and so on?

5387 31:06 **yeah**

5388 31:06 generally there are aminoacides glucose u::h vitamins ions u:h sometimes that are stuff

5389 to buffer the medium and:: phenol red to make the color to see the pH and color the mediu

5390 31:29 **so you don't really care about the these details as long as it is (.) how true is this?**

5391 **as long as you see that your cells are growing and live not dying so for you the medium**

5392 **is ok?**

- 5393 31:46 Since the cells are growing?
- 5394 31:48 **since the cells are growing normally u::h since**
- 5395 31:51 may be may be if we had some u::h some stuff inside may be the cells re growing
- 5396 better but u::h the cells who developed THE the company who developed the cancer cell lines
- 5397 tested different media and they s::: sell the recipe?
- 5398 32:16 **uhm**
- 5399 32:16 of the medium to be the one that is better for the cells (.) may there are other conditions
- 5400 that would be better but u::h these conditions seems to be the best one for the growth of the
- 5401 cells
- 5402 32:31 **so you don't of the time think of the medium how may be you need to rethink it**
- 5403 **may be you need to doubt may you need to**
- 5404 32:44 yes but if we doubt everything we'll not do we're not we'll not u::h go
- 5405 32:52 **you cannot advance**
- 5406 32:52 go avancer?advance
- 5407 32:54 you cannot improve
- 5408 32:56 **bu this is a central condition because everything goes through the incubator and**
- 5409 **the medium there is no single research that doesn't go through this (.) it's not like any**
- 5410 **everything**
- 5411 33:06 yes but there are already people tested u::h the medium to see if the cells are growing
- 5412 or not in
- 5413 33:16 **for you growing is the issue if it's growing that's fine then**
- 5414 33:19 if it's growing in the right way yes
- 5415 33:22 **but what about contamination?**
- 5416 33:25 of the::: contamination with what?
- 5417 33:29 **why would for example most of the cells cancer cells resist to drugs?**

5418 33:36 because it's cancer cells first ((laughter))

5419 33:40 **but why why they resist to drugs?**

5420 33:41 even even::: even the body if even if in human body there are cancer cells who resist to

5421 drugs

5422 33:50 **uhm**

5423 33:51 and there are not medium or in the flask (.) because the cancer cells are able to develop

5424 u::h a mechanism to resist

5425 34:04 **why some drugs work at the beginning and then there is a regression and**

5426 34:06 because the cells develop resistance

5427 34:09 **but what this resistance?**

5428 34:11 becaue they u::h send that that they are lacking something (.) and so they try to escape

5429 and to u::h to develop a mechanism to growth to grow and to::

5430 34:27 **there is no issue of contamination here but some uh cancer cells contaminate the one**

5431 **that were cured and then they again there is cured and then**

5432 34:35 yes (.) but u::h it's u::h may be there is 2 cells may be the guy is cured but there are 2

5433 cells for resist and they will growth again and make a new tumor (.) it's the resistance

5434 34:54 **ok to go back to the same question now for v so for you you don't need to doubt**

5435 **the medium as long as there are people**

5436 35:07 we have to to to be sure with what we are working but u::h we::: we cannot always

5437 doubt about everything otherwise we'll not

5438 35:21 **advance**

5439 35:20 adavance

5440 35:22 **ok that's for you I understand in your case because you have to wor you have a**

5441 **protocol you have to work on other things you cannot stop and analyze the medium and**

5442 **whatever but I'm taking about about the research in general does research the whole**

5443 **body of research needs to take this into consideration and rethink especially that this is**
5444 **a central a central condition that everyone is using may be it's not something that is**
5445 **marginal what do you think?**

5446 35:51 yes (.) we could u::h make for example a lab only working on this

5447 36:02 **it doesn't exist?**

5448 36:05 may be but I don't know (.) but for example the company and so on are working also
5449 on this it's parallel I think

5450 36:16 **the company is research company or pharmaceutical? it's just may giving you the**
5451 **product so (.) that you want**

5452 36:26 but the like u::h a company for research (0.3) for example the company will selling the
5453 stuff with the flow medium ((coughing)) this kind of company may be are doing research on
5454 u::h the:: test condition to make growing cells

5455

5456 **PAUL 20**

5457 18:22 **ok do you trust that company from which you buy the medium is giving you the**
5458 **medium that you want? for example you trust that they don't contain molecules that**
5459 **should not be there and that you cannot check or detect unless you know the type of**
5460 **melecule in particular and you go for it**

5461 18:44 I trust them yes (.)

5462 18:50 **and if suppose there is a molecule that should not be there is this u:h how how**
5463 **how dangerous can this be? or how [**

5464 19:00 well it can lead to misinterpretation for sure

5465 19:08 **so (.) so you just need to trust because there is no other way to do?**

5466 19:15 there is no other way to do (.) sometimes (.) I would say in my career may be I
5467 encountered may be 2 episodes of bizarre results that we tried to understand u::h and we

5468 identify some some aspects u:h being related to u:h the medium or the serum we used as
5469 being the the likely even for explaining the difference we observed (.) so I would say in a 25
5470 years I've b b I have been for 20 years I've been facing a problem of such a problem because
5471 something not being as it was before (.) that's the only way I could identify if there is
5472 something occurring

5473 20:10 **so the only the only way that you start doubting or being you know alarmed is**
5474 **when you see the the cells are not growing enough or dying or there is a major change**
5475 **in the phenotype that you can observe (.) but if there other molecules that you cannot**
5476 **observe you cannot see the but they are constantly there because you are buying the**
5477 **medium from the same company or providers in the world are any way 5 or 6 or 7 in**
5478 **number so u:h**

5479 20:41 yes yes it it is while your research is (.) becomes (.) u:h (0.3) u:h a new step if and only
5480 if what you have showed is reproduced in another lab on another cell line u::h by another
5481 biologist u:h so we do contribute as (.) as much as we can the best we we can u:h to the the
5482 the global knowledge (.) but the needs to come for the labs to u:h to reproduce your results is
5483 is is (.) it's part of the game and this probably u:h u:h it's a way to avoid the kind of u:h of u:h
5484 confusing results which will be due to something specifically in your in your medium u:h (.)
5485 we are more and more asked when we do publish papers or when we do submit papers to not
5486 to only show things in with one cell but to show that it is a general pathway involving
5487 involving several cell lines which are not always cultured in the same kind of medium (.) so
5488 that what you propose as an hypothesis u:h as a mechanism is something which is not unique
5489 to you or to one given cell line but which is applicable

5490 22:15 **do researchers need to remember the components of the medium by heart? or**
5491 **what is important for them is as long as long as the cells are alive and growing it means**
5492 **that the medium is fine ?**

5493 22:29 again because of the core business of the lab (.) we we my (.) students my post docs
5494 myself we are we are more aware of what is in the medium(.) but again this understanding is
5495 even for us limited (.) we know several things and we know that I think clearly in a more
5496 elaborated way then many other labs who do not work on metabolism and the role of
5497 nutrients u::h so it's important for us to consider that medium and the content is not exactly
5498 the same and can influence the phenotype of your experJoannet (.) butsss no body will know
5499 (.) could tell you about the exact concentration of each salt amino acids vitamin in the
5500 medium (.) but whether they are glucose pure () u:h glutamine u:h serin these kind of things
5501 is now more and more known by the by the people because (.) we know that this not u:h
5502 anecdotal

5503

5504 **DALILA 20**

5505 20:40 **ok do you trust that the company from which you buy the medium is giving you**
5506 **the medium that you want?**

5507 20:45 non (.) il ya des variations

5508 20:50 **comme quoi?**

5509 20:50 puisque c'est de la production donc d'oice ils produisent jamais pareil (.) après u:h
5510 j'espère que ça soit eu:h assez reproductible mais euh je pense pas que ce soit 100%
5511 identique

5512 21:10 **combien de firmes il y a tu penses dans**

5513 21:12 des milieux?

5514 21:13 **oui**

5515 21:15 beaucoup

5516 21:17 **beaucoup beaucoup?**

- 5517 21:17 < oui (.) je dirais comme ça mais je sais pas après euh u:h il y a les généralement les
5518 plus connus ah (.) il y a les plus connus et puis parfois c'est une question de prix ou (.) ou
5519 c'est des milieux très: très pointue pour certains types de lignées certaines cellules très: qui
5520 sont très comment dire très très rares mais sinon je pense que il y a beaucoup pour moi quinze
5521 vingt aucune idée quinze vingt firmes qui font >
- 5522 21:51 **ok**
- 5523 21:52 par rapport () et tout ↓
- 5524 21:55 **do you remember the components of the medium by heart or what is important is**
5525 **as long as the cells are alive and growing it means that the medium is fine**
- 5526 22:05 () on connaît on connaît le milieu
- 5527 22:07 tu **en connais?**
- 5528 22:08 mais les milieux qu'on achète tout fait?
- 5529 22:10 **oui tout fait**
- 5530 22:11 ou ce qu'on rajoute dedans? ah non non tout fait je connais pas généralement c'est
5531 secret en plus (.) pour mais de mémoire on devait chercher les compositions des milieux et
5532 les 3/4 du temps tu sais pas puisque oui ok tu utilises ça ça ça et ça mais ils te disent pas tout
5533 parce que n'importe qui peut faire la même recette que et le vend moins cher
- 5534 22:37 **tu peux expliquer un peu plus?**
- 5535 22:40 chais pas coca cola
- 5536 22:40 **les doctorants les doctorants**
- 5537 22:43 = il y a dedans de la caféine mais on sait pas exactement ce qu'il y a dedans (.) les doc
5538 u:h les doctorants savent (.) ce que l: on veut bien leur dire
- 5539 22:51 **attend**
- 5540 22:51 ce que la firme veut bien dire
- 5541 22:53 **hhh quand les doctorants vont commencer une culture cellulaire**

- 5542 22:58 oui
- 5543 22:59 **ça dépend du sujet de leur thèse bien sur**
- 5544 23:01 oui
- 5545 23:02 **et les doctorants u:h post docs aussi u:h: est ce qu'ils vont se demander se dire**
- 5546 **quel milieu je vais utiliser?**
- 5547 23:09 u:h généralement soit c'est un milieu qu'on a ici dans le laboratoire et donc on leur dit
- 5548 quel milieu utiliser ou alors ils vont voir sur un site style u:h la TCC où la il y a le milieu
- 5549 recommandé donc la TCC c'est une espèce de librairie qui reprend tous les types cellulaires et
- 5550 qui dit telle cellule vit dans tel milieu
- 5551 23:34 **ils passent pas beaucoup de temps à y réfléchir?**
- 5552 23:37 pourquoi passer du temps à réfléchir?
- 5553 23:40 **non par rapport au:::**
- 5554 23:42 après si:: tu veux étudier certains composants qui sont dans tes milieux alors là tu vas
- 5555 faire la recherche de savoir qu'est ce que j'ai dans mon milieu si je vais étudier le glucose est
- 5556 ce que je vais étudier l'impact glucose après on regarde voilà est ce que j'ai du glucose dans le
- 5557 milieu ou pas
- 5558 23:59**on prenons l'exemple des recherches qui testent un certain une certaines drogue**
- 5559 24:04 oui
- 5560 24:07 **donc un médicament**
- 5561 24:08 oui
- 5562 24:08 **donc on on n'étudie pas vraJoannet le**
- 5563 24:12 le métabolisme
- 5564 24:11 **du tout**
- 5565 24:13 on étudie

- 5566 24:14 **juste on veut tester ce médicament ces ces ces lignées cellulaires (.) est ce qu'ils**
- 5567 **vont se demander beaucoup sur le milieu ou ils**
- 5568 24:20 Je crois qu'ils vont regarder u:h de quoi il est composé donc tu vas sur le site de la
- 5569 firme tu sors la composition de ton milieu comme ça tu l'as en tête mais u:h tu sais rien faire
- 5570 de plus (.) que croire ce qu'on te dit
- 5571 24:36 **c'est la firme qui dit?**
- 5572 24:36 oui (.) donc l' ATCC dit voilà pour tel type de lignées cellulaire utiliser tel milieu puis
- 5573 tu vas sur la firme tu regardes ce milieu là il contient ça ça ça mais
- 5574 24:52 **mais je sais pas là c'est la firme qui fin c'est un sujet qui n'a pas d'importance?**
- 5575 **c'est la firme qui va dire ah tu utilise ça et c'est tout alors tout le temps tes cellules sur**
- 5576 **lesquels tu travailles sont là**
- 5577 25:04 ah si c'est bien sur c'est important mais c'est u:h après c'est des guidelines que tu as si
- 5578 tu veux que tes cellules prolifèrent bien l'A TCC qui est c'est quoi? la TCC c'est
- 5579 l'abréviation? c'est une librairie vraJoannet de cellules comme
- 5580 25:18 **non mais le but c'est pas seulement de qu'ils prolifèrent bien le but c'est est ce que**
- 5581 **de savoir (.) par exemple est ce qu'il y a des molécules dans ces milieux qui empêchent**
- 5582 **mon travail qui m'empêchent de**
- 5583 25:30 ah oui ça après si tu veux ça après à toi de chercher (.) la firme ce que contient ton
- 5584 milieu auprès de la firme ce que contient ton milieu
- 5585 25:42 **donc les doctorants et post docs vont demander réellement**
- 5586 25:45 oui j'espère je pense
- 5587 25:46 **ce milieu là qu'est ce qu'il contient exactement?**
- 5588 25:47 voilà oui
- 5589 25:49 **et il faut**
- 5590 25:50 sur internet tu trouves tout ça oui

- 5591 25:51 **et il faut u:h il faut donc croire à ce que dit la firme?**
- 5592 25:58 oui
- 5593 26:00 **puisque'elle te dit il ya ça ça ça c'est tout**
- 5594 25:59 oui
- 5595 26:02 **Est ce qu'il y a un risque qu'il y ait des molécules et non pas juste les composante**
- 5596 **glucose etc. vraJoannet des molécules qu'on peut pas tester ici vérifier? puisqu'il y a des**
- 5597 **millions de molécules dans ce monde donc une infinité de molécules**
- 5598 26:14 dans le milieu qui pourraient inter:::féer
- 5599 26:15 **oui**
- 5600 26:17 et ben peut être je sais pas
- 5601 26:19 **et donc u:h les cellules sur lesquelles on travaille (.) sont dans un milieu qu'on**
- 5602 **achète de chez une firme**
- 5603 26:29 oui
- 5604 26:28 = **qui peut contenir u:h des molécules qui vont à l'encontre de mon travail et cette**
- 5605 **condition elle est partout dans dans toutes mes recherches**
- 5606 26:38 oui
- 5607 26:36 **donc il faut que je crois à ce que dit u:h**
- 5608 26:41 oui ((laughter))
- 5609 26:45 **mais c'est ça (.) maintenant qu'est ce que tu penses par rapport à ça? à cette idée**
- 5610 **là? à cette condition là?**
- 5611 26:53 on sait pas faire autrement
- 5612 26:56 **d'accord (.) on sait pas faire autrement**
- 5613 26:59 Parce que par exemple nous on fait nos milieux nous même mais on a quand même de
- 5614 toutes façons une base qu'on achète faite (.) il y a de toutes façons on a de toutes façons une

5615 base mais c'est comme ce qu'on achète dans le super marché on peut espérer que c'est bien du
5616 bœuf et pas autres choses (.) c'est la même chose

5617 27:20 **donc les molécules peuvent changer u:h peuvent changer biaiser les les**
5618 **recherches?**

5619 27:25 ah oui comme manger du cheval en pensant que c'est du bœuf et attraper quelque chose
5620 (.) c'est la même chose

5621

5622 **JOANNE 20**

5623 33:45 **Do you trust that the company from which you buy the medium is giving you the**
5624 **medium that you want?**

5625 33:54 yes why they will not give (.) the medium what wehh I don't hh ((laughter)) may be
5626 other people will have u:h a good answer than me

5627 34:15 **don't you think that they can make mistakes?**

5628 34:17 everybody can make mistakes

5629 34:20 **and you're building on their mistakes (.) research**

5630 34:28 yes but I don't really know if they say the medium you ask medium like that and get it
5631 so may be there will be mistakes because it's machines who are preparing everything

5632 34:45 **specially that the providers these companies give to hunderds or thousands of labs**
5633 **in the world**

5634 34:52 yes

5635 34:55 = **it's not like uh they only give to you (.) their kind of affecting uh all labs or may**
5636 **let's say uh thousands of labs or hundreds so it's not only affecting your research only**
5637 **not only your research so what do you think about this condition?**

5638 35:12 I don't know but if they will sell such a thing it should be always a control that happens
5639 inside their labs to to those medium and to machines who will do those things but we can't
5640 say there is zero mistakes? there is always mistakes somewhere

5641 35:34 **however this is something central this is something on you constantly build on it**
5642 **it's not like any other details**

5643 35:42 yes but see when you do an experJoannet you will not (.) do it only once or twice to
5644 35:53 **but you're always using their medium**

5645 35:57 yes but see that doesn't mean the first flask is like if the first flask there is a mistake on
5646 it (.) that means the other ones there is a mistake also

5647 36:13 **if the same product you're buying from the same company**

5648 36:14 so the medium you are always doing a new medium all the time you're preparing a
5649 new one so it's not just one flask you buy and you use for uh all the experJoannets for all the
5650 lab sometimes it will end and you'll change and prepare a new one

5651 36:38 **do you remember the components of the medium by heart? or what is important**
5652 **for you is as long as the cells are alive it means that the medium is fine?**

5653 36:53 I know what I put inside my medium

5654 36:55 **you know?**

5655 36:56 not exactly the concentration yes

5656 37:03 **so you know everything whatever is in the medium?**

5657 37:11 yes but see for example: uh you put for example Dmem powder (.) I don't know
5658 exactly what is Dmem but I know it's good for the cells see we use it but exactly what is
5659 contained in the powder I don't know

5660 37:30 **so for you it doesn't matter you only want to use the ingredients that are said to be**
5661 **important for the: for the cells to keep alive right?**

5662 37:43 Yes

5663 37:43 **that's what matters for you?**

5664 37:45 Yes

5665 37:46 **but does this mean that the issue of the medium and what it exactly contains is**
5666 **neglected? no body is thinking about it today?**

5667 37:58 because the medium is is changing from experJoannets to other like for example you
5668 are working in the cells that needs uh this this this thing you'll you will put in your medium
5669 what the cells the cells need but not u:h everything

5670 38:19 **but how is this change decided? why for example this research says ok I want this**
5671 **medium based on what? it's his own research or it's ok because he knows that for this**
5672 **type of research you need this?**

5673 38:38 it's a it should be like from uh old experJoannets like there is like in internet if you will
5674 culture such type of cells you culture in in this medium what this concentration

5675

5676 **21. Are there risks that if the medium components are not exactly as they are described,**
5677 **they would make the cells develop resistance to drugs, or different protein**
5678 **expression? Or what else?**

5679

5680 **STEPHAN 21**

5681 52:31 **so the next question is are there risks the last question are there risks that if the**
5682 **medium components are not exactly as they are described they make the cells to develop**
5683 **resistance to drugs or in protein expression or what else?**

5684 52:47 well I guess like indeed like (.) yeah may be in you have some interaction you could
5685 have some uh ((noise)) yeah in principle you can have inter: interaction between the 2
5686 compounds so if it's different it could have in principle an effect it's possible (.)

5687 53:21 **and this is something that you do like very very often not an occasional practice**
5688 **not (.) most of the time**

5689 53:30 you mean to check the media?

5690 53:31 **no you don't check (.) only very rarely check but the use of the medium is**
5691 **something central in your**

5692 53:43 uhum

5693 53:44 **so if something is central but you don't know by heart but you use and now you**
5694 **know that it is it plays a a role in the research**

5695 53:52 well it's it's possible when I start I investigate what is in it so I don't know by heart but
5696 at that moment I know what is in it and I know it's good or not and afterwards yeah you just
5697 have to assume that the manufacture is doing a good job and producing the right product (.)
5698 but it can happen indeed that u:h after a while you discover oh there must be a problem in the
5699 medium and then you'd have to back (.) it happens but then you'll have to repeat a big part of
5700 res of your research it's possible

5701 54:30 **ok other researchers do like you do?**

5702 54:31 It happens yeah like that (.) I've heard of people who then they just got a problem in the
5703 medium and then they had to use a specific bunch of medium to perform all the experJoannet
5704 to make it all consistent and they're finding to see what was the problem

5705 54:51 **ok perfect thank you very much**

5706

5707 **BRIAN 21**

5708 51:48 **are there risks that if the medium components are not exactly as thy are described**
5709 **(.) they make cause the cells to develop resistance to drugs?**

5710 51:59 yes

5711 51:59 **or in protein expression?**

- 5712 52:02 yes
- 5713 52:03 **or what else?**
- 5714 52:03 yes if the components are not the same (.) it can change a lot (.) a lot
- 5715 52:12 **so how can you? ok they change a lot? and and at the same time you trust (.)**
- 5716 **because you trust the company that gives you**
- 5717 52:20 yes
- 5718 52:20 = **and that's what you use every day for every single experJoannet (.)**
- 5719 52:27 yes
- 5720 52:27 **how can you trust?**
- 5721 52:28 because you buy from companies that they have the quality control in the company is
- 5722 not like (.) yeah we prepare also our own home made medium (.) and it's much more variable
- 5723 I will say than the commercial one (.) so it's better the commercial one because the quality
- 5724 control is much higher (.) yeah we can depend on the () is working well (.) is well calibrated
- 5725 (.) in company (.) all these parameters are controlled very tightly and they have better
- 5726 machines (.) everything is u:h more constant
- 5727 53:09 **ok but (.) so you need to trust (.) you need to trust this company**
- 5728 53:12 you trust them because you know it's better (.) with experience you know that the
- 5729 normally the product from the the companies work well (.) work better than what's you make
- 5730 for example homemade (.) sometimes (.) well sometimes and most of the time because it's
- 5731 much more control (.) the quality control in this company is very tight
- 5732 53:36 **but in research don't you need to be at least once once suspectful about**
- 5733 **everything?**
- 5734 53:42 yes you test before doing (.) before changing the drum of the medium you test anyone
- 5735 and you already can see results are (.) look different or the if the results look different (.) it's

5736 important to test a new product before using it (.) we always test when (.) when we buy
5737 something new (.) we always test this stock
5738 54:09 **if you if you test a drug and it doesn't work**
5739 54:13 uhm
5740 54:13 **It doesn't work (.) you will not move to the mice? right?**
5741 54:18 no
5742 54:18 **and you will just leave this research you say that it did not it did not lead to**
5743 **anything and u:h you don't even publish it and you just leave it**
5744 54:28 yes you will try another one ((laughter))
5745 54:31 **but before trying another one don't you try to put your own medium and test it?**
5746 **at least for once in your life or in your career?**
5747 54:44 uh: no
5748 54:45 **no**
5749 54:45 I never do that
5750 54:51 **ok we're done with the medium.**
5751
5752 **DILARA 21**
5753 45:29 **D'accord ça tu parles des choses essentielles réellement essentielles il faut pas s'en**
5754 **passer (.) Are there risks that if the medium components are not exactly as they are**
5755 **described they may cause the cells to develop resistance to drugs or in protein**
5756 **expression for example?**
5757 45:49 (0.8) je réfléchis (0.9) peut être (.)
5758 46:06 **Donc s'il arrive**
5759 46:07 oui

5760 46:07 = **s'il arrive que ces milieux contiennent des molécules dont on est pas au courant**
5761 **on sait pas il y a des choses qui ne sont pas dans la fiche technique est ce qu'il y a les**
5762 **risque existe? et combien il est le risque que ça a à voir avec la résistance**
5763 **des cellules ou dans l'expression des protéines**
5764 46:36 (0.4) mais je réfléchis parce que en fait euh le milieu quand il est fait c'est euh il
5765 prennent un tube du composé A ils le vident dans la casserole ils prennent un tube du
5766 composé B ils vident dans leur casserole > ils prennent un autre de composé C ils vident
5767 dans la casserole il rajoutent de l'eau ils mélangent et puis voilà le milieu est fait < (.) et donc
5768 s'il y a des éléments en plus qu'on ne connaît pas (0.2) ben bfffhhh soit ils sont sous forme de
5769 traces ↑ donc c'est à dire en concentration infime et donc ça n'aura aucun impact sur les
5770 cellules (.) soit je vois pas d'où ça pourrait venir parce que je t'ai dit ils prennent 3 types ils les
5771 mélangent ils mettent de l'eau et puis voilà
5772 47:21 **qui prend ces 3 types?**
5773 47:23 Les fabricants du milieu
5774 47:24 **les fabricants? mais ces ces tubes sont sont ces des molécules**
5775 47:25 ↑ c'est des molécules mais ces molécules ont produites et puis après il y a
5776 un contrôle en fin il y a il y a un contrôle énorme un contrôle de qualité énorme en amont et
5777 en aval de la fabrication (.) et donc ss s'il y a une contamination par composé qu'on ne connaît
5778 pas (.) c'est en concentration infime c'est (.) pour moi elle proche du nul
5779 47:57 **Si on est maintenant cynique et on fin parce que là j'ai compris que tu t'es basé**
5780 **sur le fait qu'il faut faire confiance à ces industries puisqu'elles sont sérieuses c'est des**
5781 **firmes sérieuses qui c'est leur réputation et cetera (.) c'est ça la base on ne peut pas**
5782 **vérifier mais ces firmes sont sérieuses donc voilà maintenant si on essaye de réfléchir**
5783 **autrement d'une manière s'il y a une raison économique une raison quelconque est ce**
5784 **que ces firmes sot capables de faire ces tricheries on va appeler ça comme ça de de**

5785 **mettre des molécules tout le temps en sachant qu'on vent au monde entier ces milieux**
5786 **puisque les fabricants sont 3 (.) 4 (.) 5**

5787 48:51 ben j'aurai envie de dire non (.) mais la réponse est certainement oui parce qu'on a bien
5788 vu euh avec les lasagnes les gens mettent du cheval au lieu du porc et du bœuf donc euf oui
5789 on peut tomber sur un dirigeant un mal veillant qu'il le fera (.) moi j'ai envie de me dire que
5790 non ça n'arrivera pas (.) mais eh ça peut arriver

5791 49:19 **Si intérêt eh des chiffres astronomiques ah**

5792 49:26 oui oui (.) maintenant on n'est pas les seuls clients de ce genre de firmes et ces firmes
5793 comme je t'ai expliqué tout à l'heure vendent aussi aux firmes pharmaceutiques qui elles font
5794 énormément (.) de contrôle (.) et donc peut être que nous on sera grugé on va utiliser un
5795 milieu de culture falsifié (.) mais je pense que d'autres personnes vont dire eh delà
5796 le milieu que vous nous vendez n'est pas conforme à votre fiche technique

5797 49:52 **Mais comment ces firmes pharmaceutiques peuvent vérifier la molécule qu'ils ne**
5798 **connaissent pas**

5799 49:59 mais on fait il y a des appareils qui te permettent de quantifier des molécules (.)

5800 50:08 **Que tu connais**

5801 50:08 non pas forcément

5802 50:11 tu **peux savoir tout ce qui existe dans une solution?**

5803 50:14 En fait parfois tu vois que t'as une molécule (.) parce que c'est une grande colonne qui
5804 fait plusieurs mètres (.) et donc et donc tu injectes une échantillon dedans dans la molécule et
5805 on fait les molécules vont s'accrocher plus ou moins fort avec la colonne donc ces molécules
5806 les molécules vont être plus ou moins ralenties dans la colonne (.) tu vois en fonction de leurs
5807 caractéristiques et puis à la fin de la sor à la sortie (.) les molécules sont dosées avec des
5808 appareils euh électriques si tu veux (.) et à la fin qu'est ce que t'as t'as un graphe avec des
5809 pics comme ça (.) et on sait par expérience par exemple que le sucre ben il a une affinité x ou

5810 y et il sorts après douze minutes donc il reste douze minutes il lui faut douze minutes pour
5811 parcourir la colonne mais parfois il y a des molécules que tu connais pas du tout et donc tu
5812 vas avoir un pic par exemple après vingt minutes (.) ben tu sais pas ce que c'est mais t'as une
5813 molécule

5814 51:14 **de plus**

5815 51:14 = et donc on appelle ça (.) oui et donc on appelle ça une impureté ça veut dire que dans
5816 l'échantillon il y a une impureté on sait pas quelle molécule c'est (.) mais on sait qu'il y a une
5817 molécule parce qu'il y a un pic qui est sorti et donc après tu peux aller plus loin et faire des
5818 test tu vois pour connaître la structure de la molécule mais dans moins dans un premier temps
5819 tu peux dire et donc dans un échantillon comme ça tu peux dire tiens j'ai majoritairement 3
5820 composés tu vois si t'as trop grands pics j'ai 3 composés maintenant si t'as un composé que
5821 t'es pas sensé avoir (.) et que t'as un quatrième pic tu dis hop hop ah de là j'ai une impureté

5822 51:50 **Donc les les firmes pharmaceutiques peuvent vérifier donc ces industries ne**
5823 **peuvent pas tricher ces firmes là mais ils peuvent tricher ici (.) ils peuvent vendre un**
5824 **produit ici**

5825 52:03 oui certainement (.) oui elle pourraient (.) elles pourraient mais je ne pense pas que le
5826 milieu académique soit un client assez important pour euh enfin je ne pense pas qu'on soit
5827 intéressant pour

5828 52:16 **Ah oui? mais c'est quand même des milliers de laboratoires dans le monde et les**
5829 **et les industr fin les firmes qui vous vendent les milieux ne sont pas beaucoup dans le**
5830 **monde quand même 4 (.) 5 (.) 6**

5831 52:29 Mais peut être que je me trompe ah c'est un sentJoannet que j'ai moi j'ai l'impression
5832 que les firmes pharmaceutiques ont besoin de beaucoup de plus de (.) de milieux de
5833 composés chimiques et cetera pour faire des médicaments

- 5834 52:41 **ah oui oui peut importe fin par rapport je p je compare pas (.) mais le fait fin il y**
5835 **a beaucoup de laboratoires quand même c'est c'est de la consommation quand même (.)**
5836 **donc si on conclue ici c'est dire fin le risque il existe mais on sait pas le le vérifier à**
5837 **l'échelle de académique il est vérifiable à l'échelle des pharmacies en fin des firmes**
5838 **pharmaceutiques**
- 5839 53:04 Il est peut être plus facilement vérifiables oui
- 5840 53:08 **mais si il y a des tricheries ça peut être énorme comme euh ça peut être très grave**
5841 **pour la**
- 5842 53:13 mais dans (.) moi dans mon imagination je ne peux pas pas imaginer quelque chose de
5843 très grave (.) mais s'il on sort du milieu pharmaceutique et scientifiques en général t'as
5844 l'exemple du cheval dans les lasagnes t'as l'exemple chez VW avec les voitures où ils mettent
5845 un logiciel donc hh c'est quelque chose si on me l'avais dit il y a six mois que qu'on peut
5846 mettre un logiciel pour euh pour frauder sur la pollution je dis mais non mais non personne ne
5847 va faire ça
- 5848 53:39 **Pourquoi?**
- 5849 53:41 Parce que on est on croit dans les gens on leur fait confiance
- 5850 53:46 **on donc c'est b donc ton avis c'est basé sur cette confiance**
- 5851 53:48 oui oui
- 5852 53:49 **C'est pas un avis par exemple qui est basé scientifiquement vérifiable quelque**
5853 **chose c'est parce que tu as envie de faire confiance à**
- 5854 53:58 oui parce qu'on a pas les moyens de vérifier (.) si on avait les moyens de vérifier ben
5855 voilà je l'ai de fait (.) j'ai un dosage j'ai les résultats mais ici oui il faut se baser sur la
5856 confiance
- 5857 54:14 **et donc si si il se passe quelque chose comme tu disais en fin tu disais le cheval le**
5858 **truc de cheval**

- 5859 54:20 oui (.) t'as pas entendu cette histoire?
- 5860 54:21 **non j'ai entendu**
- 5861 54:24 ((laughter))
- 5862 54:24 **mais c'était c'était plutôt la viande du cheval dans le jambon de**
- 5863 54:29 la viande de cheval dans la lasagne
- 5864 54:29 **voilà oui**
- 5865 54:32 oui
- 5866 54:32 **et donc s'il se passe quelque chose de de cet ordre là au niveau en parlant**
- 5867 **maintenant des molécules dans les qu'on connaît pas dans les (.) c'est c'est grave pour la**
- 5868 **recherche?**
- 5869 54:42 C'est grave oui et non (.) si la molécule n'a pas d'impact sur la protéine qu'on étudie
- 5870 (.) c'est pas grave
- 5871 54:52 **si elle a un impact c'est à dire si elle est là pour euh**
- 5872 54:57 influencer le résultat
- 5873 54:58 **la résistance surtout**
- 5874 54:59 oui
- 5875 54:59 **la résistance et donc ça peut?**
- 5876 55:03 ça peut oui (.) mais maintenant il y a des millions de molécules des molécules qui n'ont
- 5877 aucun impact
- 5878 55:09 **euh**
- 5879 55:09 le plastique de tes de tes ta boîte de culture elle est faite en fin il y a des molécules aussi
- 5880 là dedans
- 5881 55:15 **aussi oui**
- 5882 55:15 et pourtant ça n'a pas d'impact
- 5883 55:19 **Comment tu le sais? elle n'a pas d'impact?**

- 5884 55:21 ben en le disant je me suis dit mince c'est pas le bon exemple parce que
- 5885 55:24 ((laughter)) **ça peut être**
- 5886 55:24 c'est aussi on étudie la composition du plastique de la surface du plastique et on fait en
- 5887 fonction des marques la composition est différente le plastique est différent
- 5888 55:35 **aussi**
- 5889 55:36 oui et ça a un énorme impact fin du moins sur les cellules que j'utilisais ça avait un
- 5890 énorme impact par ce que justement on utilisais des boites et puis euh il y a un moment où les
- 5891 cellules ne restaient plus accrochées dans le fond
- 5892 55:49 **ah**
- 5893 55:50 elles se décollaient (.) et on ne comprenaient pas pourquoi parce que nous on avait rien
- 5894 changé et eux ils avaient changé parce que le plastique dans le fond subit un traitement (.) et
- 5895 donc on a fait une étude de surface de la surface du fond des boites euh de différentes
- 5896 marques (.) et on a vu qu'en effet il y avait
- 5897 56:09 **et il a fallut que et il a fallu avoir cet incident là pour comprendre que fin**
- 5898 56:12 oui
- 5899 56:15 **donc avant ça vous vous êtes jamais douté de du fait que**
- 5900 56:17 non parce que c'est eux qui ont changé leur façon de produire les boites (.) et en général
- 5901 pour d'autres il y a d'autres personnes
- 5902 56:25 **ils ont changé sans prévenir ?**
- 5903 56:27 oui (.) oui
- 5904 56:30 **et donc au niveau académique ou de recherche ici (.) il faut il faut qu'il arrive un**
- 5905 **incident pour se poser la question? comme tu disais l'autre jour tant que ça marche ça**
- 5906 **va**
- 5907 56:42 oui et en même temps sur 99% des cas ce changement n'avait pas d'impact
- 5908 56:49 **aussi**

5909 56:50 y a qu'un impact donc finalement que ce soit le premier traitement ou le deuxième
5910 traitement euh le plastique avait des propriétés suffisantes pour les autres cultures

5911 56:59 **ah**

5912 56:58 mais pour nous c'était pas euh c'était pas suffisant et du coup ça ne fonctionnait plus

5913 57:03 **trés bien ((laughter)) ben ça**

5914 57:11 en parlant de tout ça moi j'en ai déjà eu des problèmes dans mes recherches

5915

5916 **GAELE 21**

5917 36:56 **ok (.) ok now last question are there risks that if the medium components are not**
5918 **exactly as they are described they may cause the cells to develop resistance to drugs or**
5919 **in protein expression or what else**

5920 37:14 yes (.) it could make change u:h they () in:: for it could the sells can express different
5921 protein they can down regulate or upper regulate some proteins or not they can:: adapt and so
5922 not be like in the real condition

5923 37:51 **perfect thank you very much ((laughter)) moi je peux continuer si tu as le temps**

5924 37:59 non mais moi je vais aller

5925 **PAUL 21**

5926 23:46 **If (.) are there risks that if the medium components are not exactly as they are**
5927 **described they may cause the cells to develop resistance to drugs or in protein**
5928 **expression for example? or what other risks that you think can be possible? if the exact**
5929 **composition of the of the medium is not known**

5930 24:17 (0.6) if the exact composition of the medium is not known u:h cells can simply
5931 proliferate u:h quicker or slower if there are minor change there is one thing lacking u:h the
5932 cells specifically the tumor cells they can adapt to such a situation and u:h what is more and

5933 more known is the plasticity of cells and tumor plasticity is such that u:h they can
5934 accommodate u:h many different stress conditions what an healthy cells cannot necessarily
5935 do a:h so (.) the cells can adapt and you may work on something which is due to u:h uh an
5936 adaptation not wished but an adaptation which to some problem in the medium you use so if
5937 the medium was not the is not the expected one (.) you could think that what you observe is
5938 due to the kind of tumor cells you use or the treatment you have added on the cells but it
5939 could be really due to something else which could be the lack of one amino acids because the
5940 company u:h would which offer which did produce the medium forget one step in the process
5941 but we cannot control everything clearly

5942 25:54 **but I mean the mean as it is u:h commonly shared (.) it's something that is used**
5943 **everywhere in all labs in the world f it turns out to be not exactly as it should be or**
5944 **maybe there is particularly that it is produced you know by a couple or number of firms**
5945 **that provide to all labs in the world right? may a limited number (.) so if it turns out**
5946 **this should not be the right medium I mean in terms of the molecules it could contain**
5947 **that you cannot detect what kind of danger that would**

5948 26:38 if the control of your experJoannets which is that other labs can reproduce your
5949 experJoannets and your results (.) if everybody is making the same mistake then you may
5950 certainly misinterpret the data and if you work on the drug development you can find a drug
5951 which is active artificially but which not which will not relieve patients because your model
5952 is too far from the reality ah if you push that at the extreme you could think about that

5953 27:24 **ok thank you very much we're done with ((end of recording))**

5954

5955 **DALILA 21**

5956 27:30 **d'accord (.) last question are there risks that if the medium components**

5957 27:39 oui

- 5958 27:39 = **are not exactly as they are described**
- 5959 27:43 oui
- 5960 27:42 = **they may cause the cells to develop resistance to drugs**
- 5961 27:47 oui
- 5962 27:46 = **or in protein expression or else?**
- 5963 27:51 oui
- 5964 27:51 **il y a le risque**
- 5965 27:54 oui (.) ça c'est aux firmes ont intérêt à ce regardent qu'ils préparent aussi
- 5966 28:00 **après**
- 5967 28:01 ↓ on un certificat parfois on reçoit les certificats de conformité machin comme ça si
- 5968 jamais après c'est comme partout on teste cinq six trucs qu'on sait qu'ils peu qu'ils sont
- 5969 déterminants à la culture cellulaire mais (0.3) j'étais jamais voir comment ils préparent les
- 5970 milieux donc je ne sais pas
- 5971 28:30 **d'accord ok thank you very much**
- 5972 28:30 voilà ↑
- 5973
- 5974 **JOANNE 21**
- 5975 38:51 uhm (.) **ok are there risks that the medium components are not exactly as they**
- 5976 **are described? they may cause the cells to develop resistance to drugs? or in protein**
- 5977 **expression?**
- 5978 39:17 (0.4) may be (.) you mean the medium what we are using they are affecting the cells?
- 5979 (0.4) I don't know (.) may be because if you exposure the cells (.) most of the time or some
- 5980 time of nutrients and u:h there is other nutrients they are negl neglected (.) so like for
- 5981 example the receptors or receptors of the s nutrients they won't work as well as the normal
- 5982 40:04 **what are the consequences on the research?**

- 5983 40:08 may be they will u:h have a: they will not the same like some (.) some pathways will
- 5984 not work u:h exactly the same as other real cells (.3)
- 5985 40:31 **ok thank you very much (.)**
- 5986 40:34 You're welcome

C2. Collective interview (case 2)

5987 32:06 **so why are the cells constantly in the medium and not exposed to it like humans**
5988 **take nutrients? Like humans eat and drink from time to time (.) but we see these cells**
5989 **like all the time u:h exposed to the medium like in a constant way [**
5990 32:23 ((Brian)) [it's the same[
5991 32:24 ((Gaelle)) yes ((laughter))
5992 32:25 **same what?**
5993 32:26 ((Brian)) same principal
5994 32:27 **Ah you think it's like like humans? You think**
5995 32:30 ((Brian)) no no it's like the co2 ((referring to his answer about the co2 of the previous
5996 interview)) you need to find like a condition to work
5997 32:36 **ok**
5998 32:36 ((Brian)) and they work well with this uh (.) this like a stable condition also to have the
5999 cells in the medium (.) and you can develop of course like u:h (.) a sponge or there are
6000 already[
6001 32:48 ((Daniel)) [there are some labs developing kind of pump (.) actually the: the medium is
6002 u:h in a cycle[
6003 32:58 ((Brian)) [but is very expensive [
6004 32:59 ((Stephan)) it's expensive it's a practical question (.) and practicality [
6005 33:02 ((Brian)) it's practically it's the same[
6006 33:03 ((Gaelle)) [yes because we have to put it inside the incubator [
6007 33:07 ((Brian)) [develop a new mec ((hh)) new plates new () (.) it's easy to: contaminate (.)
6008 to (.) you probably you need to need to trash everything it's expensive because you need it (.)
6009 daily almost to split your cells and so on (.) so you have this kind of system you'll have

6010 probably to trash some part that are expensive to make and it will be (.) very expensive (.)
6011 also (.) but we agree maybe it's better with uh pumping your medium ((laughter))
6012 33:43 **ok now do do do they consume all the time? do they take nutrients from the time**
6013 **or only when they need? They are like constantly round the clock consuming**
6014 33:57 ((Brian)) Yeah
6015 33:57 ((Stephan)) As long as [
6016 33:59 ((Daniel)) [All the time they need u:h[
6017 33:59 ((Brian)) yeah not [
6018 34:00 ((Daniel)) = energetic fuels u:h nutrients (.) it's not u:h one time they need they stop
6019 then one hour later they: they take () it's constant
6020 34:16 **they constantly take ok**
6021 34:18 ((Gaelle)) it's like human body (.) you're not like [
6022 34:22 ((Daniel)) [Yeah it's u:h[
6023 34:23 **it's like the human body?**
6024 34:25 ((Gaelle)) uhuh
6025 34:26 **the bood (.) in the blood? The blood is supplying our body with nutrients all the**
6026 **time or when we need?**
6027 34:32 ((Gaelle)) all the time
6028 34:33 **so the blood is constantly giving the cells in our body**
6029 34:37 ((Gaelle)) but it will take[
6030 34:38 ((Daniel)) → [I think it's not only in the blood it's also: the cell contact or
6031 communication
6032 34:46 **action potential (.) or is that what you call it?**
6033 34:49 ((Daniel)) no it's actually it's some cells are producing:: a compound and other cells
6034 can use this compound to:: to use it as () fuel (.) there is a communication between the cells

6035 35:03 ((Gaelle)) like from: [
6036 35:03 ((Daniel)) it's not only coming from the blood
6037 35:05 ((Brian)) () [
6038 35:06 ((Gaelle)) yeah if you have like u:h you à jeun ((in French it translates: to be fasting))
6039 like uh [
6040 35:14 ((Daniel)) yeah like calorie restriction or:
6041 35:16 ((Gaelle)) they (.) the person they will take from fat
6042 35:19 **yes**
6043 35:20 ((Gaelle)) and do like u:h other nutrients that the cells need it's like uh (.) there are
6044 storage[
6045 35:25 ((Stephan)) there is storage (.) cells that store energy that release it more than they
6046 would in in uh take up
6047 35:34 **You're taking about the cells in the body or?**
6048 35:35 ((Gaelle)) in the body
6049 35:37 **so the cells in the body do not consume all the time or all the time they consume?**
6050 **They constantly take from either the blood or from the storage?**
6051 35:46 ((Stephan)) except from some exceptions the cells they indeed consume all the time
6052 35:53 ((Daniel)) all the time yeah
6053 35:53 ((Stephan)) unless you have the cell that is ending it's storage like fat
6054 35:57 **and so and so both the cells that you work on and in the body they consume all the**
6055 **time**
6056 36:02 ((Stephan)) Yeah
6057 36:02 ((Gaelle)) uhum
6058 36:03 ((Daniel)) uhm

6059 36:04 **ok (.) and if you expose the (.) the cells to the medium (.) you assume that they are**
6060 **able to take from the medium like u::h using pathways (.) or is it accessible because it's**
6061 **just on it ? so because the medium is on the cells so the cells are able to take like the:**
6062 36:26 ((Gaelle)) because there are transporters sensors so they can: take the nutrients
6063 36:30 **ok**
6064 36:32 ((Brian)) and the ones that there are not in the medium they can produce themselves so
6065 (.) with the things that are in the medium (.) this is hhh ((laughter))
6066 36:41 **ok but now with regard to concentrations in the medium now? which is more**
6067 **constant (.) is it the body that is more constant in the way that it feeds the cells or the**
6068 **medium is more constant? and do we need to have these constant levels?**
6069 37:01 ((Gaelle)) it's more constant if like uh if your cells during one week they will have no
6070 glucose [
6071 37:07 ((Daniel)) Yeah it's
6072 37:09 ((Gaelle)) the nutrients in the the dish (.) in human body your brain say ok now I need
6073 like sugar and you will eat to have enough sugar (.)
6074 37:20 **ok so it means that the body is more constant? the cells in the body**
6075 37:24 ((Gaelle)) Yes but[
6076 37:24 ((Stephan)) it's better controlled yeah it has automatic feedback and in culture the
6077 culture itself is not screaming like I'm hungry feed me so[
6078 37:32 ((Gaelle)) yes (.) that's why we change also the medium like every two two[
6079 37:37 ((Stephan)) two three days[
6080 37:37 ((Gaelle)) = three days
6081 37:39 **so the cells that on which you work are not consuming in a constant way like we**
6082 **do in the body?**
6083 37:46 ((Stephan)) they are[

6084 37:49 **they are (.) when it it drops like the levels drop or for example**

6085 37:54 ((Brian)) no they consume less they grow less and you have to: yeah[

6086 37:58 ((Stephan)) they become less happy but that's why you have to [

6087 38:00 ((Brian)) to change the medium

6088 38:00 ((Stephan)) = culture in appropriate manner to prevent them from starving ((laughter))

6089 38:06 ((Brian)) Yeah

6090 38:08 **ok what about the gases that are u:h let out in the medium and is kept there (.)**

6091 **like for example the body gets the gases outside the body right? but in your dish they're**

6092 **constantly there (.) what what kind of u:h [**

6093 38:28 ((Daniel)) no for the gas in the flask you have a membrane and the gas can u:h diffuse

6094 (.) they're not [

6095 38:36 ((Stephan)) it's not air tight

6096 38:38 ((Brian)) it re it renews gas exchange

6097 38:41 **ok if this way of exposing the medium to the cells is satisfactory (.) why trying (.)**

6098 **the flow system makes the medium flow like (.) then be permanently there? Why some**

6099 **people want to try this? This flow system instead of just exposing [**

6100 39:01 ((Gaelle)) [to be more close than to physiological u:h yeah stuff

6101 39:05 ((Brian)) exactly

6102 39:07 ((Daniel)) it's kind uh small dynamic system it's not only glucose is always in the flask

6103 (.) glucose is circulating and u:h so cells can get access sometimes[

6104 39:19 ((Gaelle)) [like blood vessels

6105 39:19 **what kind benefit this can have? Why is this important?**

6106 39:26 ((Stephan)) maybe the cells can produce something that is inhibiting their own growth

6107 and if you don't remove it they will change their behavior

6108 39:34 **No but I (.) in what sense on what sense (.) because you said already (.) said that**
6109 **u:h it's ok we're satisfied with this condition**

6110 39:41 ((Stephan)) for us yeah

6111 39:42 **((laughter))**

6112 39:43 ((Stephan)) that's our choice (.) but there are people they have other cells with other
6113 requirements and may be ah if they grow in a bottle it won't work (.) they will to (.) have this
6114 flow system

6115 39:58 **like what for example you said**

6116 40:01 ((Stephan)) I don't remember the cell type especially but I remember I've seeing people
6117 uh they did to (.) because the cells were reproducing something and they had to remove it (.)
6118 continuously so yeah (.) it depends (.) it depends on your uh (.) cells that you're studying

6119 40:16 ((Gaelle)) but some time it's the opposite (.) the cells are producing something that are
6120 needed for the growth [

6121 40:24 ((Stephan)) [that's also possible

6122 40:25 **which means you need to keep the cells (.) the**

6123 40:28 ((Gaelle)) the cells like for example two or three days (.) to: see the cells producing like
6124 u:h different factors that are needed for their whole growth

6125 40:37 ((Brian)) Yeah I don't think the pumping will be better than the other (.) you'll have
6126 also limitations

6127 40:44 **For both there are limitations**

6128 40:46 ((Daniel, Stephan and Brian)) Yeah Yeah uhm

6129 40:47 ((Brian)) because this is not like in the body you have some cells that they're producing
6130 an order that goes to the brain and the brain who send (.) send to these cells another signal to
6131 produce more of these and (.) or to flow flow or blood flow or whatever so it's

6132 41:05 **do you think that this question that I'm raising regarding the medium use**
6133 **constant flowing or whatever how does it (.) is it like the human body or not (.) is it an**
6134 **important question?**

6135 41:18 ((Gaelle)) uhm

6136 41:18 ((Brian)) Yes all (.) all these questions are important

6137 41:22 **because like (.) Paul was the only one who said I keep asking in every**
6138 **experJoannet I keep asking students whether PhD students or any research (.) are you**
6139 **sure of what you're doing in your in your medium what you put there and you this**
6140 **exactly (.) he was like extremely u:h cautious about the use of the medium (.) whereas**
6141 **reactions I got from all of you is that ok it's important but we have other more**
6142 **important things (.) so we don't have time for that (.) it's important but we're really**
6143 **busy with other things**

6144 42:06 ((Gaelle)) no because for me for example I'm playing with the:: different nutrients in
6145 the medium so

6146 42:11 **ah ((laughter))**

6147 42:11 ((Daniel)) Yeah all of us are working on metabolism of cells (.) and the metabolism is
6148 different depending on the source of such and the composition of medium so[

6149 42:23 ((Brian)) [and Oxygen

6150 42:24 **this is because this lab is specialized in metabolism right?**

6151 42:27 ((Gaelle)) Yeah

6152 42:27 **u::h**

6153 42:31 ((Gaelle)) but it's true like for example when I was in conference and I was showing
6154 results in poster they said ok we (.) we did not think about that u:h the concentration for
6155 example of vitamins was important for the cells (.) but that's why you're going also in

6156 conference and you're sharing your experJoannet with other (.) and you're reading the paper
6157 on pub med for example to see: what can change and (.)
6158 42:59 **Now you (.) can the permanent exposure to the medium cause a negative outcome**
6159 **to the research? (.) The way that you're doing right now?**
6160 43:10 ((Daniel)) Yeah we could miss u:h adaptive process uh the cells need to use in terms of
6161 (.) if they lack u::h the substrate or something they will adapt to find another way to
6162 proliferate (.) and because we're changing the medium every two three days (.) they've full
6163 access to: to the substrate or (.) they will not need to adapt to the lack of u:h [
6164 43:42 ((Brian)) it's like the co2 it could be[
6165 43:45 ((Daniel)) [= Yeah it's a limitation of in vitro conditions
6166 43:53 **Do you agree? ((everyone laughing)) ok now if cancer is caused by some molecule**
6167 **so if it's molecular (.) do you think that the molecule once it affects the cell it is no longer**
6168 **there? So if the cells are cancerous it means that they are proliferating in an abnormal**
6169 **way (.) this condition is cancer right? The fact that cells proliferate in an abnormal**
6170 **way?**
6171 44:24 ((Gaelle)) Uhum
6172 44:24 **but how can we be sure that the molecule (.) if you are sure (.) that the molecule or**
6173 **form that caused this cancer is no longer in the cell?**
6174 44:38 ((Gaelle)) I don't understand
6175 44:39 ((Stephan)) It depends on your molecule you can be sure (.) you can induce cancer with
6176 UV radiations turn off the light and you can still have cancer [
6177 44:47 ((Brian)) [Yeah Yes (.) you don't need a molecule
6178 44:49 ((Stephan)) you know it's not there (.) so (.) even this it's a reaction to
6179 44:53 ((Brian)) or you (.) it's a mutation in your cells
6180 44:58 **((talking to Gaelle)) did you get my point?**

6181 44:58 ((Gaelle)) no ((laughter))

6182 44:59 **if cancer is caused by a molecule or any form**

6183 45:01 ((Gaelle)) yes

6184 45:03 **so there is molecule like for example tobacco or that cause**

6185 45:06 ((Gaelle)) uhum

6186 45:06 **I felt that you assume that ok (.) cells are now proliferating so they are cancerous**

6187 **because of this molecule but the molecule is no longer there**

6188 45:17 ((Gaelle)) yes but the caused damage to the cells

6189 45:20 ((Brian)) Yeah

6190 45:20 ((Gaelle)) = and the damage are still there

6191 45:21 **Why assume it's just the damage but there no (.) inside the cells u:h**

6192 45:28 ((Stephan)) but if they proliferate they are spreading you're diluting them out (.)

6193 diluting more and if you still have such a diluted cell that's still cancerous it's [

6194 45:37 ((Brian)) [the molecule [

6195 45:39 ((Stephan)) = like dilution (.) they know it cannot be effective (.) in this sense so this

6196 molecule is theoretically you can dilute your cells as much as possible that you are below one

6197 particle of the molecule per: culture so (.) and if the culture cell respond the same and they're

6198 still cancerous (.) you know the molecule is not in all of them and if they're all cancerous then

6199 it's even without the molecule being present

6200 46:12 **I know that they can be cancerous cancerous without the molecule being present**

6201 **that's possible**

6202 46:17 ((Gaelle)) uhum

6203 46:17 **but how do you know that it's not there? It just affects the cells and goes away**

6204 46:27 ((Brian)) which molecule? chemical?

6205 46:28 ((Daniel)) Yeah it depends which one

6206 46:30 **a chemical yeah a form**

6207 46:34 ((Brian)) you have the chemical then you remove the chemical then the cells divide and

6208 you always keep the cells without these chemical in different models in different

6209 46:43 ((Daniel)) [if you want to be really sure you can dose the chemical in your cells (.) if

6210 you want to get sure that

6211 46:52 ((Brian)) you can label your

6212 46:52 ((Daniel and Brian speaking at the same time. Inaudible))

6213 46:52 **if you know the chemical (.) if you know it**

6214 46:53 ((Stephan)) Yeah

6215 46:54 **but if you don't know it (.) if there is you have like cells that are cancerous (.) you**

6216 **don't know the cause (.) may be it's molecular may there is**

6217 47:03 ((Daniell)) Yeah

6218 47:06 ((Brian)) this is different

6219 47:04 ((All speaking at the same time. Inaudible)) ((laughter))

6220 47:05 ((Brian)) because may be something that they produce (.)

6221 47:10 ((Daniell)) so so will see only the damage (.) but probably yeah the cause is still still

6222 there[

6223 47:16 ((Gaelle)) but for some cancer there are still looking for::: cause the reason

6224 47:23 **Yes (.) no I mean if you agree that cancer can be caused by molecules**

6225 47:30 ((Daniel)) Uhum

6226 47:31 **and now you're observing your cancer cells you're saying ok these are abnormal**

6227 **because they are proliferating is it possible that the molecule that cause this**

6228 **proliferation is always there?**

6229 47:44 → ((Stephan)) could be

- 6230 47:45 ((Daniel)) → Yes but if we think about (.) the cancer would be caused by a molecule (.)
- 6231 you need to think about which molecule (.) you're talking about
- 6232 47:55 ((Stephan)) if for example
- 6233 47:56 ((Daniel)) ↑ For your hypothesis you need to think ok this molecule and you know
- 6234 which one would cause cancer (.) and then you will you will track it (.) it could be
- 6235 48:06 ((Stephan)) it could be a mutation [
- 6236 48:07 ((Daniel)) although it's[
- 6237 48:07 ((Stephan)) → [= your cell producing its own molecule that is causing the cancer (.)
- 6238 could be (.) and it's always present indeed
- 6239 48:15 **so do you agree that cancer can be caused by a molecule?**
- 6240 48:19 ((Gaelle)) Yes
- 6241 48:19 ((Daniel)) → Yeah because it's already described by (.) some molecules we know
- 6242 48:23 **((Addressing the question to Daniel)) so some molecules can cause cancer?**
- 6243 48:25 ((Daniel)) Yeah
- 6244 48:25 ((Gaelle)) yes
- 6245 48:27 ((Daniel)) some chemicals
- 6246 **48:28 ((speaking to Daniel)) because may be I misinterpreted your what you said before**
- 6247 **u::h that it (.) I thought you told me that it's never possible (.) I thought**
- 6248 48:36 ((Daniel)) → no no no
- 6249 48:35 **it's possible that**
- 6250 48:37 ((Daniel)) It's possible
- 6251 48:39 **It's possible?**
- 6252 48:39 ((Gaelle)) yeah
- 6253 48:40 **so cells can be (.) become cancerous because they are exposed to some molecules?**
- 6254 48:44 ((Daniel)) → Yeah for sure

6255 48:44 **ok (.) now if in this case (.) but we still don't know which which molecule (.) is it**
6256 **possible that what we observe the cells that we observe still retain the molecule (.) you**
6257 **think that it's only a state of being proliferating but there is actually physically**
6258 **biologically the molecule is still there?**

6259 49:05 ((Stephan)) Yes still there yeah yeah it's still be there yeah

6260 49:07 ((Brian)) Yeah it's possible (0.3) because they they produce (.) there are some cells that
6261 produce these molecules to keep on proliferating

6262 49:17 **so they themselves reproduce the molecule?**

6263 49:19 ((Stephan)) Yeah

6264 49:20 ((Daniel and Brian)) Yes

6265 49:20 ((Brian)) they produce a protein or they produce u:h metabolite that is creating this
6266 effect

6267 49:26 **so it's not only about proliferating it's reproducing the molecule that is causing**
6268 **cancer?**

6269 49:33 ((Brian)) Because you have many different types of cancer

6270 49:36 ((Stephan)) if you're defining and your (.) they're producing () [
6271 49:39 ((Brian)) [there are some (.) there are some cells that they grow but they are not
6272 recognized by the immune system and this way they proliferate also (.) there are plenty of
6273 mechanisms

6274 49:50 **ok in this case now (.) we're talking about this particular case (.) where cancer is**
6275 **caused by a molecule (.) wouldn't that molecule stay in the medium get multiplied there**
6276 **and contaminate the others that may be cured when you test your drugs? For example**
6277 **this auto-contamination or resistance**

6278 50:08 ((Stephan)) → Yeah sure

6279 50:09 ((Brian)) → Yes

6280 50:11 **it's possible?**

6281 50:13 ((Daniel)) → yes

6282 50:14 **you agree ((talking to Daniel))?**

6283 50:14 yeah yeah

6284 50:15 **and you ((talking to Brian))?**

6285 50:18 yeah

6286 50:15 **((talking to Gaelle)) how about you?**

6287 50:16 ((Gaelle)) Yeah

6288 50:17 **are you sure?**

6289 50:19 **((Gaelle)) that auto-contamination is possible**

6290 50:23 ((Stephan)) → you can take you can take the medium of the cells of the culture without

6291 any of (.) uh with cancer without any cells left put in in another culture (.) there is a

6292 possibility that you induce cancer

6293 50:35 **so from this we deduce that there is something biological physical that is**

6294 **contaminating the cells**

6295 50:41 ((Stephan)) → could be

6296 50:41 **it's not just the state that the (.) how they function**

6297 50:48 ((Brian)) no no it's already described

6298 50:49 ((Stephan)) it's possible

6299 50:50 **because (.) to be honest with you (.) most of you said no except Stephan (.) the only**

6300 **one who said yes the other time (.) that this is possible was Stephan**

6301 50:59 ((Brian)) but if you ask a molecule (.) a chemical (.) it's not true

6302 51:04 **so. (.) say it again**

6303 51:05 ((Brian)) if it's a chemical it's not true (.) well everything is chemical (.) if it's a chemic

6304 chemic:::al product

- 6305 51:13 ((Daniel)) it depends on the molecule
- 6306 51:16 ((Brian)) the question is you add something to the cells and the cells will generate this
- 6307 again and I say no
- 6308 51:24 **yeah but at least it's possible (.) I mean if there is a molecule that's there**
- 6309 **contamination is possible?**
- 6310 51:30 ((Gaelle)) but if the molecule which is produced by the cell
- 6311 51:33 ((Daniel)) Yeah
- 6312 51:34 ((Gaelle)) not produced
- 6313 51:35 ((Daniel)) not an external compound
- 6314 51:37 ((Gaelle)) because it's the product that you put by yourself in the medium like I don't
- 6315 know which compound it will be diluted
- 6316 51:45 ((Stephan)) → Yeah then maybe you could have the effect that you put something in
- 6317 medium (.) the cells will respond they're responding by (.) producing something that induces
- 6318 cancer and that is responsible
- 6319 51:54 ((Gaelle)) yes but
- 6320 51:55 **exactly that's what I'm saying ((referring to Stephan's idea))**
- 6321 51:57 ((Gaelle)) yes but that's not the: (.) product that you put in the medium that cause that
- 6322 (.) it's the cells
- 6323 52:02 ((cyill)) it's not
- 6324 52:03 ((Stephan)) well it's a carcinogenic response
- 6325 52:05 ((Daniel)) it's not the same molecule
- 6326 52:06 ((Stephan)) it's just a () yeah it's not the same molecule
- 6327 52:09 **it's a molecule that is constantly there?**
- 6328 52:12 ((Brian)) but it's another one
- 6329 52:13 ((Daniel)) yeah but it's not the first one

- 6330 52:16 **I'm not talking about a particular molecule (.) did I name a molecule? I did not (.)**
- 6331 **but there is a molecule that is there and that is constantly**
- 6332 52:23 ((Daniel)) no but
- 6333 52:23 ((Brian)) no but it's on the question (.) if the is the there is something that the cell can
- 6334 produce and () yeah for sure (.) there are plenty of factors
- 6335 52:36 ((Daniel)) yeah it grows very fast
- 6336 52:41 **ok do you trust that the providers from which you buy the medium is giving you**
- 6337 **the medium that you want?**
- 6338 52:48 ((Gaelle)) Yes
- 6339 52:48 ((Daniel)) we we need to to trust
- 6340 52:50 ((Stephan)) in general yeah (.) but sometimes if something is wrong
- 6341 52:52 ((Gaelle)) ((laughter))
- 6342 52:52 ((Stephan)) ((laughing))
- 6343 52:56 ((Brian)) Yeah it's trustable (.) yeah
- 6344 52:57 ((Stephan)) normally yeah
- 6345 52:58 ((Daniel)) we need to (.) it's uh
- 6346 53:00 ((Gaelle)) we have quality control u:h
- 6347 53:02 ((Brian)) they have quality control that we don't have
- 6348 53:03 **who does the quality control?**
- 6349 53:05 ((Brian)) companies
- 6350 53:06 **they do it**
- 6351 53:06 ((Brian)) yes
- 6352 53:07 **but they are the judge and the judged as we say juge et partie ((in French))**
- 6353 53:11 ((Gaelle)) yes but there are also there are also consulting uh
- 6354 53:13 ((Daniel)) no no

6355 53:16 ((Gaelle)) = and they are also controlled by other like federation MDA and so on
6356 53:21 ((Daniel)) otherwise it will be too easy to cheat
6357 53:21 ((Brian)) change
6358 53:26 ((Gaelle)) and why what is the interest of the company to:
6359 53:31 **I will come to this in my next question**
6360 53:36 ((Stephan)) ((saying inaudible thing and everyone laughing))
6361 53:41 **let's say (.) when I say do you trust (.) what do you think about actually? You**
6362 **trust what in particular? What is the thing that you want to make sure that it's it's the**
6363 **thing (.) that's well done? (0.2) When I say Trust? You trust on what in particular?**
6364 53:57 ((Stephan)) Yeah
6365 53:57 ((Brian)) yeah but the first thing (.) When you prepare here the medium (.) you just
6366 check the pH in one pH meter that (.) is not the best (.) the more: accurate (.) and there they
6367 probably check (.) in different pH meters there is different people whatever (.) it's more
6368 control
6369 54:18 **ok so you're talking about the parameters that you already know? They check**
6370 **they are more professional more exact**
6371 54:24 ((Brian)) better equipment
6372 54:24 **Better equipment (.) More controls and everything about things that you worry**
6373 **about in your everyday like things that are known (.) structured right?**
6374 54:34 ((Brian)) Yeah
6375 54:34 **but what other other things that can be there in the medium[**
6376 54:38 ((Brian)) [but in medium (.) you have amino acids vitamins
6377 54:40 everything (.) you have a list

6378 54:41 ((Gaelle)) = you have a list of every compound inside (.) and sometimes there are also
6379 like they are sterilized so they made like a test to see that there is no toxin and so on in the
6380 medium
6381 54:54 ((Brian)) I I we prepare also the medium (.) here in the lab (.) but I prefer to buy the
6382 medium (.) it's more stable
6383 55:02 **Yeah you're talking about a particular point of view (.) about something that you**
6384 **want to have like exact amounts of the different ingredients (.) but suppose that the**
6385 **provider is altering the medium composition so some commercial purposes like for**
6386 **example to make your cells (.) addicted to their medium**
6387 55:25 ((Daniel)) hhhh
6388 55:25 **and if you use other medium (.) your cells will die**
6389 55:28 ((Daniel)) No I don't think
6390 55:29 ((Gaelle)) No because (.) you can use several (.) medium
6391 55:31 ((Brian)) companies
6392 55:31 ((Gaelle)) For example (.) there are like standardized medium ((naming the medium
6393 providers)) and they all have the same composition
6394 55:41 ((Brian)) composition yeah
6395 55:42 ((Gaelle)) and you can buy it from different companies and you'll have the same
6396 medium
6397 55:45 **How many companies there are in the world that are distributing all over the**
6398 **world?**
6399 55:49 ((Brian)) a lot ((laughing))
6400 55:50 ((Daniel)) yeah a lot
6401 55:52 **Are there no companies that are monopolizing the:**
6402 55:56 ((Gaelle)) like

- 6403 55:57 ((Stephan)) Yeah there some (.) like the biggest players (.) yeah you have
- 6404 56:01 **which one?**
- 6405 56:02 ((Gaelle)) ((naming medium providers))
- 6406 56:02 ((Stephan)) ((naming medium providers))
- 6407 56:04 ((Brian)) naming medium providers))
- 6408 56:05 **((company name)) there is no?**
- 6409 56:05 ((Gaelle)) ACM?
- 6410 56:10 **((naming provider's name)) or something? maybe I'm wrong (.) So the different**
- 6411 **providers don't they themselves buy from the same provider at least the raw materials**
- 6412 **u::h (.) like the basic**
- 6413 56:25 ((Brian)) so they probably
- 6414 56:25 ((Stephan)) it could be yes
- 6415 56:26 ((Daniel)) probably yes
- 6416 56:28 ((Stephan)) may be some stuff that they buy themselves
- 6417 56:30 ((Brian)) ((laughter)) Yes sure
- 6418 56:33 ((Stephan)) They would share the:
- 6419 56:33 ((Daniel)) Yeah because ()
- 6420 56:36 **so I was thinking about this this scenario (.) about you know getting your cells**
- 6421 **addicted to their (.) some of you said already that if you buy from a different provider**
- 6422 **you know for sure that this provider is not reliable because you see your cells dying (.)**
- 6423 **right? whether it's medium or sometimes different other things (.) but may be u:h is it**
- 6424 **because he (.) this provider is wrong (.) or because he does not have (.) what the bigger**
- 6425 **providers are putting in your medium and the cells are addicted to them?**
- 6426 57:14 ((Gaelle)) but if you want you can compare different type of medium and see which is:
- 6427 the best and:

6428 57:20 ((Brian)) ↓ and also you do sometimes medium here in the lab (.) and the cells still
6429 grow the same (.) so (.) if they are changing the composition
6430 57:29 ((Daniel)) maybe at the end it would have an effect if they're change the composition
6431 (.) I will not trust them anymore
6432 57:37 ((Stephan)) Yeah
6433 57:37 **But you don't know I mean something that you would not know of (.)**
6434 57:42 ((Gaelle)) but they are obliged to say
6435 57:43 ((Stephan)) yeah they are obliged (.) otherwise it's a criminal
6436 57:45 ((Gaelle)) = even if there is a change in the composition they have
6437 57:48 ((Daniel)) If they're lying about the composition [
6438 57:50 ((Brian)) in quality control you have also the: they check
6439 57:52 **these are huge companies that are monopolizing this industry (.) the:: you're**
6440 **talking about multibillionaire companies that are distributing**
6441 58:00 ((Stephan)) yeah but if they have add something (.) then may there are some body with
6442 cells that are suddenly responding different and then you'll be like hey let's compare this
6443 batch of medium to the other one and then if you see a difference then you'll ask the company
6444 hey there are something new about your medium and otherwise if they say no well you can
6445 do other tests (.) you can analyze yourself mass spec plc or whatever
6446 58:26 ((Brian)) yeah they check
6447 58:27 ((Stephan)) but (.) you you can check and then it would be (.) somebody would be hey
6448 there is something different
6449 58:33 **ok I'm not talking about that they add from time to time or in a specific batch (.)**
6450 **if it's consistently there all the time?**
6451 58:42 ((Gaelle)) but they cannot
6452 58:43 **why?**

6453 58:44 ((Gaelle)) because they are approved for example before (.) by u:h if it's
6454 pharmaceutical company (.) they're proved by FDA; if it's like::
6455 58:55 ((Brian)) external
6456 58:55 ((Gaelle)) = they're they have agreement and u::h
6457 58:59 **no but**
6458 58:59 ((Stephan)) it depends if it's a problem in (.) if they put glucose yeah your cells are kind
6459 of addicted to glucose (.) may be indeed yeah (.) but it's
6460 59:07 ((Brian)) and if you check the composition in the medium (.) it will be different from
6461 the one they state (.) you will say to them it's not right
6462 59:17 **that's for things that you can check or you know of but if**
6463 59:20 (((Brian Stephan and Daniel spoke are once. Inaudible)))
6464 59:21 ((Daniel)) you can't check everything
6465 59:23 ((Stephan)) normally you should be able to u::h
6466 59:23 **so for example there are compounds or molecules or like things that you cannot**
6467 **check because you you don't know (.) there is an unlimited number**
6468 59:31 ((Gaelle)) but for example if you do like HPLC u:h you will see each peak
6469 corresponding to the compound that you know and if it's there is something (.) extra (.) you
6470 will see a peak without
6471 59:41 **for every**
6472 59:42 ((Stephan)) Yeah
6473 59:43 ((Brian)) yeah it's possible of course
6474 59:44 ((Stephan)) it's possible you can detect with the right tools you can detect anything that
6475 is in there
6476 59:48 ((Brian)) but of course it's possible to put something
6477 59:48 ((Stephan)) everything is possible yeah

6478 59:51 **it's possible of what?**

6479 59:52 ((Brian)) to put something

6480 59:53 ((Daniel)) but then to put a chemical

6481 59:55 ((Brian)) = that is not detected like doping ()

6482 59:58 ((Daniel)) exactly

6483 59:58 ((Brian)) you can

6484 59:59 ((Daniel)) Yeah exactly the same it's pff

6485 60:02 ((Brian)) you can put something that's not detectable or

6486 60:04 ((Gaelle)) Yeah but you will see like [

6487 60:03 ((Stephan)) [I can imagine that they will do because they would induce a possible risk

6488 for a variation and unhappy customers and that is a loss in what you want to do as

6489 60:12 **I would say the opposite (.) why unhappy customers? Actually they will get**

6490 **actually they will actually in that way because they're distributing all over the world (.)**

6491 **they will monopolize (.) only their products would**

6492 60:24 ((Gaelle)) but it means that the other companies will put also something: in their

6493 medium to::: maintain the growth

6494 60:32 **Other companies that purchase the raw materials from them not the smaller ones**

6495 **(.) maybe the other companies that they are their competitors or their rivals maybe they**

6496 **are also using their**

6497 60:45 ((Gaelle)) But it means that you say that [

6498 60:46 ((Stephan)) but you're testing also your raw materials before you put them in your

6499 60:51 **they test them**

6500 60:52 ((Stephan)) yeah of course

6501 60:53 **They do (.) you don't test**

6502 60:55 ((Stephan)) No but it it it hhh

6503 60:56 ((Brian)) We are talking about
6504 60:58 ((Stephan)) You get variation and it could come up
6505 60:59 ((Brian)) = cheating
6506 61:00 **yeah cheating yes**
6507 61:02 ((Brian)) but this is could be in a company could be a politician could be your
6508 colleague
6509 61:06 ((Daniel)) there is no way to control cheating
6510 61:09 ((Brian)) but this is a more global problem then the provider of medium compare
6511 61:13 ((Gaelle)) it's like ((she mentioned an automobile maker)) and the::
6512 61:14 ((everyone laughing at once))
6513 61:16 ((Brian)) it's a global truth yes there is not something
6514 61:20 ((Daniel)) you need to trust them
6515 61:21 ((Brian)) exactly otherwise you won't trust any
6516 61:23 **yeah but we're not talking about something real I mean (.) if it's possible to**
6517 **happen or not (.) I mean if you think about**
6518 61:30 ((Gaelle, Brian and Stephan)) yes
6519 61:31 ((Daniel)) sure
6520 61:31 ((Stephan)) everything is possible but u:h at the end they will cut themselves ()
6521 because it will come out (.) any variation any deviation (.) from (.) people will notice
6522 somewhere (.) then at the end if if now it will be a suicide for the company to things like that
6523 61:46 ((Brian)) it's like this milk in china for the kids about babies yeah (.) it was
6524 contaminated
6525 61:52 **but what kind of risk it could happen (.) if this would happen for example (.)**
6526 **would it be u:h would it have implications on the resistance for example to drugs? The**
6527 **cells would resist to drugs? Or how they in terms of protein expression?**

- 6528 62:10 ((Stephan)) anything
- 6529 62:11 ((Daniel)) Yeah exact
- 6530 62:11 ((Brian)) We don't know but yeah (.) probably
- 6531 62:12 ((Gaelle)) uhm
- 6532 62:16 **ok let's move on to the third topic ((end of interview))**

Appendix D

Interviews transcriptions

Case 3: Do you own your research?

D1. Individual interviews (case 3)

6533 **Question 22:** What are the processes that you usually undertake to check and double check
6534 your results?

6535 **STEPHAN 22**

6536 11:00 **What are the processes that you usually undertake to check and double check**
6537 **your results?**

6538 11:06 to check and (.) well u:hm at least in my own results I double check by repeating the
6539 experJoannet itself (.) with if possible (.) separate samples so you're not biased from an
6540 already existing materials (.) other techniques also may be (.) eventually show (.) similar
6541 thing but using different methodology (.) just to be sure what you are finding is really correct
6542 and other wise also to ((recording cut))

6543 ((recording restart))

6544 0:02 **we were (.) what were we saying? ok we were talking about repeating and u:h you**
6545 **said [**

6546 0:08 [and I was also looking in u:h existing literature you can also see that at least certain
6547 basic measurements that you: or the experJoannet that you made normally it has to fit (.) with
6548 already published findings just to see that your model is valid

6549

6550 **Daniel 22**

6551 10:21 **What are the processes that you usually undertake to check and double check**
6552 **your results? So if you find results (.) what do you usually do to check that the results**
6553 **are (.) are right?**

6554 10:35 u::h to for sure we'd what we:: (.) normally do all that normally do it's really to repeat
6555 on different cell lines (.) to be sure that it's not due (.) just to the (.) cells which are (.)
6556 different or one time

6557 10:55 **so you that's uh different cell line (.) it mean a different person? of a different**
6558 **person right?**

6559 10:59 Yeah (.) or from different tissue

6560 11:03 **ok**

6561 11:04 And this we:: (.) we do it several times (.) and u::h we use also different techniques (.)

6562 Yeah to validate uh to validate the results

6563

6564 **Dilara 22**

6565 11:53 **what are the processes that you usually undertake to check and double check your**
6566 **results? généralement quelles sont les procédés qu'on [**

6567 12:03 [uh les procédés c'est de répéter l'expérience (.) tu dois répéter expérience (.) et

6568 multiplier aussi les: individus (.) donc tu peux pas faire les test une seule fois sur une seule

6569 souris (.) tu dois le faire plusieurs fois sur plusieurs souris (.) qu'on on dit plusieurs fois sur

6570 plusieurs souris c'est plusieurs fois dans le temps (.) parce qu'il y a des gens qui pensent que

6571 (.) faire plusieurs fois la même expérience le même jour c'est une reproduction mais non (.)

6572 ce n'est pas (.) et puis: pour vérifier aussi tu as besoin de comparer tes résultats avec un

6573 contrôle (.) donc c'est intéressant de: (.) si ta molécule est dissoute (.) donc de l'éthanol (.) tu

6574 dois t'assurer que c'est bien ta molécule qui induit cet effet là et pas l'éthanol (.) donc tu dois

6575 comparer aussi par rapport eu à l'éthanol (.) et puis c'est comme je (.) disais tout à l'heure (.)

6576 ce qui est euh sympa de faire aussi c'est de (.) que l'expérience soit reproduite (.) dans un

6577 autre labo (.) par d'autre personnes (.) là c'est c'est le most (.) mais: il ((laughter)) y a aucun

6578 (.) à l'université il n' y a personne qui fait ça (.) enfin l'université dans la recherche

6579 expérJoannetale (.) puisqu'il y a des universités

6580 13:25 **Pourquoi nécessairement dans un autre laboratoire (.) parce que (.) tu disais tout**

6581 **à l'heure (.) si on répète la la l'expérience (.) on la répète intégralement ou comment**

6582 **dirais je (.) mais uh pourquoi il faut que ça soit un autre laboratoire? tu peux donner à**
6583 **ton collègue et tu lui euh**

6584 13:43 oui ça c'est une vérification int (.) inter individus (.) donc tu vérifie si c'est pas toi qui
6585 influence l'expérience (.) avec le même matériel

6586 13:53 **oui si tu donne à ton collègue**

6587 13:54 Mais tu re tu reçois deux informations différentes là (.) parce que ça veut dire (.) si c'est
6588 ton collègue qui fait l'expérience il va utiliser le même matériel (.) que toi et donc ça veut
6589 dire que si vous n'arrivez pas au même résultat (.) c'est l'opérateur (.) qui a une influence sur
6590 le résultat (.) maintenant si tu demande à un autre labo de faire l'expérience (.) ça veut dire
6591 que c'est soit le matériel utilisé qui a une influence et ou l'opérateur (.)

6592

6593 **Gaelle 22**

6594 13:42 **what are the processes that you usually undertake to check and double check your**
6595 **results? Usually how do you check and double check your results?**

6596 13:49 So we make uh the experJoannet at least three times and u::h so with condition but at
6597 three different u::h times (.) u:h you can use also other techniques to confirm the results

6598

6599 **PAUL 22**

6600 0:01 **What are the processes that you usually undertake to check and double check your**
6601 **results? in the field or in this lab**

6602 0:07 well we try to reproduce the: the results u:h the same experJoannets done another day
6603 with another: series of cells u::h these the way we work (.) if we can ask::: another
6604 investugator to produce the same experJoannets it's even better but I think that if you can get
6605 twice the or three times the same results (.) uh using a variety of cell lines u::h and often you
6606 you use different techn techniques technologies to uh to better understand everything if if all

6607 confirm to to uh the same conclusion (.) uh it's also a way to valide what you try to claim is to
6608 (.) not only to reproduce the exact same uh experJoannets but to to also (.) truth by another
6609 way that (.) the results of the first experJoannet is uh is confirmed

6610 1:23 **so the aim is to reproduce the same experJoannet in a d with a different**
6611 **methodology (.) but you always pay attention to things that are basic and are repeated**
6612 **here and there and then**

6613 1:35 Yes (.) yes uh I mean we we need to be first convince ourselves that we are going to
6614 publish is is u:h relevant u:h and it's not uh due to uh (.) something which was uh there in the
6615 lab at that moment but that we (.) we did find the same u:h the same results (.) at different
6616 time that we could recapitulate these results and if we think that the cells is more glycoltic
6617 because it it consume more glucose (.) ben we need also to check whether it produce more
6618 lactate so when we put the two together (.) it's: something sort of internal validation that u:h
6619 we we u:h (.) that that support the final claim (.) so yes repeating and and uh and multiplying
6620 the (.) the (.) and using different techniques to uh to address uh a question

6621

6622 **Cédric 22**

6623 4:59 **What are the process that you usually undertake to check and double check your**
6624 **results? So if you do experJoannets and you find something and then what do you**
6625 **usually do in order to make sure that what you found was correct?**

6626 5:14 uh depending on the experJoannet but you can just try another way (.) like if you're
6627 using an inhibitor you try another inhibitor to see if the (.) you have the same stuff or you're
6628 trying to replicate your experJoannet

6629 5:28 **replicate?**

6630 5:29 Yeah (.) depen depending the type of experJoannet (.) sometimes you can't just (.)
6631 replicate (.) so you can just replicate it to see

6632 5:41 **so it can be replicating (.) it can be changing the instrument or the inhibitor? what**
6633 **else?**

6634 5:48 You've to just (.) you have to check it by another way I don't know (.) you sometime you
6635 check it (.) u::h (.) yeah you check by one method (.) you get the result so let's say I don't
6636 know you use the imagery and microscopy:: to look at something you saw different like (.)
6637 quantification (.) the fluorescence (.) then you're trying to look at it from (.) bio (.) molecular
6638 biology point of view by blots and stuff like that (.) so you can (.) have two time the same
6639 answer but by two different ways

6640

6641 **JOANNE 22**

6642 7:28 **what are the processes that you usually undertake to check and double check your**
6643 **results? So if you think about your (.) the experJoannets that you're doing now (.) what**
6644 **are the processes that you usually use to check and double check your results?**

6645 7:46 What do you mean by that? So I repeat the experJoannet

6646 7:48 **You repeat?**

6647 7:49 yes

6648 7:51 **ok**

6649 7:51 it's like (.) I don't know for a master they (.) they ask you statistics to do (.) so if they ask
6650 you things like that (.) your experJoannet should be repeated at least three times to be sure
6651 that what you found it's not just u:h something happened by (.) by chance like that (.) so you
6652 you always repeat your results (.) to confirm

6653

6654 **Question 23: Do you trust machines?**

6655

6656 **STEPHAN 23**

6657 0:29 **Do you trust machines?**

6658 0:31 u::hmm: not always (.) depending (.) I'm I always remain critical to see in the (.) it's
6659 also why I do my own controls and calibrations and all checks to see also whether the
6660 machine itself might have (.) error

6661 0:53 **but do you sometimes have to trust them?**

6662 0:56 sometimes you have to trust them hhh

6663 0:59 **like you have to?**

6664 1:01 u::h [

6665 1:03 **you have** [

6666 1:03 [you may so much so much treat it like a black box and uh you put something in and
6667 you get something out and it's (.) you just have to rely on what happens in between this (.)
6668 it's correct

6669 1:15 **is that you don't have more options (.) then to trust?**

6670 1:17 It's uh you don't have much more options yeah (.) to trust but that is u::h (.) but to: make
6671 easier to trust than you building specific controls into your experJoannets (.) normally that's
6672 what you use to evaluate the functioning of these machines (.) and if your few controls ensure
6673 you what you believe is really correct than you tend to believe also the rest of the data

6674 1:49 **ok do you need to trust them? Sometimes you need? it's a matter of need?**

6675 1:53 u::hm (.) yeah (.) to some extend we have needs to trust them because (.) well you only
6676 measure like for example: (.) 3 control samples and u::h 100 new experJoannetal samples (.)
6677 and you have to trust that (.) it is as valid for those 3 as for the other 100

6678

6679

6680 **Daniel 23**

6681 11:24 **ok (.) what about machines you use (.) do you trust machines? do you have to trust**
6682 **to trust them? do you need to trust them?**

6683 11:38 ((laughter)) these 3 points no: I would say that (.) in most of the cases we (.) if we
6684 know how the machine is u:h working (.) we can know (.) if we can know trust the machine
6685 or or not (.) so normally what (.) I don't like so much u::h when the machine is uh giving
6686 directly the results so (.) I prefer to analyze the raw data (.) and to:: to interpret by myself uh
6687 (.) the data ((noise someone interrupting)) but u:hm (.) sometimes we:: (.) it's not often the
6688 case we (.) or we say that for (.) yeah (.) normally we we:: (.) we have the the possibility to::
6689 to check (.) how the the results are: obtained

6690 12:40 **So you trust the machines that you work with?**

6691 12:45 In terms of the: technically yes (.) but for the: I have

6692 12:50 **I mean do you trust that they measure what you want to measure?**

6693 12:55 Yes

6694 12:56 **Because yes you can see graphs like ok nice graphs ok it's u:h bolder here it's**
6695 **darker there it's low percentage there but of what exactly [**

6696 13:08 [But it always it always depend if you:: uhm in your experJoannets you add (.) some
6697 controls (.) to be sure that what is measures it's true or not (.) if you have a positive control or
6698 negative control and you where is the differences (.) ok you can trust

6699 13:30 **I mean if you check and control (.) you are checking that uh the same fluctuation**
6700 **is reproduced (.) but fluctuations of what are you sure of what what you want to know**
6701 **or may be you can do it anytime and it's the same yes but is it measuring what you want**
6702 **to meausre (.) how can you make sure? for exampel if you can think about one machine**
6703 **here I don't know (.) the maxwell machine (.) that is u::h**

6704 14:02 to:: to extract RNA or DNA

6705 14:04 **Yes**

6706 14:05 But at the end what (.) yeah what we get from the maxwell we: (.) is it (.) this machine
6707 is able to give u::h the purity of RNA or DNA so (.) we can trust the: the samples we get with
6708 this machine

6709 14:26 **You can?**

6710 14:27 Yeah

6711

6712 **Dilara 23**

6713 14:30 **Do you trust machines?**

6714 14:34 ((laughter))

6715 14:34 **((laughter)) les machines que tu utilises ?**

6716 14:39 ((sighs outloud)) oui mais pas toutes (0.3) pas toutes parce que:: il y en a qui sont:::
6717 calibrées par l'Homme (.) et euh: je crois que ça il faut vérifier aussi

6718 15:02 **Parce qu'elles sont calibrées par l'Homme?**

6719 15:04 Oui

6720 15:04 **Donc elles ne sont pas parfaites (.) ok maintenant au delà du calibrage supposant**
6721 **que le calibrage est parfait (.) comment est ce qu'on peut mettre sûr que la machine**
6722 **mesure ce que t'as envie de mesurer?**

6723 15:24 (0.3) comment être sûr? Tu veux vérifier (.) si la machine mesure ce que tu veux (.) si
6724 pour toi c'est vraJoannet important (.) tu peux le faire avec un autre échantillon dont tu
6725 connais les résultats (.) donc si tu veux mesurer par exemple le pH d'une solution (.) de ta
6726 solution de ton milieu (.) tu veux mesurer le pH de ton milieu (.) pour être sûr (.) tu prends (.)
6727 d'autres solutions avec un pH connu (.) et donc si tu prends une solution à 5 (.) et tu prends
6728 une solution à 8 et que le machine te donne le bon résultat (.) et toi ton milieu est entre les
6729 deux (.) mais il y a des chances que ça soit bon (.) ou alors tu peux aussi (.) vérifier (.)

6730 confronter le résultat de la machine ((snicker)) avec une autre machine (.) par exemple une
6731 autre marque (.) ou alors une autre façon de doser l'élément que tu veux doser (.)

6732

6733 **Gaelle 23**

6734 14:16 uhm (.) **do you trust machines? Do you have to trust them or do you need to trust**
6735 **them? the machines that you use**

6736 14:24 u::h (.) fff u::h the machine yes but some the:: you can see that the results seems to
6737 be u:h (.) con not front but euh bizarre? hhh and

6738 14:43 **weird**

6739 14:43 weird and so:: u::h you can check for example if there is not a problem with the
6740 machine and also you cannot always trust (.) if there is a problem we can see: it and u:h try to
6741 resolve

6742 15:02 **ok you mean the results are bizarre or weird because they're not expected like**
6743 **that?**

6744 15:10 There are (.) because the (.) sometimes u::h you can see by eyes for example when you
6745 look you::: ↓ how to explain? u::hm (.) by basal condition if for example if we use basal
6746 condition each time the control con condition

6747 15:30 **you mean basic basic condition?**

6748 15:31 a control condition yes uh

6749 15:32 **ok control condition**

6750 15:34 if you: see that u:h for example you did experJoannetal times and you had always the
6751 same measure and the time after (.) the day after you have like u::h not the same u:h answer?
6752 you can think first maybe I did a mistake in my u::h in my experJoannet (.) may the machine
6753 has some problem so you can look to the machine and u:h try to solve it (.) and if the machine

6754 has a problem you can do again the experJoannet and see if you did a mistake in your
6755 experJoannet or (0.2)

6756 16:14 **ok actually I meant something else (.) uh I meant uh do you (.) are you sure that**
6757 **the machines measure what you want to measure? are they really measuring what ou**
6758 **want to measure?**

6759 16:29 I don't under so if (.) if the machine?

6760 16:33 **Is the machine really measuring for example you get figures you get colors**
6761 **different shapes different grades like of colors but are they really indicative of what you**
6762 **want to know? or just ok (.) you can have this all the time**

6763 16:50 I hope (.) the m the machine are calibrated (.) so:: (.) normally I hope they give
6764 ((laughter)) what you is normally uh (0.3)

6765 17:08 **Is there a way to check?**

6766 17:10 The calibration?

6767 17:10 **Not the calibration (.) to know that (.) how can I be sure that it's measuring what I**
6768 **want to measure?**

6769 17:18 uh for example (.) for the:: the CMA (.) you can make uh like u::h it's meas it's
6770 measuring the: the glucose consumption (.) so you can make by yourself a solution (.) with
6771 u::h for example 10 milli molar concentration you use the machine and you look if it's giving
6772 10 milli molar concentration or not (.)

6773 17:41 **how how do you see it?**

6774 17:44 = Then

6775 17:44 **How do you see it? What do you get from the machine later?**

6776 17:47 So the machine will u::h measure by spetrometry the: concentration are you saying?

6777 17:53 **It's colors? It gives you colors right?**

6778 17:56 Yes

6779 17:57 **The circles**

6780 17:58 But you will not see:: it's not with u::h it's the machine down so

6781 18:04 **down stairs?**

6782 18:06 Yeah (.) but everything is automati::: automatisé?

6783 18:11 **Automatic**

6784 18:12 So when you will not see uh what the machine is doing (.) but finally have the:: on the

6785 screen like the:: concentration that the machine calculate

6786 18:27 **Yeah but how do you know what you see on the screen is really**

6787 18:32 Because if you put the: you know the concentration in the beginning and the machine is

6788 giving you the same concentration (.) the machine working

6789 18:41 **Uh you can still measure the concentration in a different way**

6790 18:46 If you:: if you::: weight your powder and you put it (.) it's just the control

6791 18:54 **uhm**

6792 18:53 If you weight your powder ((meaning weigh)) you put it in yh the medium (.) you

6793 know your concentration (.) and so if you put it in the machine (.) and the machine is giving

6794 you the right concentration it's the machine is working (.) if the control an internal control

6795 19:17 **Ok but sometimes (.) what the machine that's measuring the: you see the that you**

6796 **use every day you use actually the ones with circles the circules that are from yellow to:**

6797 **to red**

6798 19:32 Ah the vector?

6799 19:35 **The vector yeah (.) it's it's supposed to indicate what?**

6800 19:40 uh different things (.) you can measure different stuff (.) you can measure (.) it will

6801 give you fluorescence or absorbance (.) but it comes from different experJoannets (.) you can

6802 you can look for the salability you can look for consumption of u::h () several steps you can

6803 measure ATP

6804 19:59 **Is it one type of black box (.) like you don't know how it works uh**

6805 20:04 Yes (.) because you have the:: you have the reference manuals so you can you know
6806 how it works (.) the light will come through uh filter and then uh it will uh read the
6807 absorbance (.) so you know basically how it works

6808

6809 **PAUL 23**

6810 2:41 **Ok (.) do you trust machines? Do you have to trust them or do you need to trust**
6811 **them?**

6812 2:47 I have to trust them (.)

6813 2:51 **You always know know for sure that they are measuring what you want to**
6814 **measure?**

6815 3:00 I u:h I think they measure what I want them to measure (.) u:h the exact term of the
6816 question were?

6817 3:13 **Do you trust the machines that you use**

6818 3:14 Yes

6819 3:15 **and and the you trust that they measure what you want to measure**

6820 3:18 Yes

6821 3:19 **Independently (.) if you see the chart you see something is increasing in function of**
6822 **something that add and here it's decreasing and you repeat all the time the same results**
6823 **so you say so the the machine is functioning well but is it functioning well is it**
6824 **measuring exactly what I want to measure or it's just consistent with the measurement**
6825 **but I'm not totally sure that it's measuring what I want to measure**

6826 →3:48 (0.6) I don't ask myself these kind of questions (.) I'm I I consider that is being
6827 measured is uh reflects the the reality (.) I I don't doubt the except if if again we have
6828 obtained ten times the same thing and the eleventh time we do the experJoannets we have u:h

6829 we have uh bizarre behavior than we could start to check whether is the machine is is
6830 working properly but we we do the maintenance of the machine in order to: to to get them: uh
6831 as uh as efficient as possible (.) this is uh usually checked for the machine why you have
6832 them the highest risk of uh of problems this is checked by companies uh who knows the
6833 machine better than than we do and who come to validate them using specific QC protocols
6834 or quality control protocols (.) so we we are prone to to believe (.) the machine

6835 5:05 **Because there is a difference between the machine being consistent and we can**
6836 **check and double check that the results are consistent (.) and (.) that they are measuring**
6837 **what you want to measure (.) two different things**

6838 5:19 I I think that in (.) when we buy the machine (.) they're more and more uh expensive (.)
6839 we we do u:h we do compare the one on the markets we get advices (.) we: we discuss with
6840 colleagues already using the machines so we make our minds in order to (.) finally buy the
6841 machine which (.) for which we are convinced that it does measure what we (.) u::h want to s
6842 to be measured and then it's a real it does truly reflect the parameter we we uh which is the
6843 one to investigate so we uh uh it's not like we we're dealing with black box we're dealing with
6844 machine which which are uh which have been validated by by others uh (.) so uh we we have
6845 reference on on what we should get with ourselves (.) if we measure the the lactate or the
6846 glucose concentration (.) if if we get a concentration of 10 millimolar (.) uh consumption of 2
6847 days we know from the literature that this amount is is uh fits the reality (.)

6848

6849 **Cédric 23**

6850 6:27 **ok (.) do you trust machines?**

6851 6:29 Yeah

6852 6:31 **You do? Is it like you have to trust them or you need to trust them? or**

6853 6:36 no just they're designed to do what they are doing so

6854 6:42 **and how do you know they they are fonctionning u:h for example measuring what**
6855 **you really want to measure?**

6856 6:50 ((sighing)) I don't know it's (.) just they are designed like that (.) it's like if you're using
6857 Word but you type a double b you see the double b on the screen you know that the machine
6858 is doing the right stuff (.) so ((sighing))

6859 7:08 **uh you're talking about the word processing?**

6860 7:10 Yeah

6861 7:10 = **for example (.) but I mean talking about machines that are more complicated (.)**
6862 **because you see (.) if you're talking about processing (.) you see already the result (.) but**
6863 **I mean (.) for example the graphs the colors the different shapes that you have how do**
6864 **you know that they really reflect what you want to measure? or not something else?**

6865 **Because it's a black box right you don't know how it functions technically**

6866 7:35 Yeah but it depen depend of the machine (.) if you're using the spectrophotometer (.)
6867 you know that you're sending the right u:h the right u:h beams inside and then you get the
6868 right measure that's it (.) and then you have to check your machine for (.) like by
6869 professionals just to make sure it's (.) working

6870 7:58 **calibration?**

6871 7:59 Yeah that's the calib (.) annual calibration: depending on what machine you use (.)

6872 8:05 **so for example the machine that you use to check the density (.) of the proteins [**

6873 8:12 [Yeah this is photometer

6874 8:15 = **it gives you like different colors right? and so you have columns with the**
6875 **different shades of colors that the more (.) darker it is the more density there is right?**

6876 8:25 Yeah

6877 8:26 **So (.) are you sure that this you know shades of colors really reflect the density of**
6878 **the of the proteins?**

6879 8:36 Yes (.) but that's not the machine (.) I mean you can see it in your plate you put the
6880 compound you see like if you have more color you know that you have more proteins then
6881 the machine just quantitate it ((meaning quantify))
6882 8:51 **You can visually see it on the plate you said? So it's not only uh so it's visually**
6883 **possible right? ok let's talk about the maxwell machine that calculates the RNA and**
6884 **the:: what you (.) the maxwell machine**
6885 9:06 Yeah it's just to preparing I don't know (.) I never use these ones
6886 9:09 **or the QPCR machine that [**
6887 9:12 yeah
6888 9:12 = **it's ok (.) these are very very uh sophisticate machines**
6889 9:15 Yeah
6890 9:16 **That go: into the DNA RNA and really very very sophisticated (.) so do you trust**
6891 **that they do what they are supposed to do?**
6892 9:27 Yeah that's why you pay a lot for these machines (.) so if if they start not to work (.)
6893 sometime you can have trouble and then you call the man from the company (.) and he ca he
6894 can he can come to see what's going wrong (.) sometimes of course it will take you one or
6895 two months to see that there is something going wrong with the machine
6896 9:47 **but I'm talking about when the machine get uh u::h broken or out of order (.) I'm**
6897 **talking about (.) people who manufacture the machine (.) don't know about biology (.)**
6898 **they are technicians electricians uh software designers but they don't know really what**
6899 **you in particular want to see (.) so you you end up having you know charts figures and**
6900 **graphs like these but they cannot make sure that these graphs really reflect what you**
6901 **want (.) because they don't know the aim [**
6902 10:21 [Yeah but that's that's YOU (.) that I have to work with the machine in the right way
6903 (.) so the man designed the machine to uh sense fluorescence (.) so then you use the primer

6904 data fluorescence and the machine is going to sense the fluorescence (.) just going to give you
6905 the amount of fluorescence in your in your wells that's all
6906 10:46 **No the machine can function very well actually because it is consistent (.) every**
6907 **time you give it this it gives you this value u:h you see the fluctuations or everything can**
6908 **work very well (.) but is it really measuring what you want to measure? or it's changing**
6909 **based on other factors that [**
6910 11:06 I don't see why it would do that (.) it's it's a counter and it gives what what you are
6911 measuring like if you want to measure fluorescence so it's measuring fluorescence
6912 11:20 **Ok so you're pretty well trust the machines that you**
6913 11:23 Yeah
6914
6915 **JOANNE 23**
6916 8:25 **do you trust the machines that you use?**
6917 8:29 Yes (.) and the well ((laughter)) (0.4)
6918 8:37 **is it like you need to trust them or you have to trust them? You have no more**
6919 **options?**
6920 8:46 Yes I have to trust them because I don't I don't really know u:h machines and stuff like
6921 that but u:h if it is used by everybody like I have to trust them ((laughter))
6922 9:01 **ok for example [**
6923 9:01 [it's not stupid people who're making those machines so
6924 9:04 **they must be smart? Those (.) people who made them**
6925 9:07 Yes
6926 9:08 **but they can there is a profit may be behind that so they have to:**
6927 9:13 Yes may be
6928 9:13 = **to produce something**

6929 9:15 Yes they must produce something it's like it's not like u:h for example if you use a ma
6930 machine to:: to check the concentration and stuff like that it's not a stupid thing (.) it's correct
6931 9:29 **ok but uhm but (.) do you know or how can you know for sure that the machine is**
6932 **measuring what you want to measure?**
6933 9:39 Because we use like some kind of specific u:h reagents for that specific enzyme to
6934 check that specific product or something like that so (0.3) you know
6935 9:56 **No I mean how do you make sure that the machines are measuring what you want**
6936 **to measure (.) I mean you still can see the variations or for example the different colors**
6937 **spots the shades you know from yellow to red and if you do it over and over again you**
6938 **say ok this machine is consistent so it's giving you know something logical (.) and you**
6939 **repeat and it's the same thing (.) but at the same time how do you know that what the**
6940 **machine is measuring is what you want to measure?**
6941 10:30 So as for the machines I'm using (.) it's like as I said to you (.) what we what you what
6942 you use is the specific reagent (.) if I want to use like measure glucose (.) you will use
6943 specific reagent that will detect the glucose (.) it will not like detect something else in the:: in
6944 the medium like t will detect only glucose (.)
6945 10:59 **Let's talk about the machine that you use after you finish the western blot and**
6946 **you get the the the: samples in that machine sthat gives you the circles the: discs from**
6947 **yellow to::: red (.) or you choose the colors of the ones there**
6948 11:19 For?
6949 11:19 **After you work on the western blot you put your samples in the machine**
6950 11:26 u::h (.) it's before the western blot
6951 11:28 **it's before?**

6952 11:30 Yes it's a protein dosage (.) so you will use the reagent that will interact only with
6953 proteins and as much as you have proteins (.) the f the the: color will be more intense and you
6954 have fluorescence

6955 11:43 **ok how do you know that the color is really indicating the amount of proteins?**

6956 11:53 It's like a measure of fluorescence (.) they measure the fluorescence of the protein like
6957 ou have uh (.) this reagent will interact with the proteins and they will use submit something
6958 and that thing will be measured and then you will do a curve étallonage

6959 12:14 **how do you know that the curve is measuring what you want to know? It**
6960 **corresponds to what you want to know? So if the curve is high you say what? We have a**
6961 **lot of? of what?**

6962 12:31 what?

6963 12:31 **If the curve is high**

6964 12:33so I don't know like you have some things like this étallonnage you have from this to
6965 the highest one (.) and that fluorescence range (.) you have u::h

6966 12:50 **you can draw it here if you want ((handed her a pen and a paper))**

6967 12:51 ((started to draw)) see for example you will have like a control samples (.) coupe
6968 d'étallonage (.) you will have something like this (.) Here we get the concentration (.) and
6969 here you have u::h fluorescence ok?

6970 13:10 **yeah**

6971 13:11 so you get (.) this is the curve (.) this is the max and this is the mean so when you do
6972 your measure (.) the fluence fluorescence you'll get for the protein will be could be between
6973 between those two (.) so it will be for example he:re and you project and you get the
6974 concentration

6975 13:29 **Yeah ok how do you know then this increase (.) is really reflecting the increase of**
6976 **u:h**

- 6977 13:38 Yes
- 6978 13:40 **How do you know?**
- 6979 13:41 WHat how do I know?
- 6980 13:43 **How can you make sure that it's (.) the curve is really refelcting that?**
- 6981 13:53 I didn't get your question exactly
- 6982 13:55 **so it's uh it's indicating what this curve? this one augmentation of what?**
- 6983 14:02 see depending on the fluorescence what concentration you will get
- 6984 14:06 **the concentration of what?**
- 6985 14:06 The concentration ok?
- 6986 14:08 **how do you know that this curve is reflecting the concentration?**
- 6987 14:18 I don't know
- 6988 14:19 **there is no other way to know?**
- 6989 14:22 May be if I ask I will know
- 6990 14:23 **ok**
- 6991 14:24 I will get the answer
- 6992
- 6993 **Question 24:** Do you trust the products that you purchase from the other companies?
- 6994
- 6995 **STEPHAN 24**
- 6996 2:20 **do you trust the products that you purchase from the other companies?**
- 6997 2:25 u:h y:: (.) in general I trust them (.) but I also perform some of my own checks to (.)
- 6998 evaluate their them being correct (.) and at times I also find that (.) may be they were not as
- 6999 they should
- 7000 2:49 **so you sometimes check again?**

7001 2:50 At (.) sometimes I double check things (.) functionality like now (.) I also have
7002 something ordered (.) I didn't like what I see and I contacted the company like I think may be
7003 something wrong (.) can you explain me why I see what I see?

7004 3:05 **what do they say?**

7005 3:08 I'm now waiting for thehhh ((laughter))

7006

7007 **Daniel 24**

7008 14:29 **Ok (.) u:h Do you trust the products that you purchase from other companies?**

7009 **products**

7010 14:36 what?

7011 14:36 **Products (.) for example reagents uh medium uh any product that you use not**

7012 **machines**

7013 14:43 Uhm normally yes (.) sometimes we have surprise but uh but yeah in most of the cases

7014 we:: I would say it's also depending of the company we know that some companies uh

7015 depending on the batch of the product or whatever we can have some problems but uh

7016 15:05 **depending on?**

7017 15:07 The batch (.) uh le lot ((translating batch into French))

7018 15:09 **ok**

7019 15:13 We can: have some viability (.) yeah (.) the efficacy of the product

7020

7021 **Dilara 24**

7022 **Do you trust the products that you purchase from the com other companies? Donc tous**

7023 **les consommables que vous utilisez ?**

7024 16:44 On général oui (.)

7025 16:47 **Because you need or you have to?**

7026 16:49 ((laughter))

7027 16:49 ((laughter))

7028 16:53 Je crois que We have to ((laughter))

7029

7030 **Gaelle 24**

7031 20:25 **ok (.) do you trust the products that purchase from other companies? The**

7032 **consumables?**

7033 20:34 Yes (.) otherwise we will not ((laughter)) use them (;) and they have to:: take uh check

7034 so they have quality control in industry so::

7035 20:48 **Ok for example you you use the medium for every single research**

7036 20:53 Yeah

7037 20:55 **Right? and how can you make sure that the medium does contain other molecules**

7038 21:00 because they give you the recipe so so:: if there is something else they have to:: tell us

7039 21:11 **they give you the recipe?**

7040 21:12 Yeah

7041 21:15 **but uh (.) you don't test right? you don't check it?**

7042 21:20 No

7043 21:21 **Right?**

7044 21:22 No we don't check u::h

7045 21:25 **You don't and even if you check for example may be you check about u::h**

7046 **molecules that you know (.) for example or you want to check I don't know (.) acidity or**

7047 **anything like that (.) but there are an unlimited number of molecules that exist in the**

7048 **world and you cannot check them all**

7049 21:45 uhm (.) but since we cannot check (.) we will not (.) we are not able to check

7050 ((laughter))

7051 21:53 **Yeah (.) Yeah but they they know what they put there (.)**

7052 22:00 Yes but if they know what they put in (.) they will (.) it's u::h a nonsense to not tell uh

7053 (.) the people (.) who buy it so (.) there is no reason to tell you that it's the wrong uh

7054 22:15 **But if they are supposed to be medium special for their cells (.) imortilized cells (.)**

7055 **if they think they need to add that uh that molecule because (;) they need the cells not to**

7056 **die otherwise you'll not purchase so they really need that molecule**

7057 22:37 But what they will not uh tell that this molecule is (.) there is no::

7058 22:48 **Usually labs work with primary cells right? Prefer**

7059 22:52 uhum

7060 22:52 **It's better right?**

7061 22:54 uhm

7062 22:54 **but the problem with the primary cells is that they they die easily**

7063 22:59 uhm

7064 22:59 **but the immortalized cells are uh may be better beavause you can rely on them and**

7065 **work (.) but that depends on the medium (.) no?**

7066 23:10 You can use (.) I always work with (.) cancer cell lines (.) but you can I don't know

7067 which type of medium they use for primary culture cells but I (.) for example I use the:: I

7068 isolate u:h lymphocytes (.) and I was able to make them grow in the culture medium we have

7069 there so (.)

7070 23:39 **Primary cells?**

7071 23:40 Yeah

7072 23:42 **And why then you go to those**

7073 23:44 Because I want cancer cells (.) it was normal lymphocyte so (.)

7074

7075

7076 **PAUL 24**

7077 6:41 **Now do you trust the products that you purchase from other companies? Not**
7078 **talking about machines now like for example the medium anything that (.) the**
7079 **consumables**

7080 6:55 uh uff (.) again we (.) they are products for which it's quite easy to see whether it works
7081 or not (.) if you take an antibody (.) u:h it's easy for us to see whether it works or not (.) u:h
7082 you do the: the experJoannets (.) you try to detect a protein (.) you know (.) that protein is
7083 there or is not there (.) and you know at which size and some characteristic of the protein so
7084 (.) if the antibody does not recognize the protein then you know that the antibody does not
7085 work (.) u::h having done these kind of excerce::: exercise several times we we know that
7086 there are company which are not trustable (.) we know that everybody knows that in in
7087 science that if you buy an antibody from a company called ((company name removed)) u:h
7088 you have uh much less chance than with any other type of companies that the antibody will
7089 work (.) so they are less uh reliable

7090 8:02 **ok that's for the things that you can test (.) but there are so many things in biology**
7091 **that you cannot test all so if you by chance happen to know that the other lab in the**
7092 **other corner of the the world knew that that product really did not contain what it was**
7093 **supposed to contain but there are so many other things that can be there and you**
7094 **cannot even figure out**

7095 8:25 Yeah there there there you are (.) you are blinded (.) you are acting as uh as uh being
7096 just prone to believe that uh what you are using is is uh doing what you what it is described to
7097 do

7098 8:46 **and the issue is that that's (.) consumables are used everywhere in the world it's**
7099 **only in this lab so may be if there is a mistake or a problem it would be everywhere so**
7100 **you wouldn't know (.) nobody would figure it out**

7101 9:00 clearly (.)

7102

7103 **Cédric 24**

7104 11:22 **Ok (.) do you trust the products that you purchase from other companies for**

7105 **example u:h the immortalized cells the medium the:: the reagents everything that you**

7106 **buy you trust that they are doing their [**

7107 11:41 [Yeah (.) if you buy from the right firm yes you can (.) ↓ you can trust them

7108 11:46 **the (.) so the only way to to make sure is if you buy from the right firm?**

7109 11:51 Yeah yeah I mean if you take like ((company name removed)) or u:h ((company name

7110 removed)) or ((company name removed)) you know that you're buying good product that if

7111 you start with smaller firm you're (.) or sure of what they are problems (.) but then maybe it's

7112 the right product

7113 12:09 **So for you it's right because the company has a big reputation? That's the way [**

7114 12:13 [yeah oh yeah it's right because of the reputation of the (.) you know that if you're

7115 working with this product it's ok (.) because it's a firm that has the reputation to to provide

7116 good products

7117 12:25 **That's the way to make sure that the product is u:h [**

7118 12:27 [No

7119 12:27 **is there other ways?**

7120 12:28 Yeah then you can conform it but

7121 12:31 **For example? If you take a medium from this company (.) you buy (.) and the**

7122 **there is a molecule in the medium that you're not aware of (.) and you cannot even test**

7123 **it because there is unlimited number of molecules in the world you cannot test (.) you**

7124 **don't know what is there so you can conduct a test to check if THIS molecule that you**

7125 **know is there or not (.) but you cannot conduct a test to check all the molecules in the**
7126 **world?**

7127 13:00 Yeah

7128 13:01 **So you cannot basically test the medium to check if there is something added to it**
7129 **(.) right?**

7130 13:08 Why would it?

7131 13:09 **why ?**

7132 13:11 Why would it?

7133 13:12 **Yeah again**

7134 13:12 [why would they do that?

7135 13:15 **so again again it's a matter of u:h trust?**

7136 13:17 Yeah

7137 13:17 **Because you trust that they would not add?**

7138 13:20 Yeah (.) but there is no point for them to add a molecule that is not listed in the
7139 product

7140 13:29 **How do you know that there is no point?**

7141 13:32 For them there is no point (.) it's not like tobacco you can put stuff to get people
7142 addicted (.) for the medium there is no point to do that (.) if they put like (.) something inside
7143 it and it can be toxic for some cells (.) your cells die with this medium

7144 13:47 **not necessarily toxic (.) for example the cells you use are immortalized right?**

7145 13:52 Yeah

7146 13:52 **So (.) for example you don't all the time work with primary cells so you need**
7147 **immortalized cells and those who provide immortalized cells also provide the medium**
7148 **(.) together (.) so they need this (.) to add this molecule in order to get the cells immortal**

7149 **(.) but if they know that you know that this molecule is there it (.) doesn't work for your**
7150 **research**

7151 14:19 I I didn't your point

7152 14:20 **You did not get it?**

7153 14:21 No

7154 14:23 **You said there is no point interest for the (.) the provider to add something**
7155 **without saying right? This is basically trust? You just trust them (.) but if they know**
7156 **that this molecule would help in the immortalization of the cells**

7157 14:39 Yeah but the cell is already immortalized

7158 14:43 **Through what?**

7159 14:44 Through different processes like all the cell we have in the lab they are fifty years old
7160 (.) for the most of them were (.) some are most more recent

7161 14:55 **What about the medium? Cells are fifty years old**

7162 14:59 No the medium is (.) I don't know may be some formulations are (.) fifty years old I
7163 don't know I will check the composition of the medium but I guess: the people who
7164 immortalize like the cell (.) they design the right medium to go for it with the right amount of
7165 nutrJoannets and everything and uh the company just take the recipe optimize it and then just
7166 take it

7167 15:26 **ok so you pretty well (.) you you (.) it's a matter of trust but ok let's suppose**
7168 **suppose there is interest in adding (.) u::h any type of interest (.) it's hypothetical ok?**

7169 15:41 ok

7170 15:43 **what kind of consequences it could have on your research (.) suppose that all the**
7171 **research that you're doing you're not really aware that's constantly there and is there in**
7172 **any research that you do (.) what are the consequences can it have?**

7173 15:59 It's impossible to know (.) depend of what you're doing (.) depend if the molecule

7174 interacts with the pathway studies (.) it really depend on that

7175 16:09 **It can be open to anything?**

7176 16:10 Yeah (.) yeah of course if you like uh if you put u::h a form in your medium you will

7177 add terrible consequence if you put like I don't know (.) fructose instead of uh 1% of the

7178 glucose (.) may be won't have any consequence

7179

7180 **JOANNE 24**

7181 14:28 **ok (.) do you trust (.) the products that you purchase from other companies?**

7182 14:39 uhm yes (.) I have to trust them otherwise ((laughter))

7183 14:50 **For example u::h (.) if you think about the medium can there be a molecule in the**

7184 **medium that you're not able to know what are (.) there is an unlimited number of of**

7185 **molecules in the world right?**

7186 15:06 Yes

7187 15:07 **and you (.) if there is a molecule there (.) that you're not aware of and that is**

7188 **constantly there**

7189 15:13 I won't I won't know about that (.) but you have to use it

7190 15:26 **So suppose that there is a molecule there constantly in the medium that constantly**

7191 **use for every research and u::h suppose that it's always there and it's always interfering**

7192 **in the research results (.) what what's (.) how serious is this?**

7193 15:51 I think they use the media depending on what you you are doing as a resear research (.)

7194 so sometime you add things if you want to see other things other times you (.) you change the

7195 media from another one

7196 16:05 **No no no I mean (.) other molecules that are not supposed to to be there**

7197 16:09 So by m you mean by u:h by chance like that? So here we don't we know what the
7198 company is telling as that the media
7199 16:18 **Yeah the company is telling you but**
7200 16:20 Yes (.) so usually it should be like (.) the company should have some kind of u:h
7201 checking maintenance stuff like that (.) so they should not sell something and they are not
7202 telling the truth (.) it's not uh again (0.6)
7203 16:42 **but there is no other way to check?**
7204 16:47 like here you do your media and you use it directly (.) you never check what molecules
7205 you have or these small thing (.) because they tell you (.) when you buy the product you'll get
7206 what is there
7207 17:05 **but if if for example it happens say (.) let's say ok (.) let's say worst case scenario**
7208 **(.) if the company is doing it on purpose (.) and it's distributing all over the world (.)**
7209 **how serious can this be?**
7210 17:23 It will be very serious but I don't think I don't think they will do something like that
7211 like the government should uh ((laughter))
7212 17:31 **((laughter))**
7213 17:32 ((laughing)) If there is only big company to sell stuff like that so it should be u:h all all
7214 the time check and stuff like that
7215 17:43 **Let's talk about seriousness now (.) if it happens (.) if it's happening (.) ca this be**
7216 **really serious?**
7217 17:50 Yes of course (.) some results will be false
7218 17:54 **and if it's the medium that is distributed in all over the wor (.) you know there are**
7219 **you companies that distribute all over the world right?**
7220 18:02 Yeah
7221 18:02 **that would be have a lot of impact? right?**

7222 18:06 Yes

7223 18:08 **Now (.) it's very serious but you don't think that it's possible maybe it's not u::h**

7224 18:14 I don't think it's possible

7225 18:17 **you don't think it's possible (.)**

7226 18:20 may be like when you will have one or two bottles like when they do the check they

7227 they slip there is one slip may be you know but but I don't know for ALL the things that they

7228 say there is something wrong in it? No I don't think so (.) there's they have to check before

7229 they sell (.) so I don't I don't know the law exactly of u:h when you buy those companies

7230 what they do inside their companies and stuff like but logic (.) ((laughter)) they have to check

7231 what they are (.) they 're selling before selling to other people.

7232

7233 **Question 25:** In your everyday experJoannets (.) what is the ratio of the operations that are

7234 made ready to you by other parties?

7235

7236 **STEPHAN 25**

7237 3:10 **ah ok (.) in your everyday experJoannets what is the ratio of the operations that**

7238 **are made ready to you by other parties? example cells are purchased (.) the medium too**

7239 **trypsine is purs purchased (.) machines do calculations for you et cetera et cetera**

7240 3:40 Yeah it's indeed when you think about that it's u::h (.) probably like 80% or something

7241 of the stuff is actually ready but we mostly do is (.) combining the different things in different

7242 settings to have a different conditions and just (.) see what happens (.) what basic sources

7243 originally might happen yeah (.) already pre poc pre made by the providers

7244 4:10 **what are the risks of that? I'm not talking about you in person because you're**

7245 **saying you're checking**

7246 4:17 yeah the r:: the risk of that of course is like if u::h you're assuming that something is like
7247 one batch to the other batch should be the same but you're just assuming that this indeed
7248 correct but (.) there is a possibility that this is not (.) and sometimes you might have studies
7249 have like (.) you get variations because of the inconsistencies in the product (.) I know from
7250 certain tissue culture experJoannets that they need it to have specific batch of product (.) to
7251 have the same reproducible results

7252 4:53 **Particularly that the companies that provide those consumables and uh (.) are are**
7253 **few you know there are a couple of companies that are providing this to all over the**
7254 **world so if there is a mistake in this or that product that means that it will be (.) a a**
7255 **general mistake everyway in the world**

7256 5:11 Yeah exactly (.) u::h so for sure there is indeed u:h that is risk for that and (.) to some
7257 extend we cannot really avoid it but u:h (0.3) there is (.) the only way that we have to check is
7258 by (.) I think maybe other people doing similar kind of experJoannet but may be using them
7259 from different manufacturers and then see (.) but yeah it's it's an inherent risk

7260 5:47 **you said 80% of things are ready made?**

7261 5:50 I think so yeah

7262 5:52 **So your research is only in the 20%?**

7263 5:59 u:h at least of creating our materials and stuff yeah (.) 80% of the materials and tools
7264 that we use is ready (.) because we don't have to make our own media (.) it's already (.) the
7265 cells they're already created by the (.) like when study colon cancer we don't own the cancer
7266 cells we don't own the medium and everything we just use to put them at this temperature or
7267 we choose to add another chemical but the other chemical that we have is also made by
7268 another one

7269

7270

7271 **Daniel 25**

7272 15:21 **ok (.) in a in your everyday experJoannets (.) what is the ratio of the operations**

7273 **that are made ready to you by other parties (.) for example (.) the cells are purchased (.)**

7274 15:35 The cells are what?

7275 15:34 **purchased bought you buy them**

7276 15:36 uhmum

7277 15:37 **the medium too (.) the trypsine you buy them (.) machines do calculations for you**

7278 **(.) and if you think about your daily rop operations (.) how much is u:h something that**

7279 **is already given to you (.) that you don't do yourself ?**

7280 15:59 hhh well (0.4) I don't know it's uh (0.3) 30 percent?

7281 16:10 **ok**

7282 16:10 because

7283 16:15 **yeah**

7284 16:15 ((silence))

7285

7286 **Dilara 25**

7287 17:02 **ok (.) in in your everyday experJoannets (.) what is the ratio of the operations that**

7288 **are made ready to you by other parties? Si on parle en termes de pourcentage (.) si tu**

7289 **penses à ta dernière recherche (.) quelles sont les opérations qui sont vraJoannet (.)**

7290 **readymade to you (.) et quelles sont les opérations que vous faites (.) que tu as fait toi**

7291 **même (.) et en terme de pourcentage qu'est ce que ça représente?**

7292 17:43 Pourcentage de temps?

7293 17:45 **euh temps et de de nombre de combien de combien de::: si tu imagines ta toute**

7294 **une recherche d'ailleurs je vais te montrer tes collègues ((showing her colleagues**

7295 **diagrams in my journal)) c'est comme un diagramme (.) voilà les étapes (.) il y a**

- 7296 **plusieurs étapes dans une recherche (.) par exemple il me faut des cellules les cellules je**
7297 **les achète (.) après il faut que je les mette dans le: le frigo (.) je l'achète (.) après quand**
7298 **je commence je commence par la la comment dirais l'incubation ou le le il faut un**
7299 **incubateur je l'achète l'incubateur le milieu le l'achète (.) euh je sais pas après les étapes**
7300 **après il me faut ou tel médicament je l'achète le médicament (.) et**
- 7301 18:35 Je dirais en temps peut être que je fais enfin je faisais (.) 50% moi même (.) point de
7302 vue temps parce que les cellules donc étaient issues de l'animal (.) donc c'est ça?
- 7303 18:59 **Je cherche un bic (.) c'est pas grave**
- 7304 19:06 Puisque je prenais un animal je prenais les cellules (.) ça me prenais plus d'une demie
7305 journée (.) pour avoir les cellules (.) donc c'est moi qui fais tout
- 7306 19:17 **Tu prends les cellules toi même?**
- 7307 19:18 Oui (.)
- 7308 19:19 **ah d'accord (.) de de de chez?**
- 7309 19:20 Du rat
- 7310 19:23 **Du rat d'accord ok**
- 7311 19:22 oui du rat (.) puis après je les mets moi dans des plaques de cultures (.) plaques de
7312 culture que je mettrai dans l'incubateur que j'achetai (.) ensuite je change le milieu (.) le
7313 milieu j'ai acheté différents constituants (.) mais le milieu je le prépare moi même (.) et donc
7314 la préparation du milieu (.) ça me prend euh disons 20 minutes (.) pour préparer le milieu puis
7315 après tu changes (.) tu changes le milieu (.) de tes cellules (.) puis quand elles grandissent euh
7316 imaginons tu fais un test de protéines (.) et là le kit je les acheté (.) j'ai acheté le kit pour dorer
7317 les protéines (.) et on a acheté la machine (.) pour lire le résultat (.) donc je dirais que je
7318 faisais la 50% du boulot
- 7319 20:18 **ok (.) par exemple (.) ton cas est vraJoannet très différent de tous les autres**
- 7320 20:21 Je sais ah depuis le début ((laughter))

- 7321 20:23 ((laughter)) **Parce que là ici il y en a certains qui disent pratiquement tout (.) tout**
7322 **est acheté**
- 7323 20:30 Oui
- 7324 20:28 **il y en a ceux qui disent bon à peu près 90% (.) il y en a ceux qui disent c'est à peu**
7325 **près 80% (.) mais qu'est ce que t'en penses? par rapport au fait que (.) tout est: tout est**
7326 **acheté (.)**
- 7327 20:47 on est dans un labo riche
- 7328 20:48 ((laughter)) **c'est ça? ((laughter))**
- 7329 20:51 ben euff:
- 7330 20:52 **non mais tous les laboratoires font ça aussi ?**
- 7331 20:54 Tu vois les boites de tips? ou tu as les petites pointes là pour les pipettes ((snicker)) et
7332 ben nous on remplissait ça nous mêmes ((elle parle de son laboratoire précédent))
- 7333 21:03 **Ah tu parles de ton PhD là?**
- 7334 21:06 Oui De mon doctorat (.) on les remplissait (.) on avait euh on achetait des grands
7335 sachets (.) de tips parce que ça coûtait moins cher (.) et donc on prenait les tips après les
7336 mettait dans la boîte (.) tu vois ça aussi je fais pas pareil ((laughter))
- 7337
- 7338 **Gaelle 25**
- 7339 23:53 **Ok now in your everyday experJoannets (.) what is the ratio of the operations that**
7340 **are made ready to you by other parties? For example if you think about you now the**
7341 **experJoannets that are on going right now (.) the cells you (.) are purchased the medium**
7342 **is purchased the trypsin is purchased (.) bought the machines do calculations for you**
7343 **(.) what else? Can you think about the different things that you get from outside?**
- 7344 24:26 u::h (.) for example there are some solution that technicians made (.) it's not outside
7345 but it's not uh also that we make it (.) u::h for example for you make some collaboration (.) so

7346 you can send (.) either you send your sample and they will give you the results (.) or you go
7347 to another lab (.) and u::h they will so they will give you the product protocol (.) so you don't
7348 have to::: search for it or to make all the: the how you call it? the the:: mise au point?
7349 25:18 **mise au point?**
7350 25:18 oui
7351 25:19 **What's the word?**
7352 25:22 set up
7353 25:26 **Yeah**
7354 25:28 You don't have to:: to spend time on the set up (.) if it's has already been done in a lab
7355 close to or not
7356
7357 **Cédric 25**
7358 16:32 **ok now if you think about your u:h or before that (.) u::h in your everyday**
7359 **experJoannets if you think about your current research or the past ones**
7360 16:42 yeah
7361 16:42 **what is the ratio of the operations that are made ready to you by other parties?**
7362 **For example the cells are purchased (.) the medium too (.) trypsine is is purchased (.)**
7363 **the machines do calculations for you (.) just think of a:: project and tell me**
7364 **approximately what is the ratio of things that are ready made to you**
7365 17:05 Everything (.) almost
7366 17:08 **ok**
7367 17:09 Then you just make some stuff to lever but (0.4)
7368 17:19 **but what do you think about this situation?**
7369 17:23 what do you mean?

- 7370 17:24 **Of the fact of you know getting everything from outside and you need to trust that**
- 7371 **this company is giving you the right machine (.) this company is [**
- 7372 17:30 Yeah but then it's the same if you buy just the medium you buy the water or you take
- 7373 from your pipe (.) but then your pa you buy the suga:r and you by the amino acids and you do
- 7374 it yourself (.) what I tell you that they don't put anything in the product
- 7375 17:46 **Yes I understand [**
- 7376 17:46 So there is no aim to (.) to really (.) you can go up (.) at a certain point (.) just to buy
- 7377 everything you have to have put in the medium
- 7378 17:57 **uhm**
- 7379 17:56 But that's the higher you can get (.) you're not going to grow the stuff to make
- 7380 18:01 **Yeah I understand that at your level as a research or at the level of the lab it's**
- 7381 **impossible or not really feasible (.) to do everything and even if you can do them (.) you**
- 7382 **can make mistakes even more than other companies this is sure (.) but let's talk in terms**
- 7383 **of (.) theoretically in order to be able to know everything (.) so we don't know how this**
- 7384 **machine was calibrated we don't know what is exactly in this medium we don't know**
- 7385 **but trust (.) we have to trust**
- 7386 18:34 Yeah but the machine you know how it's calibrated (.) you know what's it's supposed to
- 7387 do (.) like you you said u::h the spectrophotometer you know what it's doing (.) you know
- 7388 that when you press the button there is one way from the line that's going through and then
- 7389 you are taking another out
- 7390 18:57 **You know uh how it is calibrated (.) but is it measuring what you want to know?**
- 7391 19:03 Well yeah (.) it can be

7392 **Paul 25**

7393 9:05 u:hm (.) in the everyday experJoannets that you do here what is approximately the
7394 ratio of the operations that are made ready to you by other parties (.) for example the
7395 cells are purchased the medium too (.) the trypsine (.) machines you buy them u:h that
7396 do calculations (.) so basically if you just roughly think about the uh: a project (.) whole
7397 project (.) the different steps and different things dons by other parties (.) how much
7398 percent?

7399 9:45 (0.4) so if if if one PhD student cultures cells here in the lab it's not considered as a third
7400 party you're talking about the the full service that we may ask to company

7401 10:01 so if the PhD student is culturing cells here (.) he or she is needs other cells and
7402 the cells are bought (.) uh you medium the medium is purchased too you need incubator
7403 you need trypsine you need everything so these different things are from outside ready
7404 made

7405 10:20 Yeah well we we we uh we do not u:h we do not generate uh (.) many things (.) I think
7406 that we we are dependent of 95% on on uh external stuff

7407 10:38 and this used to be the case before or (.) it's has always been like that or that's in
7408 the recent years it started to be more and more dependent on other firms?

7409 10:51 (0.4) well it it it is certainly more and more increasing u::h more and more increasing
7410 because with all the limitation you have you have mentioned u:h you may think that a
7411 company for which it is the the job to to prepare to prepare medium u::h according to some
7412 quality control u:h level (.) you may at the end trust them more than you could trust your own
7413 lab in doing this u:h in a very punctual way (.) so yes they are more and more u:h (.) use of
7414 external u:h uh product uh clearly uh I think that from the from the cell to the mice you we
7415 we we are dependent on the on providers but we can also appreciate the professionalism of
7416 these providers so I do not see that as as a real uh weakness in the system

7417 **Question 26:** Can you draw me a diagram showing the different stages or operations of your
7418 current research?

7419

7420 **STEPHAN 26**

7421 6:30 **Ok (.) now I'll ask you to draw me a diagram showing the different stages or**
7422 **operations of your current research mentioning those that are made by yourself and**
7423 **those that are ready made to you ok?**

7424 6:45 Yeah ((laughter))

7425 6:46 ((laughter)) **here is a piece of paper**

7426 6:55 diagram uhmm

7427 6:57 **You don't have to go into the details of your (.) secrets obviously but just to show**
7428 **me the stages and just we need to sketch it to picture it yeah? ((looking for my pen))**
7429 **((pointing at a pen)) I think it's (.) it's there would you take it?**

7430 7:16 the pen?

7431 7:16 **the pen yeah**

7432 7:19 oh yeah I see (.) I didn't see

7433 7:24 **Just give me like the different stages that uh of your research**

7434 7:29 My research

7435 7:30 **you go from one stage to another donc so from one machine to another from one**
7436 **product to another**

7437 7:36 Yeah

7438 7:37 **in your protocol so**

7439 7:38 So for me (.) ((coughing))

7440 7:45 **like boxes (.) boxes**

7441 7:45 boxes?

- 7442 7:46 **Yeah**
- 7443 7:47 So uh so we have for box some like PCR sil so we start with the: (.) to some design of
- 7444 the experJoannet?
- 7445 7:57 **uhum**
- 7446 8:01 **Designing what? is uh**
- 7447 8:02 so this is cell (.) so this is my cell (.) I have to::
- 7448 8:05 **You do it**
- 7449 8:08 an::d from u::h to some extend I ((drawing)) so I design some of the tools?
- 7450 8:28 **uhum**
- 7451 8:27 so are: products
- 7452 8:29 **products?**
- 7453 8:34 So the product I design what it has to be the I send it to the company
- 7454 8:42 **to manufacture them or what?**
- 7455 8:43 company::: yeah ((drawing)) company
- 7456 8:56 **what does the company do?**
- 7457 8:57 u:h so they (.) for example (.) I I I have to call these primers (.) some pieces of DNA and
- 7458 I tell them Ok I want to have number 1 with this order number 2 with DCGC and O
- 7459 9:12 **uhum**
- 7460 9:15 and I give this information to the company and they put these things together
- 7461 9:20 **uhum**
- 7462 9:22 and then they send it back to me
- 7463 9:24 **chromosomes?**
- 7464 9:24 u::h it's it's like pieces of DNA
- 7465 9:28 **DNA ok**
- 7466 9:29 of u::h chemically (.) artificially synthesized DNA

- 7467 9:34 **uhum (0.5) so what do they give you here? back**
- 7468 9:44 So here (.) I get u::h a tube u:h tube with synthesized DNA ((drawing))
- 7469 10:07 **company**
- 7470 10:08 So that's the company
- 7471 10:09 **uhum**
- 7472 10:09 and then I:: other companies they ((keeps writing and started talking to himself))
- 7473 Company:: B there is company A:: company B company C: ((laughter)) so they might be the
- 7474 buffer what I use and the other one is the: a: (.) tubes (.) these I combine and there is another
- 7475 one that u:h (0.4) oh
- 7476 11:01 **company B**
- 7477 11:01 C makes machines u::h combine products u::h oh what a lousy schedule I made
- 7478 11:18 **it's ok I'll add colors later**
- 7479 11:24 I program the machine to do what I want it to do and then I:: (0.5) this is in your
- 7480 ((talking to himself)) combine them (.) machine and the products (.) in machine ((lughing)) so
- 7481 the machine and the products are outside and then uh u:::h the products u::h then I get my
- 7482 (0.6) machine and data output
- 7483 12:35 **company E?**
- 7484 12:35 Yeah this is from (.) I did uh it's another machine from that company
- 7485 12:42 **uhum**
- 7486 12:49 machine (.) data output and:: so I have to analyze data well on the computer
- 7487 ((laughter)) from a company ((laughter))
- 7488 13:03 **((laughter)) a special software?**
- 7489 13:07 u::h yeah (0.4) special software (0.6) a:::nd (.) how to say ((coughing)) and in the
- 7490 whole process (.) so how to say that? (.) there is::: uhm:: to analyze so I have my interpretator
- 7491 (.) and then I can (.) check so I can also in that way it's also you know at least I can check at a

7492 different step there is some way you can check this if this is indeed done correct (.) there is
7493 some ways to (.) check the different performance of the different steps in the whole process
7494 14:30 **where do you place cells here? where do you get the cells from?**
7495 14:35 cells?
7496 14:35 **yeah**
7497 14:36 u::hm let me see (0.5) god ummm
7498 14:46 **you'll add something ((laughter))**
7499 14:46 oh yeah oh I'll add so many things so I have RNA (.) RNA comes from ((laughing))
7500 cells
7501 14:58 **which is the the raw material on which you work?**
7502 15:01 Yeah this is fro::m company make cells from cells from another machine of course
7503 ((laughter)) ((put the pen on the table))
7504 15:21 **ok where do you place the incubator that you use in your research?**
7505 15:26 th::e (.) it's like ((laughing)) it's like a never ending
7506 15:31 **((laughing))**
7507 15:31 it's complicated you need 500 pages (.) cells so cells yeah incubator which is company
7508 based
7509 15:41 **ok (.) and medium**
7510 15:44 medium so you also have medium medium u:h then you have antibiotics and other
7511 (0.5)
7512 16:07 **so it's clearly that 80% is provided (.)**
7513 16:11 oh it's a lot ((laughter))
7514 16:13 **ok now uh how do you account for that? Is business is the market conducting**
7515 **research or it's researchers that are conducting the business? which is more powerful?**

7516 16:35 u::h too::: u:h it's a little bit both ways (.) I think to some extent we have researchers
7517 determine what they want to do and they demand this product and but there is also sometimes
7518 we can see that companies they sell you something but actually they never tested it so you're
7519 then testing it and then you find out ok this really doesn't work and then the company says oh
7520 I'm sorry it didn't work I'll give you money back so actually you did the: quality or the
7521 performance experJoannet for the company

7522

7523 **Daniel 26**

7524 16:15 **now can you draw me a diagram showing the different stages or operations of**
7525 **your research mentioning those that are made by yourself and those that are ready**
7526 **made to you (.) I'll show you a example here of Stephan (.) just just blocks like this (.) so**
7527 **for example you think of your research and step by step and just label it yourself or that**
7528 **somebody else does the job (.) see what I mean? for example you see (.) you put I need**
7529 **cells (.) cells provider one (.) I need a medium (.) to put them in the medium (.) provider**
7530 **two (.) I need to put them in incubator (.) incubator provider three (.) then I need**
7531 **trypsin or whatever (.) so step by step everything you need you put in a box and you**
7532 **say provider one two three can you do that?**

7533 17:05 Yeah I'm not sure I:: understood uh

7534 17:08 **Just think of the the the current operation uh research that you're working on**
7535 **and you know the different steps that you'll**

7536 17:16 Yeah for example I start with cells

7537 17:19 **Ok yes**

7538 17:19 So I write cells?

7539 17:20 **Yeah you write in a box cells and in front of it you put provider (.) if you take**
7540 **them from a provider (.) so you need cells**

- 7541 17:29 Yeah
- 7542 17:30 **ok and then you put provider here**
- 7543 17:34 I just write provider
- 7544 17:36 **Yes provider 1**
- 7545 17:37 ok
- 7546 17:38 **Then what do you do with the cells?**
- 7547 17:42 u::h so culture of the cells
- 7548 17:46 **and culture what do you need?**
- 7549 17:48 So:: trypsine medium
- 7550 17:51 **Yeah**
- 7551 17:53 I put everything in the same box?
- 7552 17:54 **medium is different from the trypsine right? so so you put them in the medium**
- 7553 **first**
- 7554 17:58 uhm
- 7555 17:59 **not all the time so medium and the medium you buy it right?**
- 7556 18:02 Yeah
- 7557 18:04 **From a provider**
- 7558 18:09 So trypsine ((writing down, drawing his diagram))
- 7559 18:16 **and then you need trypsine**
- 7560 18:16 uhm same provider than medium
- 7561 18:19 **ok provid so provider 3 it can be (.) but anyway it's it's it's provided ok not not**
- 7562 **you and then?**
- 7563 18:28 u::h then proteins protein extraction ((drawing)) no provider
- 7564 18:41 **no provider ok**
- 7565 18:45 u::hm it's uhm medium extraction also so no provider uh medium analysis

- 7566 19:12 **how do you do the analysis?**
- 7567 19:16 with uh with a machine so I will
- 7568 19:17 **what? You put the machine here (.) provider and uh**
- 7569 19:20 Provider also?
- 7570 19:21 **So yeah it's a provider right?**
- 7571 19:23 Yeah
- 7572 19:23 **and what kind of machine?**
- 7573 19:26 It's uh to:::: uhmmm
- 7574 19:28 **the name of the machine or something**
- 7575 19:29 Ok (.) CMA
- 7576 19:30 **ok**
- 7577 19:32 (((Still drawing)) So protein extraction (.) protein () dosage (.) so here I need uh a
- 7578 provider
- 7579 19:46 **what kind of provider?**
- 7580 19:48 u::h reagents
- 7581 19:49 **ok so reagents here**
- 7582 19:53 Reagents?
- 7583 19:51 **Yeah provider (.) reagents (.) reagents (.) so provider 3 right?**
- 7584 19:59 u::h yeah so reagents yeah (0.3) ok and u::h western blot (.)
- 7585 20:15 **western blot and you need what? the gels?**
- 7586 20:18 Yeah so provider 4 ((laughter)) (0.4) uh ok (.) and this is a lot
- 7587 20:36 **this is provider 5? right?**
- 7588 20:38 Yeah
- 7589 20:41 **what did you say?**
- 7590 → 20:42 A lot of providers ((laughter)) even in this simple u::h experJoannet

- 7591 20:47 **ok can you keep going?**
- 7592 ↓20:51 u::h ((asking himself)) what are we doing? (0.3) ok we then () on the same scheme?
- 7593 21:00 **whatever enfin sa same research for example then you put them in the: incubator**
- 7594 **you need an incubator we the co2 and someone to**
- 7595 21:11 ok (.) I just
- 7596 21:14 **yeah yeah yeah just not necessarily in the same order**
- 7597 21:19 ok (.) ok so they are quite a lot ((laughter))
- 7598 21:24 **You only now discovered it?**
- 7599 21:27 Yeah (.) u:hm never thought about that but
- 7600 21:31 **ok incubator that's provider 6 what else? what do you do with your uh ok this is**
- 7601 **just the preparation then what do you do with your research later on?**
- 7602 21:43 u::h
- 7603 21:43 You test drugs you do what?
- 7604 21:48 we're doing well also RNA expression of course
- 7605 21:52 **what that you use QPCR?**
- 7606 21:55 Yeah
- 7607 21:56 **so RNA expression you need provider 7 for QPCR**
- 7608 22:02 Yeah (.)
- 7609 22:06 **and QPCR is a very complex machine (.)**
- 7610 22:09 Yeah
- 7611 22:10 **that does the calculations of uh that gives you like**
- 7612 22:14 Yeah so (.) there are several providers but
- 7613 22:17 **what else? after the QPCR**
- 7614 22:22 u::h we have also (0.3) well DNA we are also working on u::h DNA analysis with
- 7615 some kits (.) ((writing))

7616 22:50 **provider 8**

7617 22:56 yeah (.) u:::hhhh () but also with the cells we:: use translation of gene silencing (.) we

7618 need reagents

7619 23:15 **uhum (.) provider 9**

7620 23:26 uhum ((asking himself)) what we are doing? (0.4) Yeah I don't know

7621 23:40 **what**

7622 23:40 of course we have in vivo experJoannets so (.) animals

7623 23:46 **you need animals?**

7624 23:50 ((writinng and whispering)) so for animals we need treatments (0.5) provider 11

7625 24:11 **ok let's stop at this level (.) but uh if for example the cells you need to trust that**

7626 **the provider is giving you cells that are as described?**

7627 24:22 uhum

7628 24:23 **Some times the cells may be have received other docu other medicines or drugs**

7629 **that are not written there (.) may be they are not all the time able to to find this out (.)**

7630 **you have to trust to trust that the cells are as described?**

7631 24:40 uhum yeah

7632 24:40 so (.) it's like black box here (.) take this it's this (.) because the provider said

7633 24:49 u:::h yea:::h they provide some information

7634 24:53 **uhm (.) if whatever they say they have to you have to trust?**

7635 24:57 Yeah sure

7636 24:59 **and u::h the only thing for you is that u::h ok the cells are n are really**

7637 **immortalized so they are working (.) for you as long as they are wo not dying so that's**

7638 **fine the cell**

7639 25:12 Yeah but also we know that the cells can express different proteins so depending on the

7640 tissue:: where they come from or the patient (.) so we can't check some: markers or

7641 25:29 **so (.) but are there are there other conditions that can be in the cells and that**
7642 **cause this u::h this resistance and that you don't know why ?**

7643 25:42 Yeah (.) oh sure we don't know everything so

7644 25:47 **and the medium too you get a readymade medium with a lot of ingredient**

7645 25:52 uh we we prepare uh we just start from powder

7646 25:56 **uhm**

7647 25:56 and then we prepare ourselves

7648 26:00 **but using the ingredients that you get from other uh**

7649 26:03 Yeah yeah

7650 26:04 **which could contain other molecules that you don't know**

7651 26:08 Yeah but it's:: it's also their job to:: to provide u:h

7652 26:13 **yeah but you have to build that (.) you have to trust that the**

7653 26:16 Of course but u:h I hope we can trust otherwise (.) this would change change a lot

7654 26:26 **Same thing for the trypsine? when you use the trypsine from the provider?**

7655 26:28 Yeah

7656 26:30 **it can it contain other molecules?**

7657 26:31 Yeah sure

7658 26:32 **and the providers of these things are usually not many in the world they are (.) big**
7659 **providers that provide this to:**

7660 26:39 Yeah there are different companies but yes

7661 26:42 **let's say five six seven ten companies in the whole world?**

7662 26:45 Yeah

7663 26:47 **and that gives to all labs in the world?**

7664 26:49 Yeah

7665

7666 **Gaelle 26**

7667 25:38 ok (.) now you see diagrams here ((showing her diagrams already produced by
7668 her colleagues)) this is of Stephan and this is of Daniel (.) I want you to draw me a
7669 diagram like this about the different the different stpes that you go through for your
7670 current research (;) you don't go to details (.) just say for example I need cells (.) right?
7671 and you put provider 1 here then I need the medium and you put provider 2 and and
7672 and until the end

7673 26:14 so::

7674 26:18 **Just talk while you are while you are drawing so first thing you need what?**

7675 26:22 So (.) cells

7676 26:24 **cells ok (.) who provides ? provider?**

7677 26:24 They are already in the lab but you can buy the

7678 26:31 **Yeah but but the lab buys them? So provider (.) What is ATCC?**

7679 26:37 It's u::h the website where we you can order american u:h

7680 26:44 **you can order there?**

7681 26:45 Yeah

7682 26:44 **so yeah please put provider 1 then?**

7683 26:54 There are other websi u::h provider

7684 26:59 **Just just provider the next thing you need is what?**

7685 27:02 For one experJoannet for example not for all the

7686 27:05 **For the current project**

7687 27:07 Yes but for one experJoannet? or all

7688 27:10 **ju ju keep going we will see until the end hhhh**

7689 27:15 Like you need to treat them (.)

7690 27:17 **treat them ok (.)**

- 7691 27:19 Treatment (.) so::
- 7692 27:22 **What you need and from where you get?**
- 7693 27:28 u::h from u::h u::h fff many steps it can be::: sigma::
- 7694 27:37 **That's fine just put provider or or from home from your lab**
- 7695 27:43 But for the cells you need also: basically u::h medium
- 7696 27:54 **ok (.) and the medium is from a provider?**
- 7697 27:57 Yeah (.) there is no place ((referring at the page on which she is writing))
- 7698 27:59 **Yeah you can write there**
- 7699 28:02 u::h life tech (.)
- 7700 28:07 **Provider just P or provider yeah**
- 7701 28:14 uh after treatment u::h you::: process
- 7702 28:23 **Process?**
- 7703 28:25 yeah you process them either to collect the proteins (.) RNA or
- 7704 28:31 **So for example the: western blot?**
- 7705 28:33 Yeah
- 7706 28:33 **Blot or ok**
- 7707 28:36 So processing?
- 7708 28:35 **Uhum (0.4) and that for example**
- 7709 28:45 It will u::h
- 7710 28:45 **RNA you need the maxwell machine for example**
- 7711 28:47 Yeah
- 7712 28:49 **so provider**
- 7713 28:51 Provider (.) u::h then you would add the results then it can be::: u::h it can agree with
- 7714 the hypothesis (.) and so you follow the steps
- 7715 29:21 **uhum**

7716 29:24 No you ask why? hhh (.) you look to the literature for example (.) You have other (.)
7717 another (.) either you have an explanation (.) and so there you come back there
7718 29:50 **You do it again using another technique?**
7719 29:53 Again or other techniques or you follow with other treatment or other (.) and:: if you
7720 don't have an explanation (.) you make another experJoannet ()
7721
7722 **Cédric 26**
7723 19:04 **ok (.) can you draw me a diagram like these one for example Daniel's and Stephan**
7724 **and things like this to shoe me like the different steps that you want to go through or**
7725 **another (.) project that you worked on like for example you start with cells for example**
7726 **you? I need cells here**
7727 19:27 Yeah
7728 19:27 **Provider 1 (.) theI need this (.) provider 2 until the end of your project for**
7729 **example**
7730 19:36 Yeah
7731 19:36 **Can you do that?**
7732 19:38 Yeah ok but I I do you want? what you want me? The project?
7733 19:43 **Yeah just the steps (.) you first need cells to work on right?**
7734 19:47 Yeah
7735 19:49 **and this is provided by provider not from here then the next step you need for**
7736 **example for the culture cell culture you need this**
7737 19:57 Yeah
7738 19:58 **Provider 2 then you need this provider 3 something like that**
7739 20:02 Yeah yeah ok but I'm just going to draw a box like you did now
7740 20:06 **Yes yes**

7741 20:09 like you showed me

7742 20:08 **yeah yeah exactly it's ok**

7743 20:11 Yeah but ((laughter)) there is no point if I just do what do just do

7744 20:14 **but yeah but not I mean uh but you name them differently (.) cells here**

7745 20:19 Ah yeah ah you want me to really do it? Ok (.) Yeah I don't know if you want me u::h

7746 (.0;4) you will have (.) ((almost whispering or talking to himself)) the cell here ((sighs)) the

7747 actual cell from and the actual medium

7748 20:52 **provider**

7749 20:52 provider 1 (.) provider (2) that will give me cell and for that of course I need incubator

7750 (.) I need uh

7751 21:05 **Incubator is provider 3**

7752 21:08 yeah I mean the hoo:::d I mean the pipettes: they are recent but that's a matter of (.)

7753 well you have a provider here to give you the material you only need to work so then I need

7754 my my mi::ce so that's that's provider of mice it's called ((name removed)) (.) He will give me

7755 my mice but then with that you have all the:: the material provider so like the cage (.) the

7756 food and everyone of them can be provider it's ((he keeps writing)) and then you do the

7757 experJoannet and here you get also I mean like injection so you need seringue that's provider

7758 then anesthetic (.) ((keeps writing and whispering)) and then the mice are (.) They you have

7759 to follow your experJoannet so like caliper to measure the tumor (.) provided from another

7760 one (.) and so on and then I keep my mice so that's experJoannet 2 and so on (.) it's ok?

7761 22:59 **so how many how many providers in total**

7762 23:04 If I list them all

7763 23:07 **one two three four**

7764 23:05 But that that is I didn't counted everything but the cells the cells one the medium two

7765 the incubator the hood five the tips paper (.) I mean of you want to count there is

- 7766 23:20 **so**
- 7767 23:20 everything is coming from different stuff
- 7768 23:24 **everything?**
- 7769 23:25 Yeah everything
- 7770
- 7771 **JOANNE 26**
- 7772 19:04 **Ok I'd like you to draw me a diagram showing the the project on which you're**
- 7773 **working (.) right now (.) like this diagram of Stephan this is of Daniel and this is of**
- 7774 **Gaelle something that shows the different steps yougo through (.) so you're working**
- 7775 **with a with Brian on a project so for example first thing you need the cells right?**
- 7776 19:29 uhm
- 7777 19:30 **so you put cells (.) and you put I need provider for the cells (.) then the next thing**
- 7778 **what you need (.) just I want to know what is from a provider and what is from you (.)**
- 7779 **that's all what want to know (.) the different steps (.) and then for different steps (.) this**
- 7780 **is provided or from who? in house or from provider**
- 7781 19:54 everything is provided ((laughter))
- 7782 19:59 **ok you start from cells**
- 7783 20:03 Yes cells like uh you'll get
- 7784 20:04 **what is this? this is cells?**
- 7785 20:06 yes and this is uh ab:reviation ((laughter))
- 7786 20:09 **symbol? ok ok**
- 7787 20:11 ok then
- 7788 20:13 **then provider**
- 7789 20:17 So I have to write every time provider
- 7790 20:18 **If there is a provider (.) then what do you need?**

- 7791 20:22 Medium ((writing))
- 7792 20:25 **ok**
- 7793 20:26 providerhhh ((laughing)) (0.4) so:: to do like experJoannets reagents
- 7794 20:38 **uhum reagents**
- 7795 20:43 Yeah provider also is that what you mean?
- 7796 20:47 **yes**
- 7797 20:49 so everything we use reagent on so everything is provided
- 7798 20:51 **what is reagent? it's a solution?**
- 7799 20:56 yes
- 7800 20:56 **a molecule?**
- 7801 20:58 Yes
- 7802 21:00 **to put on the cancer cells to test them?**
- 7803 21:01 so:: for:: like for example (.) if I want to use western blot I will need andtibodies (.)
- 7804 antibodies you'll buy them
- 7805 21:14 **ok**
- 7806 21:15 if you want to you amino fluorescence you need antibodes (.) antibodies we buy them
- 7807 hhh ((laughing))
- 7808 21:20 **ok (.) just keep going (.) think about your own current research just current**
- 7809 **research**
- 7810 21:26 I mean (.) you mean my step what I do? Like exactly for
- 7811 21:29 **Yeah yeah just keep going the whole diagram so you'll use then what? Then you**
- 7812 **need a machine to te**
- 7813 21:36 Yes
- 7814 21:38 **What kind of machine is this?**
- 7815 21:42 What what kind of machine?

- 7816 21:42 **what's the name of the machine you're thinking about here?**
- 7817 21:45 So:: so you have the microscope for example
- 7818 21:49 **uhum (.) and that's provided**
- 7819 21:53 Yes (.) you don't think uh you'll buy it
- 7820 21:58 **yeah (.) then what?**
- 7821 22:03 Uhum (.) all type of machines like (.) we don't u:h
- 7822 22:10 **just go how how in the logic that you're doing your research**
- 7823 22:17 ok so western blots and materials ((while writing)) ((laughing)) like the same thing
- 7824 here?
- 7825 22:31 **everything is just provided you mean?**
- 7826 22:34 Yes (.) even when you meake solutions here (.) like there is part of the solution with
- 7827 provider (.) u::h
- 7828 22:45 **so how man how much percent? What is the ratio? of the provider's you know**
- 7829 **interference into your work ?**
- 7830 22:54 uhum (.) You can say 90% (.) 95%
- 7831 23:00 **ok now can you write it down there?**
- 7832 23:02 May be 80% 90? may be more I don't know
- 7833 23:04 **Just keep going until the end of the (.) until the end when you finish the:**
- 7834 23:13 Everything is provided ((laughter)) really even when you make a reagent here (.) like
- 7835 when you things together (.) what you use is things that you bought from outside
- 7836 23:25 **and for (.) and and you have to trust that it's correct? everything?**
- 7837 23:29 Yes
- 7838 23:30 **so 95% of things that you: consume are already provided from elsewhere (.) and**
- 7839 **you need to trust that they are correct (.) If they are not correct that would be serious**
- 7840 23:45 yes.

7841 **Question 27:** How do you account for the condition of depending on other parties?

7842

7843 **STEPHAN 27**

7844 17:17 **uh ok how do you account for that? or this fact or this way of doing research**
7845 **being you know dependent upon so many factors and some many external parties?**

7846 17:31 No it's again crazy it's so many parameters for things that can go wrong but it's (.) I
7847 think it's one of the only ways because you cannot control (.) you have no time effort options
7848 to get all these materials you cannot create them yourself

7849 17:50 **this is if this logic that you're going through is true (.) may be there are many**
7850 **things that are really should not at all go through this (.) may be research has to be**
7851 **really basic and not to that extend complicated and it's the business of companies that is**
7852 **creating this need and making things seem to be really really important u:h**

7853 18:14 Well I didn't hold on (.) that companies are making this complicated so they make
7854 money out of that?

7855 18:25 **you you based your your your decision on the fact that you need to go through all**
7856 **these stages**

7857 18:34 Ye:::s

7858 18:35 **and this need where did it start? it started from a logical thinking and then you**
7859 **found out that you have to go through that? or because there is an influence of the**
7860 **products that are available in the market that**

7861 18:49 Oh I think I know for a big part oh pretty much uh for a big part as I can see it's really
7862 logical thinking because I know (.) what I have to do once I plug the intrinsic steps required
7863 to go from cells to RNA and (.) I know the methods (.) how to use (.) I know like the the
7864 physical property the chemical property and so on (.) and I could make it myself the:::
7865 machine myself a little bit but it takes a crazy long time and I would spend my time making

7866 the tool instead of doing the actual experJoannet (.) so for me to save my time and to be able
7867 to invest it on the actual study what I want it to do (.) I outsource my efforts to make the tools
7868 by the companies (.) so this is uh instead of wasting may be a year now I can just uh in a half
7869 a day take this take that from a company and I start

7870 20:03 **ok (.) but these machines too (.) these products that you buy are also the products**
7871 **or the consequences of research that showed that these are important and research too**
7872 **we were talking the journals and how the (.) how they publish and how they**

7873 20:26 Yeah some of the products so they're are indeed not exactly uh what what they
7874 promoted to be and they are just piece of crap and they try to sell it but you have to: learn to
7875 find out with your own experience like which product do I believe which product I do I not
7876 believe and which product is necessary and what is not and sometimes (.) sometimes they
7877 come of it crazy products and I think that's useless

7878 20:57 **so if you're using 80% of products that are readymade and not yours (.) to what**
7879 **extend you can check your your work? how how would you know that the error is here**
7880 **or there ? how if it's too compli**

7881 21:12 it's well you have yourself what you have for example you think you studied a
7882 mechanism identified then to some extend you can u::h what you find in vitro if you want to
7883 study in vivo well in vivo it's a different source u::h it's not the same (.) I think it's may be as
7884 you would be: like not the same possible source

7885 21:40 **if you don't go to in vivo?**

7886 21:43 Well then you have to ((laughing)) ((coughing)) you have to try to validate it with
7887 multiple methods at least (.) then of course yeah you have the risk like if you had it from one
7888 original cell source for example and you just study the same cells maybe it's intrinsic to the
7889 cells and then uh later you end up with results that's only valid for those cell type

7890 22:07 **Ok I'll put it (.) my question is really different way now do you think that**
7891 **experJoannetal sciences and biology in particular need to go into rigorous logical**
7892 **thinking much more than all the time trying trying trying things?**

7893 22:23 u::h yeah you need a lot of thinking otherwise you just uh run around you have passed
7894 it

7895 22:29 **if you think a lot (.) before you ever start the experJoannet (.) that would save you**
7896 **time and money?**

7897 22:36 ↑ oh yes (.) yeah and sometimes in u:h a day spent uh behind the computer you have a
7898 week saved in the run

7899

7900 **Daniel 27**

7901 26:52 **Ok what do you think about this idea condition?**

7902 26:56 No for me it's (.) it's fine because u:h (.) they gi:ve they give us information about the
7903 product we:: we want to buy so (.) we know (.) we know what we're buying so

7904 27:14 **You know based on what they say?**

7905 27:17 ((laughter)) yeah but we cannot for everything

7906 27:19 **we cannot no for sure we cannot (.) that's the only uh (.) you as a person as a**
7907 **researcher you cannot go over everything and check how it was fabricated yourself**

7908 27:29 Yeah

7909 27:30 **that's for sure**

7910 27:32 In this companies there are: a lot of steps also to check purity quality of the products
7911 so

7912 27:39 **but you as a researcher (.) you're doing your research you're building on a**
7913 **number of things that are already made available to you and at some level I understand**
7914 **you can't do these things but you have to trust (.) but at the end you as a researcher (.)**

- 7915 **you're not building everything blok by block in front of your eyes? you don't see**
7916 **everything**
- 7917 28:04 uhum
- 7918 28:04 **you have to trust?**
- 7919 28:06 Yeah (.) yeah for me it's (.) for me it's not a problem to:
- 7920 28:13 **It's not a problem because you can't do otherwise? because you as a person you**
7921 **cannot do all that (.)**
- 7922 28:17 Uhm
- 7923 28:18 **But it's a problem because if uh you're doing research and things really are not**
7924 **under your control (.) you're not 100% sure that these things are correct**
- 7925 28:31 yeah yeah yeah (.) uh:: I understand your point but u::h (0.3) yeah (.) I know we are:
7926 asking to professionals so:: normally they should provide uh
- 7927 28:50 **ok normally ((laughter)) may be they're not**
- 7928 28:52 Maybe they're not yeah
- 7929
- 7930 **Dilara 27**
- 7931 21:22 **D'accord mais maintenant par rapport au fait que que tout est acheté euh (.)**
- 7932 21:26 Mais tu maîtrises moins de choses (.) tu (.) c'est du prêt à l'emploi (.) et donc tu
7933 maîtrises moins (.)
- 7934 21:35 **et le risque de de**
- 7935 21:37 ((sigh)) tu fin quand je dis tu maîtrises moins (.) ça dépend en fait parce que parfois
7936 c'est mieux maîtrisé quand tu achètes toi même (.) quand tu achètes tout fait (.) parce que eux
7937 ils vont vérifier les vérifications qui sont faites alors que (0.3)
- 7938 21:50 **Tout ça en se basant (.) en disant que (.) fin les autres ne trichent pas (.) que il n' y**
7939 **a pas d'intérêt pourquoi il s doivent tricher (.)**

7940 21:59 oui

7941 21:59 **Oui ja si jamais (.) si jamais tu avais la possibilité de tout de tout vérifier bien sûr**

7942 **c'est c'est mieux non?**

7943 22:07 Oui mais par exemple (.) imaginons dans le milieu que j'utilisais je devais mélanger (.)

7944 quatre constituants (.) si un jour pendant la préparation de mon milieu quelqu'un vient me

7945 parler (.) je suis distraite (.) j'oublie de mettre un (.) et ben il n' y a jamais personne qui va

7946 aller vérifier ça (.) alors que si tu achètes ton milieu qui est tout fait (.) eux ils sont le

7947 département qualité (.) et il y a des vérifications qui sont faites

7948 22:31 **non non c'est claire au niveau de::**

7949 22:32 Et donc je pense (.) que quand tu achètes des choses toutes faites (.) c'est beaucoup plus

7950 euh (.) tu gères mieux les choses (.) parce que c'est standardisé

7951 22:41 **oui oui (.) c'est tout à fait clair et:: au niveau du chercheur c'est clair on ne peut**

7952 **peut pas faire autrement (.) il n ' y a pas d'autres solutions (.) mais quand on parle par**

7953 **rapport à la recherche en général pour le bien de la recherche (.) s'il se passe quelque**

7954 **chose chez ces industriels là (.) s'il y a un intérêt quelconque pour tricher pour leur (.)**

7955 **pour vendre du produit (.) pour euh t'obliger à toujours consommer ça pour (.) il peut**

7956 **se passer plein de choses (.) quelle catastrophe peut être causée? En sachant que ces**

7957 **industriels ne sont pas enfin il y a des des gigantesques firmes qui qui contrôlent tout**

7958 **dans ce domaine là en terme de consommables pharmaceutiques et cetera (.) le fait**

7959 **qu'on dépend d'eux on dépend d'eux**

7960 23:37 Oui on dépend d'eux ((sighs)) ((laughter)) ah oui on dépend d'eux oui (.) oui fin (.) oui

7961 c'est vrai comme l'exemple du cheval là (.) s'ils veulent mettre du fructose à la place du

7962 glucose (.) on en saurait rien (.) mais::: pff est ce qu'il y aura une conséquence? Je sais pas

7963 23:58 La je te je te cite par exemple un petit exemple que Paul m'a cité l'autre jour
7964 quand euh on était en train de parler de pourquoi 5% de co2 ? Fin personne n'a su
7965 répondre à cette question (.)

7966 24:14 oui

7967 24:14 tout le monde a dit que ça a un rapport avec le pH ça c'est clair et cetera (.) mais
7968 finalement tu demandes aux gens d'où d'où ça vient cette pratique (.) personne ne sait
7969 (.) est ce qu'il y a un journal (.) est ce qu'il y a un article? mais ça a commencé quand?
7970 Paul était le seul à avoir dit ça il y a peu près 50 ans (.) où est ce que ça a commencé? il
7971 sait pas dire (.) après une grande réflexion (.) il était le seul à dire que (.) enfin aussi je
7972 lui ai dit que toi tu a travaillé à 10% (.) il a a ben oui avant on pouvait faire ça (.) alors
7973 que au départ il a dit que c'était pas possible c'était pas possible (.) à 5% il faut 5% (.)
7974 pourquoi? parce que c'est impossible c'est pour l'équilibre et cetera (.) mais ça a été
7975 possible au moins pour le cas de ta recherche et cetera (.) après une grande réflexion (.)
7976 il a dit que les 5% sont nécessaires pour le milieu qu'on achète donc finalement
7977 ça était dicté par le milieu qu'on achète qui est he said "dictated by" textau "ditated by
7978 the medium that is available commercially" donc c'est le milieu qui est disponible dans
7979 le commerce qui fait que nous avons besoin de régler l'incubateur à 5% et ça il va y
7980 avoir d'autre conséquences sur le fait que pourquoi 5% puisque dans le corps il n' y a
7981 pas 5%?

7982 25:44 Oui et non parce que c'est quand même on peut arriver au même résultat

7983 25:50 Pour standardiser tu parles?

7984 25:52 Tu vois c'est euh (.) ben oui et non (.) tu vois t'achètes euh chai pas euh une goutte de
7985 porc mais voilà sur euh (.) c'est pas vraJoannet le bon exemple je sais pas (.) la la tarte (.) une
7986 tarte c'est écrit voilà pour cuire ta tarte (.) tu dois la mettre 20 minutes à 230 degrés (.) c'est

- 7987 pour la cuire (.) c'est pour atteindre un résultat (.) ici si on met 5% de co2 (.) c'est pour
7988 atteindre un certain pH (.) parce que le milieu a une certaine composition
7989 26:20 **de ce pH de ce milieu**
7990 26:21 de ce milieu oui
7991 26:23 **oui mais après ok on atteint**
7992 26:25 Maintenant si tu prends un autre milieu (.) peut être tu auras besoin de 10% mais pour
7993 atteindre le même résultat pour atteindre ce même pH
7994 26:34 **non non non mais indépendamment du pH maintenant (.) le 5% de co2 peut avoir**
7995 **un effet négatif sur le ça pose un biais sur les cellules puisque dans le coeur humain (.)**
7996 **c'était la question**
7997 26:47 oui oui oui (.)
7998 26:52 **en fin pour ne pas sortir de la question**
7999 26:54 Oui parce que ((elle regarde la montre)) ((laughter))
8000 26:55 **Qu'est ce qui reste 10 minutes? 5 minutes**
8001 26:56 Oui il faut que je parte à 5h
8002 26:57 **avant avant 5h on va partir (.) don donc pour revenir à la question (.) donc tout**
8003 **est acheté?**
8004 27:03 oui (.) en fin presque tout
8005 27:05 **presque tout est acheté?**
8006 27:08 Oui
8007 27:08 **et donc ça on doit dépendre des autres?**
8008 27:12 oui mais bon on est pas::: on est pas agriculteur (.) on est pas capable de produire des
8009 choses fin c'est le (.) tout le monde dépend d'autres personnes (.) tout le monde (.) c'est pas
8010 grave

- 8011 27:24 **on te ça dépend (.) on dépend des autres (.) mais aussi c'est black box ce qu'on**
8012 **nous achète (.) on ne sait pas comment ça se se fabrique**
- 8013 27:34 Si uh on peut demander pour aller pour aller visiter et cetera fin (.) dire c'est pas il faut
8014 pas voir les firmes comme quelque chose de fermé fin c'est pas quelque chose de:: (.) c'est
8015 des gens qui sont accessibles (.) ils veulent bien te donner (.) si tu leur demandes de faire un
8016 test supplémentaire il faut un test supplémentaire (.) fin c'est euh il y a moyen de discuter
8017 avec ces gens (.) tu vois si t'as des résultats un peu un peu bizarre (.) puisque j'en ai eu (.) j'ai
8018 eu plein de truc bizarre (.) eh ben j'étais en contact avec eux ils m'ont conseillé tu peux faire
8019 ça comme test renvoyez nous on va essayer avec un autre mode on a eu ça comme résultat et
8020 vous? Et donc finalement (.) et je suis toujours sur mon idée de base que: les gens en général
8021 sont de bonnes compositions ((laughter))
- 8022 28:16 ((laughter)) **et ça a résolu ton problème quand**
- 8023 28:19 oui (.) mais oui oui oui oui dieu merci j'ai pu terminer ma thèse ((laughter))
- 8024 28:25 ((laughter))
- 8025 28:25 oui
- 8026
- 8027 **Gaelle 27**
- 8028 30:09 **and all all the time using you know those uh (.) do you think that you are using a**
8029 **lot of providers many things are ready made to you?**
- 8030 30:20 Yes (.) we do the::: without the: company we can't do a lot of things
- 8031 30:30 **uhm (.) but how do people used to do in the past before these companies**
8032 **developed these new products?**
- 8033 30:38 They have to::: they need u::h at least the product in the
- 8034 30:49 **Ok (.) so you need to trust other companies? Without trust**

8035 30:51 Yeah but they have quality u::h quality test and quality u::h they have good
8036 manufacturing procedures ((laughter)).

8037

8038 **Cédric 27**

8039 23:26 **what do you think about this situation?**

8040 23:29 For me it's (.) can be a good thing like the medium (.) it's a really good thing (.)

8041 because that means that everyone in u::h the world (.) can use the same media that you are

8042 using (.) because if they just buy from the same provider then you buy it from (.) then they

8043 are sure they get the same (.) the same medium that you are getting

8044 23:51 **why do you think it's a good idea to have the same the same medium everywhere**

8045 **in the world? what's the point?**

8046 23:58 So you can replicate the experJoannet

8047 24:02 **So the only thing is to replicate it? If if if there is something wrong here (.) and**

8048 **you want everyone to use it in the wrong way? Why not make different things and test if**

8049 **it's not the same thing then you would say waou what's wrong? why it's working here**

8050 **and not working there?**

8051 24:20 Yeah but some people use different media and some not not not agree why he's using

8052 media from ((company name)) some people are making their own and some people are

8053 24:29 **and it's good?**

8054 24:32 It's also good (.) but the thing is that is good if you do the experJoannet you know it's

8055 working (.) and someone else wants to redo it someone else then can just use your protocols

8056 so just buy the same stuff and we do it on

8057 24:44 **who someone? anyone anyone like you?**

8058 24:47 Yeah I don't know I'm doing an experJoannet tomorrow (.) u::h I want I want to redo
8059 an experJoannet that's already been done (.) in another lab I just buy the same product if I
8060 know that their experJoannet work there is not point doesn't work

8061 25:03 **So what is better to use in another lab to do it in another lab in a different**
8062 **condition like (.) if you find a difference what's the point? why it's a problem? if you do**
8063 **use a different uh medium there when you are replicating and you find a difference is it**
8064 **a problem?**

8065 25:23 No but if you want to especially find it different because you changed the medium (.)
8066 it's just that if you use the same medium (.) you pretty sure that'll have the same u:h starting
8067 point in every labs

8068

8069

8070 **JOANNE 27**

8071 23:45 **But you trust that they are should be fine because they're professional and**
8072 **controlled**

8073 23:51 Yes it should be like that it's not a game (.) there is many labs ((laughter)) in the world
8074 like (.)

8075 23:58 **ok (.) and u:h don't you think that you are kind (.) is it (.) you are conducting the**
8076 **research or the providers conducting the research?**

8077 24:15 If they don't give us what we want (.) we will stop (.) you see?

8078 24:19 **uhm (.) so there is no other ways to do research without providers?**

8079 24:28 Well I don't know for my case but (.) I think uh you can't (.) you should have people
8080 who will make those things (.) and then provide to you (.) everyone has a special uh job like
8081 (.) chemist people (.) we do the who the reagents stuff like that (.) companies (.) they will sell
8082 it to you to tht labs (.) and you you'll use it for your experJoannets (.) if they don't sell you::

8083 like (.) if they don't give you those things you'll not be able to continue the research (.) and
8084 you're not able to do those u::h those stuff (.) like sometimes they use uh (.) ↑ like there is a
8085 secret in the in the produce they sell (.) they don't give all everything (.) how they make it (.)
8086 so they can't

8087 25:15 **oh (.) there is a secret so you don't even know how it works?**

8088 25:19 ↑ It's not you don't know how it works (.) you know how it works (.) but ((sighs)) like
8089 that if they give you all everything like how they make it (.) so you will be able to make it too
8090 (.) so (.) they won't sell it anymore (.)

8091 25:34 **It's a black box**

8092 25:37 yes it's (.) I think it's like that

8093 25:40 **do you think**

8094 25:40 For example the machine will they tell you how they made how they made the
8095 machine? no

8096 25:45 **No it's not necessarily about telling you how they make them (.) but [**

8097 25:49 [you know how it works

8098 25:49 = **you want to make sure that they are measuring what you want to measure (.)**
8099 **that they're in fact (.) measuring for example protein concentration (.) ok I see the chart**
8100 **is going up and down and every time I do the experJoannets I check it's consistent (.) so**
8101 **all the time it's correct (.) it's not bizarre (.) but this rise this rise is it really the rise of**
8102 **the protein concentration?**

8103 26:20 Yes because this uh (.) the reagent is like inter like interfering with the proteins not
8104 with something else you see? To show the:: proteins concentration

8105

8106 **Question 28:** Do you think that cancer research labs need to open up and involve other
8107 specialties?

8108 **STEPHAN 28**

8109 22:49 **ok (.) uhm do you think that cancer research labs today need to open up and**
8110 **involve different people from different backgrounds together [**

8111 23:01 I think they should do more yeah

8112 23:03 **= or there is no need for that?**

8113 23:04 Oh there is a BIG need of that

8114 23:07 **ok (.) like for example biologists along with epidemiologists medical doctors**
8115 **psychologists sociologists and nutritionists?**

8116 23:15 Yeah it' important because (.) it depends also a little bit on the topic and uh the field of
8117 your study but I agree to the idea that more different inputs to make it u:h

8118 23:29 **I (.) one of your colleagues the other day said no no no at this level you don't**
8119 **because we are only on cells and uh later on when we test toxicity or whatever then you'**
8120 **go through doctors and you go through whatever but at this level no we just biology**

8121 23:46 No that's for I think for (.) to some degree ok (.) but it's (.) one of the things for
8122 example if you have no like ok (.) I've done a compound screen (.) and you think like ok I
8123 want to study this (.) before you (.) maybe if I did much experJoannets you thought ok it
8124 works for this model (.) I want to do it further (.) you might have the problem that this
8125 compound is really toxic and things but you don't maybe have the expertise (.) so maybe it
8126 will also already good to: (.) have some content with uh I don't know () doctor or somebody
8127 in medic (.) or who can see about this toxicity (.) give you feedback like (.) this one is
8128 probably not going to be a problem (.) or they say no that really is u::h likely going to kill you
8129 because then you can say ok (.) may it works in here but (.) I can save myself the trouble
8130 because it's not worth studying anyway because we cannot put it into practice (.) because it
8131 will be stopped half the process later

8132 24:52 **you mean this would prevent you (.) saves you time?**

8133 24:55 I think it would save you time yeah (.) may be you don't get what you want to hear but

8134 I do myself save time in studying something it doesn't lead to anything anyway because it's

8135 u::h going to be toxic

8136 25:09 **ok (.) is this related to::: uh the idea of (.) the need to have a logical rigorous and**

8137 **systematic thinking about every single step before you go through the research and**

8138 **keep trying trying trying trying**

8139 25:24 oh I think it's not just before but it's also in the whole process (.) sometimes I think like

8140 when you work on something (.) sometimes it's also good to:: for stop a moment and think

8141 like ok where are we where we started what we got now (.) it's that something here that we

8142 should a:sk and get advised from outside people may be that we don't have expertise on (.)

8143 sometimes you can u::h you can't see things (.) I've also seen many people in here working on

8144 things but just by chance I saw them working on something I was like I think your approach

8145 is wrong you seem to be doing this and this and this but you're also doing it wrong (.) you

8146 you you're wasting your time (.) that's it's because my bio (.) if I've a biotechnology

8147 background and very different than (.) while people here are like from pharmacy or they don't

8148 have some of my uh (.) experience

8149

8150 **Daniel 28**

8151 28:54 **ok (.) do you think that cancer research labs today (.) need to open up and involve**

8152 **people from different backgrounds together (.) or there is no need for that at this level?**

8153 **When I say different backgrounds for example you need biologists epidemiologists**

8154 **medical doctors psychologists sociologists nutritionists working at the same lab**

8155 29:15 Yeah yeah (.) yeah it will be nice (.) because u:h as (.) as we said at the beginning

8156 cancer is very complex (.) so there are different approach to:: (.) to fight cancer (.) yeah if we

8157 can get uh ideas from clinicians (.) epidemiologists and all these people working together it
8158 will be uh (.) it will be better (.) not necessarily in the same lab but (.) make kind of
8159 collaboration and I don't know every:: two three months having a discussion all together (.)
8160 I'm not sure that u::h every day we need uh necessarily to (.) to discuss always it u::h
8161 30:14 **ok not necessarily discuss everyday but to be all the time around different people**
8162 **(.) because every single step may may play a role right?**
8163 30:25 yeah
8164 30:26 **so for example (.) if you want to work on the: incubator and you know that a**
8165 **physician medical doctor know better about level of co2 in the body (.) may be at the**
8166 **time you're designing your research you say ok may be for this research because I'm**
8167 **working on colon cancer (.) may be the medical doctor would tell me**
8168 30:50 yeah we can ask yeah
8169 30:51 **so you don't wait until you publish or until you (.) right?**
8170 30:55 Yeah
8171 30:55 **so for e (.) this is just my example (.) but I don't know how many examples that**
8172 **come up every day in your mind and you'd say what happens in the human body you**
8173 **need a doctor in front of you (.) a medical doctor in front of you may be**
8174 31:11 But I would say that already in the lab we have some doctors so we can u:h we can
8175 already discuss about theses points (.) so it's already u:h kind of av advantage (.) so for us
8176 31:22 **this is by coin by chance that Lucie right?**
8177 31:25 Yeah
8178 31:26 **because she's doing uh another PhD and she is**
8179 31:28 Yeah yeah so in our team there was Nairi who now left but who was also doctor so
8180 31:37 **so this is just by chance because this is a pole of cardiologists and cancer**
8181 **researchers at the same time**

8182 31:45 Yeah

8183 **Dilara 28**

8184 28:28 **ok maintenant en terme de: diversité do you think that cancer research labs today**
8185 **need to open up an involve different people from different backgrounds together? for**
8186 **example uh biologists epidemiologists medical doctors psychologists sociologists**

8187 28:45 Oui c'est sur (.) oui on a pas tous le même bagage de connaissances (.) et en plus de ça
8188 on a pas la même vision des choses (.) et donc c'est important la pluridisciplinarité

8189 28:58 **et pourquoi on ne le fait pas toujours?**

8190 28:58 Parce que ici (.) là ici que des gens dans le même (.) que des gens que des scientifiques
8191 mais euh genre mon compagnon il a fait son doctorat dans un laboratoire ici sur le site (.) et à
8192 la base il est ingénieur civil informaticien (.) alors que c'est quand même un milieu (.) il a
8193 travaillé dans un laboratoire (;) euh d'oncologie aussi (.)

8194 29:21 **mais pourquoi on ne on ne réfléchit toujours pas sérieusement par rapport à cette**
8195 **diversité? Pourquoi on ne voit pas ces tous ces gens là réunis tous ensemble dans une**
8196 **même recherche? Un grand projet euh**

8197 29:33 oui moi pff moi la vision que j'ai je pense que la pluridisciplinarité c'est quelque chose
8198 de bien (.) mais maintenant je pense que tout le monde ne pense pas comme moi et (.) parce
8199 qu'il y a une époque où à en Belgique ils avaient proposé de rassembler à un même endroit (.)
8200 toutes les facs (.) genre toutes les facs de droits toutes les facs de médecines tout (.) pour
8201 justement avoir tous les gens tous les experts à un seul endroit pour que les experts puissent
8202 interagir ensemble et finalement c'est aussi une bonne chose (.) et donc je pense que (.) les les
8203 deux options se valent fin c'est pas ça (.) donc je sais je sais pas je sais pas pourquoi les gens
8204 ne le font pas à part ceux le genre ceux dans le milieu donc je sais pas

8205

8206

8207 **Gaelle 28**

8208 31:09 **Ok (.) Do you need that cancer research labs today need to open up and involve**
8209 **different people from different backgrounds together? Or there is no need for that? For**
8210 **example if you think of biologists working with epidemiologists medical doctors**
8211 **psychologists sociologists maybe nutritionists all together (.)**

8212 31:38 Yes it's important and more important to have contact with clinical u::h direct clinical
8213 u::h () to see what are the new what's applicable or not u::h what is already used in the
8214 clinic (.) for example

8215 32:08 **ok**

8216 32:08 And may be they know u:h more also on the:: physiology of the::: for example u:h of
8217 the body so they they know for example if in the basic condition if it's uh like this or not in
8218 the cancer for example we are not really aware of the:: for example the:: the different stages
8219 so it's important also to know what is u::h

8220 32:41 **How it develops in the body**

8221 32:42 Yeah

8222 32:43 **But why it's not the case? I mean up to now the labs are not like u::h**

8223 32:48 It's more and more (.) It's di they are around this program so they're trying to interact
8224 more with the clinics and so on

8225 **Paul 28**

8226 12:01 **Do you think that cancer research labs today need to open up and involve**
8227 **different people from different backgrounds together? uh for example biologists work**
8228 **along with epidemiologists (.) medical doctors may be psychologists nutritionists and**

8229 12:21 Yes at least this is the: is the (.) the multidisciplinary uh uh approach which is certainly
8230 uh the one to go if work with chemists if we work with engineers is because we cannot
8231 handle the job ourselves and that we uh u:h we learn from them and they learn from us u:h
8232 the chemist can design the best anticancer drug uh if he doesn't think that's the drug has to
8233 enter the cell and if it's uh too big or too polarize will not enter the cells it will it's uh with
8234 less effort to uh to invest time in that (.) when they come here in the lab they realize that their
8235 drug can be ok nice in the paper but then in the real life it has to enter the cell and that issue
8236 change something the structure in order to promote that so we discovered that with
8237 experience that uh that by simply talking and having the: the biologist being in the chemistry
8238 lab or the chemist being in the in the biology lab we realized that there are uh parameters that
8239 we do not integrate in our daily research but that we should do (0.3) when we try to work
8240 with a big file big informatic files on excel files in order to extract some data from huge uh
8241 uh huge data sets u:h it's uh u:h it can be quite uh quite difficult if you work with a lab of
8242 bioengineer or let's say even engineer they will help you not only to enter your data in a
8243 better way but to extract more relevant data from from these big data set (.) uh because they
8244 have the instruments they have the: the machines uh to to to decrypt the data so yes definitely
8245 we need to have more more larger mixture of of person in the lab (.) either physically but also
8246 uh may be uh through collaborations I mean you you if the collaborations are facilitated (.)
8247 I've no problem of uh of uh the people being uh contacted but not being here physically
8248 present in the lab I think it's sometimes but people think about (.) which is too much to to
8249 imagine having uh all people together in the same building (.) ok it helps if you have only to

8250 go once one floor below but but uh to work on the on the way to connect people even though
8251 they are not physically nearby I think that this is something which could be more easily
8252 reached and easily reached

8253

8254 **Cédric 28**

8255 25:39 **ok you consider that to be basic that should not be discussed and u::h change**

8256 **because you want to work on other on other things (.) Now do you think that**

8257 **cancer research labs today need to open up and involve different people from different**

8258 **backgrounds together (.) or there is no need for that at this level? If you think of**

8259 **biologists working in the lab with epidemiologists medical doctors psychologists**

8260 **nutritionists**

8261 26:11 yeah it's already: what we are doing here (.) are different type of people biochemists

8262 working with chemists working with pharmacists and there is doctor and (.) ()

8263 26:23 **but are we really doing it here in terms of working on the same project? or**

8264 **everyone is doing his project may be: looking at one's colleague doing a presentation**

8265 **giving some comments from time to time but**

8266 26:36 No no yeah we have collaboration like (.) for example in one of the projects of:: Brian

8267 and Paul they are working on one compound the compound have u::h () by chemists and

8268 there is a lab here (.) and they are doing some () in vivo experJoannets other people are doing

8269 the physical experJoannet on the molecule and so on

8270 26:56 **so it's u::h it's well done now it's already?**

8271 27:00 It's already done in some part of the lab (.) also in project you cannot always do that for

8272 everything but

8273 27:07 **So for the time being it's good it's good it's working well like that? right?**

8274 27:13 Yeah

8275 **JOANNE 28**

8276 26:35 **ok now do you think that cancer research labs today need to open up (.) and**
8277 **involve different people from backgrounds together (.)**

8278 26:46 Yes

8279 26:47 = **or there is no need for that? For example biologists epidemiologists medical**
8280 **doctors psychologist sociologists nutritionists all together? O just you know you can just**
8281 **read about others contributions?**

8282 27:02 Not it's good to hear from them directly

8283 27:05 **it's good?**

8284 27:05 yes it's good to:: to have a direct contact than to uh (.) to have papers (.) ok you can
8285 read everything but sometimes you want to really understand and you have a specialist on
8286 that stuff who would really explain it to you in a very nice way (.) so I think it's a good thing
8287 to have uh (.) to have those kind of people (.) to communicate with uh people of the lab
8288

8289 **Question 29:** Why do you need to study cancer at the cell level first?

8290

8291 **STEPHAN 29**

8292 26:21 **ok why does cancer have to be studied first at the biologist level? what at the cells**
8293 **level ?**

8294 26:29 Uhm:: (.) I don't think I don't I don't think it's should be nice surely to just study it at
8295 ((coughing)) the cell level

8296 26:40 **but that's the case**

8297 26:40 I think we've (.) like (0.4) it depends which stage you are in because you can also I can
8298 also imagine you are in the clinic and there is patient coming with cancer and they thought oh
8299 it's always mes mes me::h you get a metastasis and it's going to the liver and why is it going

8300 there? let's start looking at the body first and you find that what were cancerum (.) in the
8301 human and then isolate it and then go to cells but maybe sometimes it's better to start We start
8302 with the human because if you know if the human body ok these cells are located there and
8303 there they cause the problem (.) if you know about the whole system you can already some
8304 ideas about the more ideas about the context (.) the topic you have to first studying (0.2) may
8305 be you had a more focused approach

8306 27:37 **ut but that's the way how it is going now? Now usually doctors medical doctors**
8307 **are waiting for biologists to find or pharmacologists to find new drugs in order to be**
8308 **able to use them (.) apart from isolating you know the organs that's a different thing (.) [**

8309 27:53 [Yeah to to to some extent it's correct indeed (.) it's like uh because they already know
8310 it's cancer so they've made models of this cancer but it's sometimes maybe uh sometimes may
8311 be good sometimes it might not (.) maybe the models might not good because it's the cell
8312 model and (.) we also experience that here we u:h (.) sometimes we go too far from the
8313 natural environment

8314 28:21 **Yeah and uh to put the question in a different way (.) why are medical doctors**
8315 **that are not researching with you why it's a big focus in the biology level and doctors**
8316 **have nothing to say here for example at this level whereas they know the human body**
8317 **more than you or how it functions all together more than you (.) why they're not here**
8318 **present (.) you I have the impression that you're looking at it from the smallest to the**
8319 **biggest**

8320 28:54[small (.) yeah smallest to biggest

8321 28:55 **whereas the there is this saying of the the sum is not the u:h the whole is not**

8322 29:03 More than the sum of the parts yeah

8323 29:04 **Yeah (.) so why you're seeing it like that ok you're studying the smallest part then**
8324 **you would solves the problem? is this it?**

8325 29:12 Yeah it's also sometimes I experience also there is (.) we're not doing the correct thing
8326 29:15 **uhum**
8327 29:17 I also found like for example like we're doing culture of colon cells where the way
8328 we're culturing them is not representative for the body (.) so then yeah of course (.) you're
8329 finding something which is just opposite of what is happening in the body (.) and I think it
8330 would be::: sometimes better to have more interaction between biological::: like bio people
8331 and medical people
8332 29:47 **ok so for example this issue of co2 level of 5% (.) it would be easier for medical**
8333 **doctors to realize during the research they would say ok usually we shouldn't work at**
8334 **5% level because they know that this organ in particular is that or that**
8335 30:05 Exactly (.) I fully agree
8336 30:10 **what about the medium? the medium too**
8337 30:11 the medium also for example here we're culturing cells in a medium at pH 7.4 or
8338 something like that (.) it's not (.) but the problem is like we're studying also colon cancer (.)
8339 and the colon is lower pH it's more acidic and yes and here they say well if it's more acidic
8340 it's more like in cancer because in a cancer it becomes lower pH (.) but in colon it's just (.) it's
8341 normal for the colon cells to be in this way so if you see something that is changed by lower
8342 pH it's not because of cancer (.) it's because (.) being less cancer (.) because it's more normal
8343 for this cell (.) so it's (.) sometimes like hte model: what people use if they don't think about
8344 the whole context of course they are doing exact the wrong way

8345 **Daniel 29**

8346 31:46 **why cancer has to be studied first at the biologist level? why at the cells level first?**

8347 31:55 because (.) these are the cells which are responsible for the cancer (.) o we need to
8348 understand (.) what it's happening in the cells (.) this these cells are the source are the source
8349 of cancer (.) so::: yeah we need to study to study them to understand the cancer

8350 32:24 **may be from a biological point of view you think it's the cells because you work at**
8351 **the very very the smallest part in the body (.) may be from a physician point of view (.)**
8352 **it's not a (.) a sickness that happens necessarily (.) it's a condition (.) that is everywhere**
8353 **and that starts uhm**

8354 32:46 Yeah but at the end we know that (.) these are the cells (.) u::h which forms the tumor
8355 which are responsible for the progression and (.) of the cancer so (.) this is the entity of the of
8356 the cancer

8357 33:02 **ok so this logic that you're giving the idea of u::h going from smallest to biggest**

8358 33:11 yeah

8359 33:12 **is the solution (.) because there is another saying that says (.) that says the sum of**
8360 **all parts (.) the whole (.) is more than the sum of all parts (.) sometimes to understand a**
8361 **condition or (.) something (.) it's not to understand the little parts to be able to**
8362 **understand the (.) there is more**

8363 33:33 Yeah

8364 33:34 **and which is why (.) some physicians are doing research (.) in the cancer in cancer**
8365 **u::hm as disease (.) in a different way in different hospitals (.) is this true?**

8366 33:48 Yeah yeah (.) some people are working directly on the (.) patients or:: (.) uh uhmm (.)
8367 I'm not saying that (.) one option is better than the other one I think it's quite u:h
8368 complementary (.) approaches so uhm for sure we need to understand (.) what is directly (.)
8369 in for patients (.) but we need also to understand at the cellular (.) so (.)

- 8370 34:26 **yeah but I understand**
- 8371 34:27 we need also
- 8372 34:28 = **at the cellular (.) you need always feedback of people who know the global**
- 8373 **picture may be?**
- 8374 34:34 Yeah but the opposite is u:h is also true
- 8375 34:37 **yes**
- 8376 34:38 to understand it at the::whole level (.) it's also need to understand what is occurring at
- 8377 the cell level (.) so
- 8378 34:48**so there is a need to work tightly?**
- 8379 34:49 yeah
- 8380 34:50 **still have two questions**
- 8381 34:54 ok ((laughter))
- 8382
- 8383 **Dilara 29**
- 8384 30:19 **Ok why cancer has to be studied first at the biologist level? Why at the cell level**
- 8385 **first? Pourquoi cette logique de il faut tester les cellules d'abord ensuite passer à in**
- 8386 **vivo?**
- 8387 30:35 Parce que c'est plus rapide c'est moins nocif (.) plus rapide uh les cellules les lignées
- 8388 cellulaires on peut en avoir euh des millions en très peu de jours et faire toute une batterie très
- 8389 (.) de test (.) très rapidement ce qu'on peut pas faire avec un des animaux et encore moins des
- 8390 humains et puis euh d'un point de vue éthique ben c'est aussi euh mieux vu que ya pas
- 8391 d'éthique sur les ((laughter)) lignées cellulaires et c'est moins cher (.)

8392 **Gaelle 29**

8393 33:04 **Why cancer has to be studied first at the biologist level? Why at the cell level**
8394 **first?**

8395 33:12 Because it's the:: first entity of the tumor (.)

8396 33:19 **Are you sure?**

8397 33:21 Not u:h but without the cell u:h without the cancer cells you don't have cancer

8398 33:31 **Yeah but is the cell (.) uh dependent or may be enough?**

8399 33:38 No (.)

8400 33:39 = **to understand it at the cell level?**

8401 33:40 No everything is u:h (.) it's more complicated because you've all the micro
8402 environment (.) you all for example the immune immune cells u:h the immune system who
8403 can also play a role in the:: tumor so: the:: also the blood vessels (.) so it's not only cancer
8404 tumor is not only cancer cells (.) so everything is connected but first (.) you need to:: to see
8405 the basic stuff and then for example that's why we use in vivo to have all of this u:h

8406 34:16 **Yeah but you don't go to in vivo unless you succeed in the in vitro**

8407 34:21 Yeah

8408 34:23 **and the cell as an entity (.) is it enough to understand the phenomenon of cancer?**
8409 **How does it work cancer?**

8410 34:32 mmm no you will know u::h at least principal characteristics (.) but u::h you need to
8411 u::h to go further and see the interaction with other uh other uh cell types

8412 34:54 **Yeah but the the the logic is like starting from the smallest and then you will go to**
8413 **the bigger is it like is it like a good logic? or maybe you need from the beginning to**
8414 **understand the whole thing and then**

8415 35:07 It will be more complicated (.) you need to dissect everything

8416 35:11 **Other other physicians clinical doctors actually study cancer not at the cell level**
8417 **but at the: organs level**

8418 35:20 Yes because they have everything (.) but for us it's impossible

8419 35:27 **Because they have everything?**

8420 35:28 Yes

8421 35:29 **So it's a matter of being u::h (.) able to access**

8422 35:31 Because they have u:h they have patient with u::h with tumors that we cannot ask uh
8423 the patient to stay with us u:h

8424 35:44 **But which is better to understand how cancer (.) the cancer metabolism or how it**
8425 **works? Which is better?**

8426 35:50 But for example (.) it's fo::r to study the tumor uh in itself it's impossible because how
8427 can you::: you cannot u::h for example we treat with compound and so on we cannot give the
8428 compound to the patient and u::h and you cannot do everything with the patient (.) if we kill
8429 the:: for example if you want to see if the may be uh or the compound that we use is toxic for
8430 cancer for cancer cells it can also be toxic for other cells cell types so if you want to know it
8431 before to give to the patient you first have to check in vitro so you cannot u::h

8432

8433 **Paul 29**

8434 **Ok last question now (.) why cancer has to be studied at the biologist level? Why at the**
8435 **cell level first and then you move on to the medical level?**

8436 15:50 (0.5) well if you want to understand uh the the the pathogenic mechanism if you want
8437 to understand why a tumor cell is proliferating like crazy you need to you need to to enter in
8438 the in the molecular the biochemical determinants of the of the cell biology so you need to uh
8439 simply the system but uh using the the (.) the most uh (.) most simplified model which is the
8440 cell the cancer cell (.) but seriously now we try to to uh to use this simplified model in a

8441 smart way (.) the first consideration is to know that we are working on a restricted model (.)
8442 on a simplified model and that there is (.) still a lot of things which need to be validated first
8443 in animals before the clinics (.) and the second thing is to try to make these model less
8444 artificial as possible so to consider uh the pH to consider the access to oxygen to consider the
8445 the amount of nutrients (.) so we need models but we need also at the same time we need to
8446 know the limitation of the model we we used (.) but we could not work directly on the on the
8447 on the tumor biopsies from the patient to understand the disease
8448 17:26 **but there is research in parallel that is done by physicians medical doctors**
8449 **working at uh the patients level or no?**
8450 17:36 It's it's it's surely a research which is which is u:h much more linked to the efficacy of
8451 drug or to the resistance of drugs (.) so these drugs have been identified uh because of these
8452 basic research work (.) then the drugs arrive in the clinics and there you want to see whether
8453 all the patient reponse to the drug if not all the patient respond to the drug you want you want
8454 to find some u:h some (.) to identify some reasons for that and there you're using them the
8455 cells but you need to stay with the patient (.) you need to see why is this patient responding
8456 and this other one not and this is clinical research (.) research which cannot be done or
8457 recapitulated using cells or animals (.) uh so I think it's a different research an important
8458 research which is at the at the very end of the of the of the loop uhm and they will more work
8459 on finding some biomarkers uh which allow them to identify the the patient's which are more
8460 prone to respond to a treatment so this is clinical clinical research which (.) if you take a
8461 biopsy from a patient you can compare the biopsy of a patient would it respond to a biopsy of
8462 a patient would it not respond you may look at the expression of some proteins to try to
8463 understand the difference but you will not be able to enter in very fine regulatory pathway or
8464 the understanding will be quite limited if you compare with what you can do with uh with
8465 cells (.)

8466 19:33 **but is it a two way dir uh direction? or a one way direction? you start at the cells**
8467 **and then you go to the medical or clinical level than do you get feedback again and you**
8468 **use them in your literature uh before you start another research or it's just**

8469 19:48 you know that's that's the the the optimal way (.) it should be like that uh knowing that
8470 for the last three years there is an increasing uh models of uh of uh biopsies of patient tumors
8471 so taking a little bit of the patient tumors which to directly insert the small biopsies of tumors
8472 in the mice in a mouse in order to (.) to have a mouse developing exactly the same cancer as
8473 as the patient (.) and if you do that on several patients including some responding and not
8474 responding (.) you may develop the cancer in the mouse and then you can extract the cells
8475 from these mice and have again the the the model to understand why this one did respond in a
8476 patient and this one did not respond and to know again quite the kind of uh the very basic
8477 research to to uh to identify the pathway which make a difference to be back to the clinics
8478 and say ok the (.) we can now consider that these biomarker is a good one to determine
8479 whether the patient will response or not (.) and for the patients who are not responder it
8480 doesn't make sense to treat with this compound but to choose another one (.) so uh the
8481 multidisciplinary approach is necessary and it has to go in in in the different direction to to to
8482 find to work with uh specialists in other fields which allow to better understand your basic
8483 research and clearly the clinicians in order to uh to have your feedback about how the the
8484 drug which is derived from your experJoannets it work or how it we could improve its use in
8485 the future (.) so I think it's kind of uh uh feeding itself

8486 21:55 **interrelated (.) ok thank you very much**

8487

8488 **Cédric 29**

8489 27:14 **ok (.) why has cancer (.) does cancer have to be studied first at the biological**
8490 **level? why at the cell level first and then you go bigger?**

8491 27:25 what do you mean?

8492 27:25 **why you need to start from s the cell to understand the metabolism (.) you say**

8493 **metabolism (.) to understand cancer (.) and then go to the tissue and go to in vivo? Why**

8494 **is this logic? You need to start from the cell whereas cancer is a disease that is really**

8495 **more complicated in the body and involves different u::h**

8496 27:46 Yeah of course but you always do: you don't always do like (.) like that I mean

8497 sometime you start both in parallel and you start in vivo project and in vitro so you work on

8498 cells and on mice or what's () and then you can from the (.) from the cell you can get some

8499 result that are more basique (.) for the mice you get more complicated res result but the the

8500 one on the cell can appear to understand uh more complicated results

8501 28:15 **So you're saying that you already do twice the two in parallel?**

8502 28:20 Yeah

8503 28:20 **You can start in vivo?**

8504 28:21 Yeah

8505 28:24 **and observe (.) ok**

8506 28:26 you're not always working just in mechanical cell and then going up and up and up (.)

8507 you can start by doing mechanism cell and:: find some stuff that are useful to look and then

8508 move to mice but you can also do it in parallel and

8509 28:42 **ok**

8510 28:43 There is a lot of (.) way to do research

8511 28:46 **what about physicians or clinical researchers that are working on cancer with**

8512 **patients not at the biology level? What about that? As as a way of doing research on**

8513 **cancer**

8514 28:59 Yeah there is (.) they are doing clinical research so (.) the we (.) what they are doing

8515 has already been tested before that (.) pre cli pre cilinical stage

- 8516 29:09 **which is here (.) biology**
- 8517 29:10 Yeah or anywhere
- 8518 29:14 **so they already use your your uh work right?**
- 8519 29:19 Yeah of course you cannot just say ok I have the compound (.) it may work (.) let's try
- 8520 it on human (.) you will have to test first either in cell or in mouse so you can you can use it
- 8521 29:31 **ok you're talking about medicine drugs in particular but I'm talking about**
- 8522 **understanding the metabolism (.) understanding how it works in the body**
- 8523 29:40 You can also work from biopsy and stuff like that yeah (.) so directly from patient
- 8524 29:47 **what it's better or**
- 8525 29:49 It's different
- 8526 29:50 **because often times you have (.) you faced you know problems like if you move**
- 8527 **from in vitro to in vivo (.) or if you move from mice to humans you're faced with u:h big**
- 8528 **surprises because uh**
- 8529 30:02 Yeah
- 8530 30:02 = **it doesn't function the same (.) so what's the point of u:h in terms of**
- 8531 **understanding the metabolism? why it's not done by biopsy? Through biopsy**
- 8532 30:13 Because biopsy is giving you so many so mu so few sample that you can't do all the
- 8533 work that's all
- 8534
- 8535 **JOANNE 29**
- 8536 27:42 **ok (.) does cancer have to be studied at the biologists level first? what at the cell**
- 8537 **level first?**
- 8538 27:51 what do you mean by that?

8539 27:53 **Why you want to understand cancer at the cell level first and then you will see**
8540 **how it works in the body (.) you assume that uh the cell is uh is everything in**
8541 **understanding the cancer metabolism?**

8542 28:10 Yes but it's the first thing you have to do (.) you can't go directly to the body to kill
8543 people like ((laughter)) you have to start with uh even like u:h you know mice (.) you can't
8544 start directly with mice (.) you will kill a lot of mice like that (.)

8545 28:30 **uhum**

8546 28:30 You have to first study with the:: cells to see if there is any toxicities stuff like that (.)
8547 to understand the mechanism how it's working and all ↑ and then when you are you have all
8548 the confirmation it's working on the cell you have more and higher percentage that it will
8549 work (.) in the mice

8550 28:52 **but there are there are doctors (.) medical doctors (.) physicians clinical (.) that**
8551 **are working with people (.) it's just people who are sick who get to them (.) and they're**
8552 **working with them (.) they're treating them u:h u:h**

8553 29:08 It's not directly (.) it's not directly they don't know anything about the product and they
8554 go start directly with the people no (.) they have an idea about what what is happening but
8555 sometimes in cases like for example cancer here (.) there is some people they don't have any
8556 hope (.) they know they will die anyway (.) and there is some kind of product (.) they didn't
8557 reach for example the third uh step of clinical research but they go to the; clinicians and they
8558 will say ok (.) I'm agree and they have to sign sign a paper (.) that they agree to do this kind
8559 of u:h experJoannets with them (.) even though we didn't go upper this third clinical step (.)
8560 so they will not start directly with the people (.) it's impossible (.) in cases like that the people
8561 will agree to try the product even though it's not in the market yet (.) but that doesn't mean the
8562 product didn't go through cells first and then mice and then humans

8563 30:23 ok what (.) in order to understand the metabolism (.) of the of cancer (.) is it
8564 enough to just look at the cell and not think about the whole tissue or the whole body at
8565 the same time (.) if you remember the other day (.) when we talked about the
8566 temperature regulation in the body (.) nobody was able to answer what are organs u:h
8567 that regulate the temperature bu they all said that that ok it's a whole system everything
8568 is interfering (.) so in order to understand how temperature is regulated (.) you need to
8569 have the bigger picture (.) also in order to understand cancer and how it works (.) is it
8570 enough to just look at the cell ↑ and then go to in vivo and so ok uhm it doesn't work
8571 like we thought about it in vitro so?

8572 31:13 I'm not saying it's enough (.) but I'm saying you should not kill (.) mice or animals like
8573 that (.) when you don't know anything about the product (.) so you have first to understand at
8574 the level of the cell even though it's not enough (.) and then you go to mice and then the body
8575 () that's why in the market they oblige you to: follow these steps (.) it's ethical

8576

8577

8578 **Question 30:** Is it enough to read about other specialties' contributions to your domain or do
8579 you think that everyday interactions are irreplaceable?

8580

8581 **STEPHAN 30**

8582 31:02 and some people (.) this brings us to almost uh not the last question the one the
8583 one before the last question regarding how different disciplines exchange u:h knowledge
8584 (.) u::h is it enough to read about the others specialties contributions or do you think
8585 that everyday interactions with others is irreplaceable? for example for example you're
8586 doing research at the biology level here and you say ok after sometime uh we'll go
8587 through the toxicity test or doctors will be there or no matter what we'll go through

8588 **publications and others will read and so on and so forth (.) is that enough to solve**
8589 **the issue of**

8590 31:49 I think you have to be more:: involved already in earlier stages (.) u::h like for example
8591 I was in the USA there was (.) when I was working in the cardiac sciences there was on a
8592 weekly basis every week there were people presenting (.) one day it was a clin one week it
8593 was a clinician the other day it was a clinician the other day it was more fundamental basic
8594 science u:h biologists (.) and they were:: presenting data (.) every week there was someone
8595 presenting it was talking about studies (.) and then like clinicians in biology they give (.) they
8596 share their ideas and that time together ↑ and it's much more regularly and you can get much
8597 more faster feedback (.) if you have much more people contact (.) there's much more:: they
8598 were forced to work together (.) for example I think here it would be also a good idea than it
8599 has to (.) have more joint meetings for example the research group here and may be some
8600 doctors from the hospital

8601 32:58 **and uh to be u:h to be frank with you (.) for me its not only about exchanging data**
8602 **or knowledge or being in contact from time to time or weekly to sha::re data (.) for me**
8603 **knowledge IS created [**

8604 33:17 [It is created because yeah that's also whenever that does meetings sometimes they
8605 give them comments they say no but it is like this and then this is the way we:: see this
8606 mechanism they say oh but maybe it's because of that and then at that spark they came up
8607 with an idea then maybe we should do like this (.) yeah if you use this and this method you
8608 can may be see this and then they have new ideas for (.) things and uh

8609 33:43 **so knowledge emerges from [**

8610 33:44 [it emerges from from this meeting yeah because you have two people with different
8611 views I think may at the end you get like the:: oh yeah yeah yeah (.) it's like

8612 34:01 **this is contrary to the idea of your colleagues who said no but no matter what we**
8613 **later on we'll share [**
8614 34:07 no but it'll be too late
8615 34:08 **sorry?**
8616 34:09 then it'll be too late
8617 34:10 **it's too late ((laughter)) exactly**
8618 34:09 it's u::h no for me that's not u:h (.) for some studies yes ok depending on what you're
8619 working on some things you're looking at very (.) fundamental mechanisms and pathways (.)
8620 yeah you don't need a clinician for that but (.) sometimes just to discuss one kind of models
8621 do you use for kind of things (.) have a critical view like is it a representative thing? is it
8622 useful to study these kind of models so can you couple it with others oh yes (.) so I'm more
8623 for collaborations and more interactions I've seen it many times before we're reinventing the
8624 same thing over and over or going in the wrong way
8625 34:58 **so there is some neglect regarding how communication should go**
8626 35:02 oh yeah
8627 35:04 = **and that is based on the fact that u:h people think that communication is just**
8628 **about sharing knowledge (.) I'll give you what I did you give me what you did or what**
8629 **you found and that's it we did what we should do (.) communication wise is fine (.) as**
8630 **long as I publish as long as you meet once a year or once every month so that's fine (.) I**
8631 **told you what I did and that's it**
8632 35:28 yeah but that's not enough but that's ((laughter)) the lack if if if you look at more: (.)
8633 other institutions nowadays like for example () or in the US there (.) they build like new
8634 buildings for research and clinicians (.) they build them together for the reason they get
8635 connected and for the reason to enforce people to meet and to be stuck on top of each other
8636 just to enforce more interrelations I think here it's (.) the discussion should be more (.) u:h in

8637 the play between clinics and basic science (.) I didn't see it that much here (.) I think it's not
8638 enough

8639 36:11 **ok that is they are aware they are aware that interaction brings knowledge**

8640 36:18 Yeah

8641 36:19 **not just exchanges knowledge**

8642 36:22 They there they force them to bring knowledge while interacting

8643 36:25 **ok thank you for much ((laughter))**

8644

8645 **Daniel 30**

8646 34:56 **((laughter)) is it enough to know about the other specialties contributions (.) or do**
8647 **you think that everyday (.) interactions with others is irreplaceable (.) irreplaceable?**

8648 35:07 u:h (.) I would (.) I would say that () interaction is u:h it's better (.) or mo::re (.) useful
8649 most appropriate way that uh (.) yeah we cannot replace interaction between uh between
8650 people to (.) to discuss

8651 35:35 **because some people say (.) ok I I can just read uh u:h before I publish or before I**
8652 **finish my research I can read about other fields what they say (.) and I can correct or**
8653 **modify**

8654 35:49 no (.) this is not my point and that's why also we: try to (.) to present the data in (.)
8655 meetings so in congress and seminars (.) to have the feedback also of (.) other people to: to be
8656 sure that we are in the right way or may be also to (.) yeah to

8657 36:15 **ok do you have example on uh (.) when you are (.) like you feel that you are**
8658 **acquainted with someone in other fields or specialty that really helped you or at**
8659 **interaction of every days of everyday can help? Can you remember of something like**
8660 **that?**

8661 36:31 Yeah when there was u:h at the beginning when I when I came I discussed with a
8662 lady in u:h (.) she was in the the: the radiotherapy u:h and (.) and we discussed quite a lot
8663 about u:h (.) how we would be able to detect u:h tumors in the: in the patients (.) based on my
8664 results and u:h and this is this kind of discussions which is uhm important because clearly can
8665 makes the link between (.) experJoannetal researchers and what they need to: yeah what they
8666 need u:h for radiotherapy cell or clinician or (.) yeah it was something I really liked because
8667 u:h at this time I really consider that ok we are making research and this is really useful fo:r
8668 (.) for somebody else (.)

8669 37:40 **ok that you very much**

8670 37:41 you're welcome

8671

8672 **Dilara 30**

8673 31:23 **Ok is it enough to to read anout other disciplines or specialties contributions or**
8674 **you think that everyday interactions with other is irreplaceable? donc quand on parle**
8675 **de la pluridisciplinarité et cetera est ce que il suffit de lire de comprendre les**
8676 **contributions des autres ou il faut vraJoannet être en contact direct et quotidien avec les**
8677 **gens?**

8678 31:49 ben si euh je sais pas si il faut être en contact tous les jours avec les gens mais je crois
8679 que c'est intéressant de garder un contact avec les autres disciplines ne fusse que pour garder
8680 l'esprit ouvert (.) et donc dans certains cas de voilà c'est suffisant de lire un article mais euh je
8681 pense pas qu'on doit être en contact tous les jours avec toutes les disciplines qui existent

8682 32:17 **et l'interaction si tu penses aux interactions de tous les jours des discussions**
8683 **comme ça ça peut pas être un plus euh quotidien?**

8684 32:29 ça oui si c'est possible oui c'est un plus

8685 32:35 **D'accord merci beaucoup**

8686 32:37 ((laughter)) c'est fini? ((laughter))

8687

8688 **Gaelle 30**

8689 36:35 **Yes so in vitro is a is a ok important to start from (.) is it enough to read about the**
8690 **other specialties contributions or do you think that everyday interactions with other is**
8691 **irreplaceable? So it's it's for you in order to understand cancer from other perspectives**
8692 **(.) like from clinical or physician's point of view (.) s it just enough to look at their**
8693 **publications journals**

8694 37:09 No (.) you need to interact u:h like for example (.) you present your your work and
8695 you::: they will ask questions or you will ask questions for them (.) it's more I think it's u:h

8696 37:31 **So for example the contribution of the two physicians here (.) do you see that they**
8697 **are really particularly uh interesting?**

8698 37:39 They're but u:::h here there are more cardiologic (.) and not uh oncologists (.) so the:::
8699 implications is I think u:::h they are less specialists but sometimes it was also interesting to:::
8700 (.) because for example u:::h in::: to see the for example the applic the direct app:::lications?

8701 38:03 **uhum**

8702 38:04 Of uh the if test interest or not because sometimes you are stuck in your study and you
8703 think u::h it's u::h wonderful (;) but maybe it's not applicable to the clinics (.) so it has no
8704 sense (.) so:: I think it's important but fo::r example in my committee I have u:::hm a clinician
8705 and uh in the study we we found that Leukemia cells who are dependent on glutamine (.) and
8706 for example he::: and glucose also (.) and for example he said that sometimes u::h a patient
8707 which are u::h ((click of the tongue)) which have cancer (.) they give s (.) they supplement
8708 them glutamine (.) so he was ok maybe it's not a good idea to supplement them with
8709 glutamine since the the the cancer cells need glutamine to proliferate (.) so may be:: so he
8710 was interested to know that (.)

8711 39:07 **uhm**

8712 39:08 So that's it's in the two sense (.) so we need the clinician and the clinician needs also

8713 39:14 **You need to work together?**

8714 39:16 uhm

8715 39:15 **But it's it was not the case in the last decades?**

8716 39:20 I think there is (.) because there are::: clinicians who made research but maybe it will

8717 be more and more u::h the case

8718 39:32 **Ok thank you very much**

8719

8720 **Cédric 30**

8721 30:22 **ok so the difficulty is in the the matter of samples ok (.) is it enough to read about**

8722 **the other specialties contributions or you think that everyday interactions with other is**

8723 **irreplaceable?**

8724 30:39 Like with clinicians and stuff like that?

8725 30:41 **For example uh clinicians nutritionists may be**

8726 30:45 May be it's hard to have daily but monthly or a couple of months reunion or every few

8727 time

8728 30:55 **a couple of months?**

8729 30:58 meeting every couple of months meeting to: discuss

8730 31:02 **so there is no need to be working together on a daily basis with other specialties?**

8731 31:08 Yeah it can be (.) depend on the project but sometimes it's not (.) like the clinical stages

8732 totally different from pre clinical stage (.) so you're not trying the same stuff and not (.)

8733 observing the same stuff

8734 31:24 **For example the presence of a physician at the in vitro in your own (.) research at**

8735 **the in vitro level (.) will not add to you much if you're saying you're preparing**

8736 **something a physician will tell you know no try not to use this because otherwise this**

8737 **would fail in vivo because I know this**

8738 31:42 Yeah certainly (.) I mean like I have a committee and inside the committee you have
8739 physician (.) so if like during one of my committee I say ok I will try may be to use that in
8740 my next experJoannet (.) may be going to tell me that there is no point because if you do that
8741 (.) you'll never go to clinic with that it's:: already a toxic compound

8742 32:07 **ok that's because you are a Phd student but think about uh for example other**
8743 **researchers like pos docs who don't have committee u:h what would they do?**

8744 32:17 Yeah but it depends it's like always if you're going to use a compound on your cell let's
8745 say a compound that it's going to keep them (.) with the idea after to go in clinical (.) then
8746 you will look up if the com if this compound is already: u:h known toxic compound or some
8747 stuff like that (.) or you can just call a physician and ask him (.) may be he's going to tell you
8748 yeah I know I don't know uh look it up in the bibliography

8749 32:48 **ok (.) ok I think you're done**

8750 32:52 Nice in time

8751 32:54 **it was u:h ((end of recording))**

8752

8753 **JOANNE 30**

8754 31:50 **ok (.) is it enough to read about the other specialties contributions to cancer**
8755 **research or do you think that everyday interactions with others is irreplaceable?**

8756 32:09 what you mean by that ((laughter)) like you have to interact directly or to read?

8757 32:09 **yeah yeah yeah**

8758 32:13 yes if you if you can't interact (;) it's a good thing that you interact directly with the
8759 person (.) they will explain to you in the (.) easiest way (.) but if you don't have u:h that
8760 person to interact with so you (.) your option is to read that's it

8761 32:30 **can you think about examples where you where you witnessed the importance of**
8762 **interactions as compared to you know you're struggling to understand something**
8763 **through publications or let's say**
8764 32:48 see because publication is really uh big (.) it's like a sea ((laughter)) there is lot of
8765 publications on one molecule you find many things (.) and stuff like that (.) for example in
8766 my case (.) sometimes when I start to read (.) I feel lost (.) there is many things to read (.) and
8767 sometimes you feel oh my God there is all those things? If you go to someone who is
8768 experienced who has a lot of exp expe::rience (.) in the field and you ask him (.) he will will
8769 give you directly what you have to get from what from your results like for my case when ask
8770 Brian or Paul or anyone in the lab they will give me directly from their experience what they
8771 what you have to understand from that (.) if you go in the papers you'll find millions of things
8772 33:46 **ok thank you ((end of recording))**

D2. Collective interview (case 3)

- 8773 62:24 **Do you trust machines?**
- 8774 62:29 ((Brian joking)) made in China or ((laughter))
- 8775 62:30 ((Everyone laughing))
- 8776 62:38 **the machines that you use in general**
- 8777 62:40 ((Stephan)) well that's why you do controls [
- 8778 62:42 ((Daniel)) [yes
- 8779 62:42 ((Stephan)) = to check the performance of machines
- 8780 62:43 ((Brian)) Yes we trust them
- 8781 62:46 **((to Daniel)) You trust them?**
- 8782 62:47 ((Daniel)) Yeah
- 8783 62:47 **((to Gaelle)) you do?**
- 8784 62:49 ((Gaelle)) Some bu:: there're ((laughter))
- 8785 62:51 ((everyone laughing))
- 8786 62:53 ((Gaelle)) The are some machine that u:h for example (.) you test and you say ok u:h (.)
- 8787 I can trust because u:h I have the same kind of result from time to time (.) then u:h and
- 8788 sometimes when the machine give can gives wrong results (.) it can be either the machine or
- 8789 you experJoannetal condition so you can check u:h the machine
- 8790 63:15 ((Daniel)) uhm so because we're using control
- 8791 63:18 ((Stephan)) yeah
- 8792 63:18 ((Daniel)) =so we can:: know (.) if the machine is u::h giving (.) the right u:h values [
- 8793 63:25 ((Brian)) always we use u:h yeah always (.) Yeah normally you need to test the
- 8794 machine ↓ and (0.2)

8795 63:33 **Ok (.) but you know you know the difference between trusting the machines**
8796 **because they are consistent (.) you trust because they are consistent so there is no**
8797 **troubleshooting and trusting it because you're sure that it measures what you want to**
8798 **measure?**

8799 63:49 ((Brian)) Yes both you need both

8800 63:50 **Like the sophisticated machines (.) how do you know that what you get at the end**
8801 **like the graphs and the numbers or the colors (.) how do you know that it's really**
8802 **reflecting what it's supposed to measure?**

8803 64:06 ((Daniel)) but because we have some controls (.)

8804 64:08 **Like?**

8805 64:10 ((Daniel)) Like u::h you know you're measuring Glucose in the medium (.) we have
8806 also:: some () standard with u:h glucose u:h I don't know (.) glucose buffer or:: and we we
8807 know (.) which concentration of glucose you should measure and we will see if the machine
8808 is able to::

8809 64:32 **But this is a very simple simple thing to know right? I'm talking about you know**
8810 **sophisticated machines like boxes you put something there and it gets out that you**
8811 **cannot test in a different way (.) like the glucose you can test very simply**

8812 64:46 ((Stephan)) Normally you have some kind of a standard and you should get a regular
8813 correlated response (.) and if you don't get that standard there is a problem somehow in the
8814 machine (.) because you know what you put in (.) so you know what normally the machine (.)
8815 you have some preparation what should come out (.) if it does not come out then you know
8816 it's possible malfunction (.) or you compare one machine with the other (.) and then see (0.3)

8817 65:20 **You know what you put in? But how do you know because [**
8818

8819 65:23 ((Stephan)) [because if you (.) like if you have a measurement machine you (.) you
8820 make your own concentration your way you pipette your solutions (.) you measure it in the
8821 machine and you get a signal (.) and then you:: plot and you can see if you have (.) the:: the
8822 radiation shift shoo shoot

8823 65:41 **That's for things that you can measure and observe otherwise (.) in different way**
8824 **(.) but there are things that you can never see or test because they're just (.) you know at**
8825 **the level of RNA or DNA**

8826 65:56 ((Stephan)) Yeah but even there you do u::h dose response

8827 65:59 **You do?**

8828 65:59 ((Stephan)) Yeah uhuh

8829 66:00 **You do what?**

8830 66:00 ((Stephan)) add like a doses (.) varying doses and you get a response of what you
8831 measure

8832 66:07 **Using the machine**

8833 66:08 ((Stephan)) using the machine

8834 66:09 **but that's the machine that's giving you that those doses**

8835 66:14 ((Stephan)) No it's (.) I determine the dose that I put in (.) I have other machines that
8836 use to determine the dose and other machine to validate another machine

8837 66:23 **If you determine the dose (.) then the machine is not going to measure the dose (.)**
8838 **why you need the machine because you already determined it (.) the machine will**
8839 **measure something else**

8840 66:32 ((Stephan)) Yeah but exactly (.) to:: because (.) that response I know how it should
8841 respond to the dose I put in

8842 66:40 **Yeah the [**

- 8843 66:40 [It's measuring something else (.) a product or something else but it's related to my
8844 dose
- 8845 66:45 **This is what I'm saying (.) the machine may be consistent (.) everytime you give it**
8846 **this dose it will give this (.) and then you give a higher dose it will give you that (.) and in**
8847 **terms of graphs and colors and shapes it's consistent no problem (.) but how do you**
8848 **know that it is measuring what you want to measure?**
- 8849 67:03 ((Gaelle)) because if you put water for example it will not u:h measure
- 8850 67:05 ((Stephan)) Yeah (.) this one answer for the controls
- 8851 67:08 ((Gaelle)) for example for the QPCR if you put water you will not have any
8852 amplification
- 8853 67:12 ((Stephan)) You won't get a signal
- 8854 67:14 ((Daniel)) and the machine doesn't know that you put water
- 8855 67:16 ((Gaelle)) Yeah
- 8856 67:18 ((Daniel)) the machine will try to to measure something but u::h
8857 67:22 **It can measure**
- 8858 67:23 ((Daniel)) It's not like you force the machine to::: to say there is nothing in this way or
8859 (.) the machine is just measuring u::h in (.) always and at the end you (.) you can check
- 8860 67:34 **No I mean (.) it may be working for cells but measuring other things (.) so yes it**
8861 **only measures cells not not later (.) but may be other things (.) may be it's reflecting**
8862 **other things or in u:h in a wrong way (.) not exactly reflecting what you want to**
8863 **measure in the cells**
- 8864 67:54 ((Stephan)) ↓ may be like contamination or something
- 8865 67:58 **I don't know what it can measure the machine (.) it's it's like a black box (.) the**
8866 **provider says**
- 8867 68:03 ((Gaelle)) Yes but you know the principle of the machine

8868 68:06 ((Stephan)) that's why

8869 68:07 ((Gaelle)) Yeah (.) even if it's a black box

8870 68:09 **you know the principle?**

8871 68:10 ((Daniel)) Yeah of course

8872 68:11 ((Gaelle)) Yeah

8873 68:12 ((Stephan)) you have to know it

8874 68:13 ((Daniel)) No one can trust a black box

8875 68:16 ((Stephan)) and you also normally you you can:

8876 68:18 ((Gaelle)) it's not a magic stuff

8877 68:20 **((laughter))**

8878 68:21 ((Stephan)) You can use (.) you can use multiple methods to measure the same thing if

8879 you're

8880 68:24 ((Because Brian left the room for a while and now is back I repeated the same

8881 question))

8882 **Not for everything (.) there are things that are only only measurable using one (.) we're**

8883 **talking about the difference between consistency (.) and that they reflect what you want**

8884 **to measure (.) so the machine can be consistent you say ok I give it this dose (.) dosage (.)**

8885 **it gives me this then if I give give a higher it gives me this (.) every time I know that the**

8886 **machine is consistent so it's functioning well (.) but (.) is it measuring what you're**

8887 **measuring**

8888 68:56 ((Brian)) Yes

8889 68:56 ((Stephan)) You you can check you can also check the the like the I've a machine

8890 downstairs (.) it can also give me (.) a nice dose response (.) but I also do another

8891 measurement to check that the product that was for is indeed the product that I want I (.) I'm

8892 looking at and there's another method for looking at that

8893 69:15 ((Brian)) yeah

8894 69:14 ((Stephan)) and then can see it's a false it's a wrong peak then I know this is an

8895 unreliable one but that's why you can do multiple measurement (.) to validate the

8896 performance

8897 69:24 ((Gaelle)) Yes usually you do several types of experJoannets to validate one result

8898 69:29 ((Brian)) one machine

8899 69:30 ((Daniel)) Yeah

8900 69:32 **so you compare you compare different machines that measure the same thing?**

8901 69:36 ((Daniel)) Well yeah

8902 69:37 ((overlap. Inaudible))

8903 69:39 ((Stephan)) Yeah it's [

8904 69:40 ((Brian)) But then you have any for example false results in a machine (.) you can even

8905 put different compounds to see the different density (.) know with (.) in which wave this

8906 compounds are emitting lights or you have different tests and:: then you rely on the machine

8907 (.) depending on this results

8908 70:04 **so for example the spechtrophotometer this one measures for example density of**

8909 **u:h the density for example**

8910 70:11 ((Brian)) yeah absorbance oh yeah

8911 70:14 **so it tells you this (.) it's this density then because there are lights that are**

8912 **reflected and if they are refracted back so**

8913 70:23 ((Brian)) this is fluorescence

8914 70:26 **this is fluorescence**

8915 70:26 ((Gaelle)) Yeah

8916 70:27 **but what about the fluorescent or the (.) is it a liquid or like you put the**

8917 **fluorescent yourself or**

- 8918 70:34 ((Gaelle)) You put a compound and it will react (.) for example the compound in the
8919 cell and it will gives u::h fluorescence
- 8920 70:44 **so you're sure that the machine responds to that compound in a perfect way?**
- 8921 70:48 ((Brian)) yeah
- 8922 70:49 ((Daniel)) yeah
- 8923 70:48 ((Gaelle)) Yeah because there are different emission u::h [
8924 70:52 ((Brian)) you have different filters
- 8925 70:55 ((Gaelle)) Yeah
- 8926 70:57 **can you think of other complicated machine?**
- 8927 71:00 ((Gaelle)) You can if you hhh want ((laughter))
- 8928 71:01 **No because I don't know (.) because I'm (.) you may know of other machines that**
8929 **are really like black boxes (.) You can't really know what it does inside**
- 8930 71:10 ((Gaelle)) ↑No (.) you know
- 8931 71:10 ((Stephan)) ↑ in principle you should know always know how it works [
8932 71:13 ((Brian)) yeah you know yeah [
8933 71:14 ((Gaelle)) ↑ = yeah in general the person know what they did (.) They did just not do
8934 that and have a machine with u::h other stuff [
8935 71:21 ((Daniel)) Yeah we will not trust a company trying to sell u::h machine [
8936 71:25 ((Gaelle)) without saying what's inside [
8937 71:25 ((Daniel)) if we don't know what is the principle [
8938 71:27 ((Brian)) we know how it works [
8939 71:29 ((Daniel)) we need to know (0.3)
- 8940 71:35 **ok do you trust the products that you purchase from other companies (.) now I'm**
8941 **not talking about the medium (.) anything (.) you have the Trypcine (.) you know like (.)**
8942 **first you have immortalized cell lines so these cell lines are not like:: like primary cells**

8943 **so immortalized which means they're modified (.) then you purchase like the medium (.)**
8944 **then the Trypcine (.) you need it then any type of compound that you use (.) do you trust**
8945 **them all?**

8946 72:06 ((Daniel)) we have [

8947 72:06 ((Gaelle)) Yes (.) but if you can (.) if at one moment you can see that there is
8948 something going not in the right way (.) you can say may be there is a problem with this
8949 product (.) and for example (.) you can send an e-mail for (.) to the company and ask for the
8950 control (.) the quality control see if there is other reported problems (.) and so on

8951 72:28 **so only when there is a problem that is apparent ? (.) if you compare it to the**
8952 **previous one (.)**

8953 72:33 ((Stephan)) but that's why you perform controls (.) to check the performance of your
8954 assay

8955 72:37 **No but I'm I'm talking talking about the trust that they are [**

8956 72:41 ((Stephan)) Normally you trust them (.) unless you:: [

8957 72:43 ((Daniel)) [Yeah it's the same for the medium[

8958 72:45 ((Brian)) Yes it's the same

8959 72:47 **It's the same you mean you have to trust you don't have more options or that [**

8960 72:51((Brian)) [No no you can check (.) but normally it works (.) if they're selling good
8961 stuff

8962 72:57 ((Stephan)) we always perform controls with also more or less validation of the used
8963 materials

8964 73:02 ((Gaelle)) [but may be for sure there are contamination (.) the powder that we: they
8965 give us maybe like 98% of u:h the: indicated product and have 2% of for example the
8966 previous production or some: something else (.) but: (.) they they put for example in the
8967 product there 98% u:h purity

8968 73:22 ((Stephan)) [98% purity
8969 73:26 **ok (.) in your everyday experJoannets like your usual experJoannets (.) if you**
8970 **think now of what you're doing right now in this lab (.) what is the ratio of the**
8971 **operations that are made ready to you by other parties (.) for example the cells the**
8972 **medium the Trypcine the machine everything that you use (.) there're different steps in**
8973 **every research (.) how much per cent is used u::h like provided as compared to**
8974 **homemade?**
8975 74:00 ((Stephan)) u::h 75%
8976 74:02 ((Brian)) now I used like 75% (.)
8977 74:08 ((Daniel)) 80%
8978 74:11 **80?**
8979 74:12 ((Stephan)) 80%
8980 74:14 ((Brian)) 75 yeah 80 depends uh depends on the experJoannet
8981 74:20 **if you if you take just u:h 10 seconds to think about your own experJoannet and**
8982 **think about everything (.) every single thing that use like from machine to products (.)**
8983 **what is made here? and what is purchased?**
8984 74:34 ((Stephan)) oh then there is 99% ((laughter))
8985 74:36 ((Daniel)) yeah for some experJoannet it could be almost 100%
8986 74:41 ((Stephan)) what already you make u::h like all the composite you put together yourself
8987 they're also ready bought
8988 74:47 ((Brian)) no for the western blot I would say it's 60%
8989 74:50 ((Gaelle)) yes it depends from which u::h experJoannet you're doing
8990 74:55 **so even for the things that you make here (.) you start from something that is**
8991 **already purchased and which can have influence on your work (.) so in this sense how**
8992 **much you ((laughter)) how much is left?**

- 8993 75:07 ((Gaelle)) but everything (.) we start from everything that is bought [
8994 75:07 ((Stephan)) everything we buy is u:h
8995 75:11 ((Gaelle)) = no we're not producing anything
8996 75:13 ((Daniel)) Yeah
8997 75:13 ((Gaelle)) everything starts ((inaudible))
8998 75:16 ((Daniel)) yeah if you're thinking like that it's 100%
8999 75:17 ((Gaelle)) we do not produce
9000 75:18 ((Brian)) Yeah you buy the glucose you buy everything then you mix with water you
9001 adjust the pH but (.)
9002 75:24 ((Stephan)) the RNA is also produced by a patient so ((laughter))
9003 75:30 ((everyone laughing))
9004 75:32 ((Stephan)) as long as I don't study my own it's 100%
9005 75:34 ((laughter))
9006 75:37 ((Gaelle)) yes sometimes you're using from colleagues
9007 75:42 ((everyone laughing))
9008 75:44 **but what (.) if you compare this to the past for example if you think of biology**
9009 **may be fifty years ago or if you happen** [
9010 75:52 ((Brian)) well they also had to buy the same
9011 75:54 ((Daniel)) yeah yeah
9012 75:55 ((Brian)) they had to prepare [
9013 75:55 ((Gaelle)) most stuff
9014 75:56 ((Brian)) to find a problem
9015 75:59 **they had to buy?**
9016 76:00 ((Brian)) they the original compounds yes
9017 76:04 **even in the past without these companies that are popping now**

- 9018 76:07 ((Stephan)) no there was more to be mixed yourself (.) now you have more ready pre
9019 mixed (.) they still had to mix (.) so in that sense
- 9020 76:18 ((Gaelle)) and there was less (.) different types of experJoannets also
- 9021 76:22 ((Brian)) yeah
- 9022 76:25 **ok how how do you account for this? this u:h this situation of u:h being dependent**
9023 **on providers?**
- 9024 76:34 ((Stephan)) I think it's fine
- 9025 76:34 ((Brian)) yeah
- 9026 76:37 ((Gaelle)) because it would be a plus of a lot a lot of ah (.) it would take a long time to
9027 produce everything by yourself
- 9028 76:43 ((Brian)) money uh yeah
- 9029 76:44 ((Stephan)) time and money
- 9030 76:45 ((Gaelle)) you need chemistry stuff and:: making the product and so on (.)
- 9031 76:51 ((Stephan)) it's good for consistency and
- 9032 76:53 ((Gaelle)) to check the purity of the product to:: [
9033 76:55 ((Brian)) [quality control then [
9034 76:57 ((Stephan)) [it saves a lot of time
- 9035 76:58 **ok but in terms of u::h (.) the idea that you don't know what's there (.) that you**
9036 **have to trust (.) even if you can know (.) you'll need to check everything by ok (.) but at**
9037 **the end you don't know (.) so you have to trust**
- 9038 77:14 ((Daniel)) uhum
- 9039 77:14 ((Gaelle)) uhm
- 9040 77:14 ((Stephan)) Yeah but otherwise you have to make it yourself and it's also (.) it also
9041 there is much room for error (.) so (.) for me the choice
- 9042 77:21 ((Brian)) and you trust them

- 9043 77:22 ((Stephan)) = you trust them or not
- 9044 77:23 **you're again talking about practicality and feasibility (.)** [
- 9045 77:26 ((Brian)) yeah ((laughter))
- 9046 77:28 **but I'm addressing a specific (.) a specific concern (.) the idea (.) let's talk in**
- 9047 **general not about your lab or you as a person (.) the idea that a lab does research (.)**
- 9048 **depending on (.) factors that are 90 % not under its control (.) so I have to trust that**
- 9049 **they're giving me (.) everything correct (.) what what do you think about this situation?**
- 9050 77:54 ((Brian)) it's good (.) because you'll have more time to think the experJoannet
- 9051 77:58 **It's good you're saying? I mean if you tell me for practicality (.) I understand**
- 9052 78:05 ((Daniel)) but this is the same situation in all the labs
- 9053 78:08 **Yeah we're not talking about this lab (.) but in general**
- 9054 78:10 ((Brian)) but when you buy
- 9055 78:11 ((Gaelle)) ((laughing))
- 9056 78:13 = **not knowing what's being provided**
- 9057 78:15 ((Brian)) but when you go to the butcher and you buy this meat because you think it's
- 9058 the good one (.) probably it's not the good one (.) and it was not a cow (.) with u::h a deer or
- 9059 something (.) it's the same (.) if you prefer to grow the cow and everything
- 9060 78:32 **I will put the question in a different way (.) in terms of feasibility practicality not**
- 9061 **being able to check everything to produce everything that I understand (.) but now**
- 9062 **think of the idea of relying 90% on other people's work (.) and I have to trust that**
- 9063 **they're doing their job correctly (.) what do you think about this situation**
- 9064 78:56 ((Stephan)) it's a kind of crazy situation (.) it's more or less like a religion like I believe
- 9065 in the manufacturers' but that's it yeah
- 9066 79:05 ((Brian)) it's good it's good

9067 79:07 **You think it's good? It's even positive? You don't even say for example we can't**
9068 **do differently (.) but if you can produce everything and control everything (.) which is**
9069 **better?**

9070 79:17 ((Gaelle)) yeah it's better if you do by yourself because it means that u::h[

9071 79:26 **suppose that you can produce every single thing and control every single thing**
9072 **what is better?**

9073 79:29 ((Brian)) and you still have time to to do research?

9074 79:31 **and you have time suppoee it**

9075 79:34 ((Daniell laughing)) we know it's not possible so::

9076 79:39 ((Brian)) you cannot be good at preparing things

9077 79:41 ((Gaelle)) it will be (.) if (.) but if you're doing in one second (.) like the synthesis (.)
9078 like the quality control and so on (.) in one second and like you still have other to make your
9079 research it's ok (.) but it's not possible

9080 79:57 **Yeah actually I understand when you say (.) that's not possible to do everything (.)**
9081 **so I have to rely on other companies because they're serious professional trustable (.)**
9082 **quality control whatever and we need to save time and keep going (.) that I understand**
9083 **(.) but if you tell me that (.) it's nice to rely on people**

9084 80:20 ((Gaelle)) we can also do:: like mistakes and so on

9085 80:27 ((Stephan)) yeah

9086 80:27 ((Brian)) that is when you buy a computer (.) you prefer to build yourself the computer
9087 or buy it

9088 80:34 **of course I buy yeah (.) it's practicality [**

9089 80:35 ((Brian)) practicality and it will be probably better (.) because you know along the
9090 years that this pre made computer works better than the one that you can build yourself

9091 80:47 **sure yeah (.) for practicality**

- 9092 80:50 ((Brian)) practicality and also the quality you can trust them
- 9093 80:53 ((Daniel)) for practicality
- 9094 80:55 **yes for sure**
- 9095 80:59 ((Gaelle))
- 9096 80:59 ((Gaelle)) it's like electricity (.) it's like for electricity (.) you're paying a lot and don't
- 9097 know why you're paying a lot (.) but you need electricity (.) so you:: ((laughter))
- 9098 81:06 ((laughter)) **yeah (.) ok (.) I understand your point**
- 9099 81:11 ((Brian then everyone laughing))
- 9100 81:13 ((Gaelle)) but if you can produce for your own your electricity and you'll not pay
- 9101 anything and you will not u:h depend on the people you will do it but it's not
- 9102 81:21 ((Brian)) it is like the thing you eat (.) it's better to grow your: your tomato and
- 9103 everything
- 9104 81:25 **Yeah**
- 9105 81:26 ((Brian)) yeah but u:h probably it's better (.) you cannot do it u:h and sometimes it's
- 9106 not better sometimes it's just worse because you don't put the right u:h fertilize[
- 9107 81:40 ((Gaelle)) [yeah it's engrais ((she translated fertilizers into French))]
- 9108 81:42 ((Brian)) [= or the right pesticides and they will be destroyed by warm or so (.) so::
- 9109 81:49 **Ok (.) I got your point but what I meant is that if you are able to do what the**
- 9110 **providers are doing exactly (.) and you still can control everything**
- 9111 82:01 ((Gaelle)) but if [
- 9112 82:02 ((Daniel)) [but of course yes so if you can provide yeah (.) but it's [
- 9113 82:06 ((Stephan)) realizable
- 9114 82:06 **Of course it's not (.) this is why I split the question into two parts (.) first in terms**
- 9115 **of we cannot (.) practicality (.) feasibility (.) we have to do it this way (.) and then (.) the**
- 9116 **drawback of the situation (.)**

9117 82:20 ((Brian)) I don't know (.) I wouldn't be interested to prepare my own products
9118 82:25 ((Stephan)) If I still can use the [
9119 82:27 ((Brian)) because I I know that the products (.) probably people is producing good and
9120 even better than the ones that I I will be able to produce so
9121 82:35 **ok (.) now why do you have to study cancer at the cell level first and then you**
9122 **move to bigger and bigger like tissue and u:h in vivo (.) whereas you always say that in**
9123 **vivo (.) at in vivo level you are often surprised that things don't work in the same way**
9124 **than in vitro (.) so you design your research and then you often are surprised by (.)**
9125 **cancer or cells behave differently in vivo (.) so why you start all the (.) you keep starting**
9126 **from the cell (.) assuming that the cell will (.) understanding how the cell behaves will**
9127 **give us an idea how it will be later (.) but then when you go to in vivo you see it different**
9128 83:22 ((Gaelle)) I think that are different point (.) there is ethic point of view (.) you cannot
9129 use like uh mice::: [
9130 83:29 ((Brian)) [everyday
9131 83:30 ((Gaelle)) everyday and doing what you want with the mice (.) and: there is a second
9132 point that you need to have like more a restricted condition to see something like more
9133 characteristic (.) I
9134 83:43 ((Brian)) I I I think 80% of studies that you do also in mice (.) they don't (.) they're not
9135 translated (.) more than 80 (.) 87% or so(.) they are not translated into humans so:: (.) there is
9136 not like a perfect model (.) the perfect model is in human but hhh then you can't
9137 84:01 ((Daniel)) yes you cannot start u:h
9138 84:04 ((Brian)) yeah ((laughter))
9139 84:06 **but the idea of designing research in such a way that thinking that the smaller (.)**
9140 **we study the smallest and then we go to bigger and bigger (.) is this in itself a good**
9141 **reasoning (.) like for example (.) some say that the whole is not the:: the sum of the total**

9142 **parts (.) so for example if you dismantle a system (.) and then you put it altogether again**
9143 **(.) so it's a different thing (.) it's really not (.) and by understanding the smallest parts**
9144 **that**

9145 84:42 ((Stephan)) well I think in research a lot of studies are still understanding the separate
9146 parts (.) it's the beginning (.) so we need to study the parts themselves (.) even before we
9147 understand the system (.) so we're still at the part level (.) so we have to study at the separate
9148 cell (.) and for other studies maybe they're already going to the whole body and they study
9149 something but (.) they might not understand yet exactly why (.) something is going on

9150 85:09 ((Brian)) you need all the: set up (.) you need the basic models and you need the more
9151 advanced in vivo (.) because for example in vivo you have like there is a protein that is
9152 recognized (.) when you have antibodies and then (.) the tumor reduce (.) but if someone
9153 already in the lab found the structure of this protein (.) you'll have the chance to design some
9154 inhibitors (.) just by looking at the structure (.) but someone dealing with in a small lab (.) it's
9155 a bacteria or some cells (.) you need all all the all the:: systems

9156 85:44 **but the idea that the cell is like u:h apart (.) like a (.) a piece (.) by itself (.) we need**
9157 **to understand this piece first and then see how it behaves with the other pieces but**

9158 85:57 ((Brian)) you need everything

9159 85:58 ((Stephan)) if you can work from both ends at the same time (.) also[

9160 86:01 ((Brian)) and the protein that you have in your body (.) it will be the same as you have
9161 in the cell (.) so you can study this protein detail (.) where the compound is finding to this
9162 protein or

9163 86:13 **but understanding it separately (.) not in its environment (.) is this not**
9164 **misleading?**

9165 86:21 ((Brian)) the you go to in vivo and the you see the way it's not interacting but because
9166 may be the protein there is changing the pH and there is a change in the conformation and its
9167 environment (.) so of course there is uh

9168 86:36 ((Stephan)) well I think that's people stu: (.) you have people studying in humans some
9169 stuff (.) you have other people studying it at the cellular level (.) and (.) by reading each other
9170 literature it's (.) you combine both (.) actually (.) indirectly

9171 86:51 **who is orchastrating these (.) I think researchers are doing (.) you know all sorts**
9172 **of research (.) everyone is doing[**

9173 86:58 ((Stephan)) there is no big worldwide collaborate (.) not yeah (.) may be you have
9174 some projects in which you are combining clinicians and (.) like biologists who are working
9175 on one and the same project (.) but I think worldwide everybody is pooling on the stuff at the
9176 same time

9177 87:16 **ok you got me to the next question which is about multidisciplinary and**
9178 **involving everybody (.) so why you always say that you like or you want**
9179 **multidisciplinary and that even at earlier stages of your research you need to design**
9180 **your research with the participation of other specialists (.) why it's not the case in the:**
9181 **in the most of the labs for example (.) in this lab (.) there a no doctors except the two**
9182 **doctors who work in the other lab but you do not really design together (.) u:h the**
9183 **research (.) although you know that it's very important**

9184 87:55 ((Gaelle)) I think they are trying to have more and more doctors implicated and even
9185 some congress they ask doctors to come (.) and u::h to try to

9186 88:08 ((Brian)) we don't ((laughter)) it's important

9187 88:11 ((Stephan)) Yeah in my project we also have clinicians in u::h involved also so

9188 88:15 ((Brian)) ((inaudible))

9189 88:16 ((Stephan)) but yeah you need to have mixed population in your group to avoid this (.)

9190 and that you can

9191 88:26 **so do you all confirm that it's important to involve clinicians for example or**

9192 **epidemiologists or nutritionists right from the beginning to design the research?**

9193 88:36 ((Stephan)) depending on your project (.) what you want to study (.) some times

9194 88:39 ((Brian)) sometimes you need some times you don't need (.) or very basic

9195 88:45 ((Gaelle)) I think it's like ((all speaking at once inaudible)) if you want to:: like test like

9196 u::h inhibitor of something (.) may be it's interesting to have like u:h the:: input of a clinician

9197 (.) but as Brian said if you want to just u:h see the interaction between two proteins (.) they're

9198 not needed to::

9199 89:10 **seeing the interaction between two proteins can be the topic of the whole research**

9200 **or part of it?**

9201 89:15 ((Stephan)) could be

9202 89:16 ((Brian)) yeah could be the whole research ((overlap inaudible)) how this protein also

9203 link to this

9204 89:21 ((Gaelle)) because after it will lead to something another question (.) another question

9205 and maybe like: 15 years later (.) it will become more close to clinical practice and then may

9206 be the clinician would be::

9207 89:34 ((Brian)) interested

9208 89:34 ((Gaelle)) interested in

9209 89:35 ((Brian)) interested in your work

9210 89:36 ((Daniel)) it depends how you design your project at the at the beginning (.) even if it's

9211 u:h basic research like studying the interaction between two proteins (.) maybe you have

9212 already in mind that (.) to have u::h therapeutic u::h implication so you (.) we already involve

9213 clinicians so (.) so it depends how you want to

- 9214 90:00 **so for example you said that if you want to study or understand the interaction**
- 9215 **between two proteins (.) u:h you wouldn't need u:h**
- 9216 90:09 ((Stephan)) it depends
- 9217 90:11 **but it's still working (.) in this case you would not need to ((someone pointed at my**
- 9218 **recorder so I said is it recording?))**
- 9219 90:17 ((Stephan)) I think it's still recording
- 9220 90:19 **ah I hope so hhh yes ok (.) so you said that if it's very basic for example you want**
- 9221 **to study the two proteins u:h interaction (.) may be in that case you would not need u:h**
- 9222 **right you would not need a clinician**
- 9223 90:35 ((Gaelle)) not directly (.) but
- 9224 90:37 ((Daniel)) it depends if you are studying this interaction (.) because at the end you
- 9225 suspect a role u:h in therapeutic response or something like that (.) and you know that
- 9226 probably at the end of the project you: you will translate u:h
- 9227 90:52 **yes**
- 9228 90:53 ((Daniel)) you need clinics so:::
- 9229 90:56 **so then you would[**
- 9230 90:58 ((Daniel))[yeah we we would u:h cooperate and collaborate with uh clinicians and uh
- 9231 91:03 **or the clinicians can even say that you don't need to do this research because you**
- 9232 **know that this in vivo works in this way (.)**
- 9233 91:15 ((Gaelle)) may be (.) it could be
- 9234 91:17 ((Brian)) and also you have everything is (.) published
- 9235 91:20 ((Daniel)) yeah so::
- 9236 91:22 ((Brian)) you can check already if this protein is important for this disease or not
- 9237 91:26 **everything is published?**
- 9238 91:27 ((Brian)) not everything but u:h if they find something they

- 9239 91:34 ((Daniel and Brian speaking at the same time; inaudible))
- 9240 91:36 ((Daniel)) yeah we have access to: to this
- 9241 91:40 ((Brian)) but yeah I think I think it's important to have the another view
- 9242 91:45 **so why is it still not not that common to involve everyone right from the beginning**
- 9243 **and you know keep saying it's important but not doing it and then be stuck at the level**
- 9244 **of the in vivo?**
- 9245 91:58 ((Brian)) because it's difficult to make them to understand what we're doing and to
- 9246 know what they are asking sometimes it's very different mind
- 9247 92:09 ((Gaelle)) and sometimes they have not the time ((laughter))
- 9248 92:11 ((Stephan)) or not
- 9249 92:13 **no no I'm talking about restructuring the whole body how it works (.) how it**
- 9250 **functions (.) I'm talking about restructuration completely**
- 9251 92:22 ((Gaelle)) yes but you have to take into account also:: the time of (.) the time table of
- 9252 the: the: clinicians
- 9253 92:31 **I mean clinicians would right from the beginning all the time be recruited in labs**
- 9254 **that are constantly multidisciplinary**
- 9255 92:38 ((Brian)) but if they are in the lab they're not in the: hospital (.) so they wouldn't have
- 9256 the feedback
- 9257 92:44 **why they need to be in a hospital all the time some of them need to be in labs like**
- 9258 **you**
- 9259 92:48 ((Brian)) but if they are in the lab with me (.) they will be like me
- 9260 92:52 ((Gaelle))
- 9261 92:52 **yeah but from their perspective (.) their doing the job from their perspective (.)**
- 9262 **I'm talking (.) I'm thinking (.) I'm rethinking the structure of how it works**
- 9263 93:00 ((Brian)) you have

9264 93:01 ((Stephan)) like somewhere it's like that (.) they're like spending like 2/3 of their life in
9265 the clinic and 1/3 in the research (.) it's being done
9266 93:12 **yeah for example (.) this way how it works how it is designed (.) not think of them**
9267 **like their natural place is the hospital and your natural place is here (.) and they will (.)**
9268 **whether they will have time or not to visit (.) I mean how it works in research in general**
9269 **it would be completely different all the time together may be (.) may you still need**
9270 **clinicians working in the hospitals and some biologists**
9271 93:34 ((Gaelle)) but there are clinicians who are doing research
9272 93:36 **there are?**
9273 93:38 ((Gaelle)) clinicians who are doing research for example if you go in the cardio lab or
9274 in the down stair (.) downstairs they are all clinicians the PI (.) for example (.) I think so
9275 93:48 **who are working in cardiology?**
9276 93:49 ((Gaelle)) yeah (.) I mean even in u:h (.) team I think that the 3 PI here are
9277 93:58 **that's for the cardiology right? heart diseases?**
9278 94:01 ((Brian)) but Michel is physician (.) but is not cardiologist so
9279 94:04 ((Gaelle)) uhm
9280 94:05 ((Brian)) in this sense you (.) it's like he was like ()
9281 94:09 **yeah**
9282 94:09 ((Stephan)) but more and more mixed (.) like reinforcement would be a good thing
9283 like here (.) all our meetings there's never any physician from like an oncology clinic or
9284 something (.) and I think that's why we should begin by
9285 94:23 ((Gaelle)) but for example for the committee (.) for the committee usual there are
9286 clinician (.) for example in my committee (.) there are one biochemist and two physicians

9287 94:40 **ok but in terms of everyday interactions and the collective thinking and how**
9288 **knowledge is built within labs and research areas (.) is it enough to just have a**
9289 **committee uh**
9290 94:53 ((Stephan)) here it's not enough
9291 94:53 ((Gaelle)) it's not enough (.) but it's not also necessary to have each day (.) a contact
9292 with a physician
9293 95:01 **well the physician**
9294 95:01 ((Gaelle)) you don't need a physician to:: make like western blot or something like that
9295 (.) I think it's important in the beginning of the project (.) may be to see like after some::
9296 months (.) to see the evolution and see what
9297 95:17 **but I have a problem with this way of u:h (.) this is a compartmentalized way of**
9298 **studying the thing (.) you at the same time**
9299 95:26 ((Gaelle)) but why you want a physician everyday in the lab?
9300 95:29 **not necessarily to be doing western blot she can be working on something on a**
9301 **different project (.) but she is there**
9302 95:34 ((Stephan)) they could give more like scientific input on a daily or more regular base
9303 (.) like what I had in my previous job also (.) there was like in our (.) our boss he was
9304 clinician also (.) he was mostly in the clinic but every week we had a meeting and (.) you
9305 have also two clinicians in our lab (.) because work on the question that is directly related to
9306 the human so
9307 95:58 ((Gaelle)) but there are physicians in man (.) in many labs (.) you have Sophie (.) Sonia
9308 (.) Michel there was Myriam you can (.) ask them questions (.) if
9309 96:08 ((Stephan)) but I think also here it would be good to have more more relations also
9310 with oncologists because then you also get more interest of like (.) they're more directly
9311 implicated in things and I think

- 9312 96:21 ((Gaelle)) but if you want you can send them email to them and ask
- 9313 96:25 ((Daniel)) and before there was Manu
- 9314 96:27 **but is it enough to send an e-mail to ask a question? or to be constantly**
- 9315 96:30 ((Gaelle)) no but if you want u::h another view of your project and see what this
- 9316 applicable to or transcriptible to clinic (.) you can:: ask them and I think they will be ok if you
- 9317 go
- 9318 96:44 **ok because this sounds like it's it's like**
- 9319 96:48 ((Gaelle)) but for sure it's necessary to have an input of the u::h what they know
- 9320 96:54 **yeah I mean (.) what what I'm especially thinking about is to think collectively**
- 9321 **about things all through the research not just you know (.) different PhD or post docs**
- 9322 **doing their projects (.) and then ok may be I'll take this person's advice or (.) no (.) I**
- 9323 **mean everybody is thinking**
- 9324 97:12 ((Stephan)) you need to have like cross fertilization
- 9325 97:15 **cross?**
- 9326 97:15 ((Stephan)) Cross fertilization
- 9327 97:16 **Yes like everyone is all the time (.)**
- 9328 97:18 ((Brian)) Yeah I think so
- 9329 97:19 **implicated in**
- 9330 97:21 ((Brian)) in everything
- 9331 97:22 ((Stephan)) but at least also like it's research (.) it would be good if we also could go to
- 9332 like oncology meetings and listen to like (.) what's the stories in the clinic (.) what's playing
- 9333 what are the
- 9334 97:32 ((Gaelle)) but are already it's
- 9335 97:33 ((Stephan)) if you have an important question

- 9336 97:34 ((Brian)) so we can suggest something (.) we can suggest for example change the pH in
9337 this tumor or so::
- 9338 97:39 ((Stephan)) Yeah something like that
- 9339 97:41 ((Brian)) or something like that
- 9340 97:41 ((Stephan)) and it would be interesting to see the response of this (.) if we measure this
9341 and hh
- 9342 97:47 **ok (.) do you trust that oncology is going in the right way or do you think that**
9343 **there are some sort of domination that is getting this field into other directions that are**
9344 **not necessarily correct?**
- 9345 98:03 ((Gaelle)) no
- 9346 98:03 ((Brian)) it's going well
- 9347 98:06 ((Stephan)) people are living longer so ((laughter))
- 9348 98:05 **what did you?**
- 9349 98:06 ((Stephan)) people live longer nowadays with cancer so we're doing something good
9350 hh
- 9351 98:13 ((Brian)) there are some treatments that work (.) yeah improving the life of people so
9352 98:17 ((Daniel)) we are also able to detect cancers earlier it's good also
- 9353 98:24 **((I addressed the question to Gaelle)) you agree?**
- 9354 98:25 ((Gaelle)) Yes the end point of the people is to find something against cancer (.)
9355 so there will not go through something which is not interesting (.) I think
- 9356 98:35 **ok now do you think that oncology and research labs are dominated by**
9357 **commerce? like providers for example? Is there this domination?**
- 9358 98:49 ((Stephan)) ↓ I don't have that
- 9359 98:50 ((Gaelle)) but they: push people to study something special or?

9360 98:55 **no (.) like for example there things that you know (.) ideas that they are really**
9361 **through marketing you need (.) you need (.) you feel like (.) you are able to not to buy**
9362 **from them because you know that they're just saying bullshit (.) but at the end you're**
9363 **constantly hearing these things all around and you hear other labs doing this (.) when**
9364 **you travel you see other labs (.) you say look at these labs (.) so at the end are you not**
9365 **dominated by the: commercial**

9366 99:23 ((Brian)) no

9367 99:24 ((Daniel)) no

9368 99:24 ((Stephan)) I'm not[

9369 99:24 ((Brian)) = probably you see something but u:h that you think it's interesting (.) to do in
9370 your research but it's not commercial it's something that you think ok this is make sense and I
9371 will late try also (.) in my lab but uh (.) ↑ it's not commercial (.) it's like (.) ideas that you pick
9372 from

9373 99:44 ((Gaelle)) sometimes you see may see ok you can buy it but if you want to (.) not to
9374 buy it you will not u:h there will not

9375 99:51 ((Stephan)) but there are also more than one company providing you the services (.) so
9376 in that sense it's (.) it's more the interest than the commercial drive and

9377 100:00 ((Brian)) Yeah

9378 100:03 **ok thank you very much than (.) and u::h I hope you enjoyed it ((laughter))**

9379 ((end of recording))