



A plant micro-hydrological journey to phenotypes There and back again ?

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Narratives (n=3)

- « Gatekeeper » cells & aquaporins
- « Hydro-signals » & development
- A multicellular water pump ?

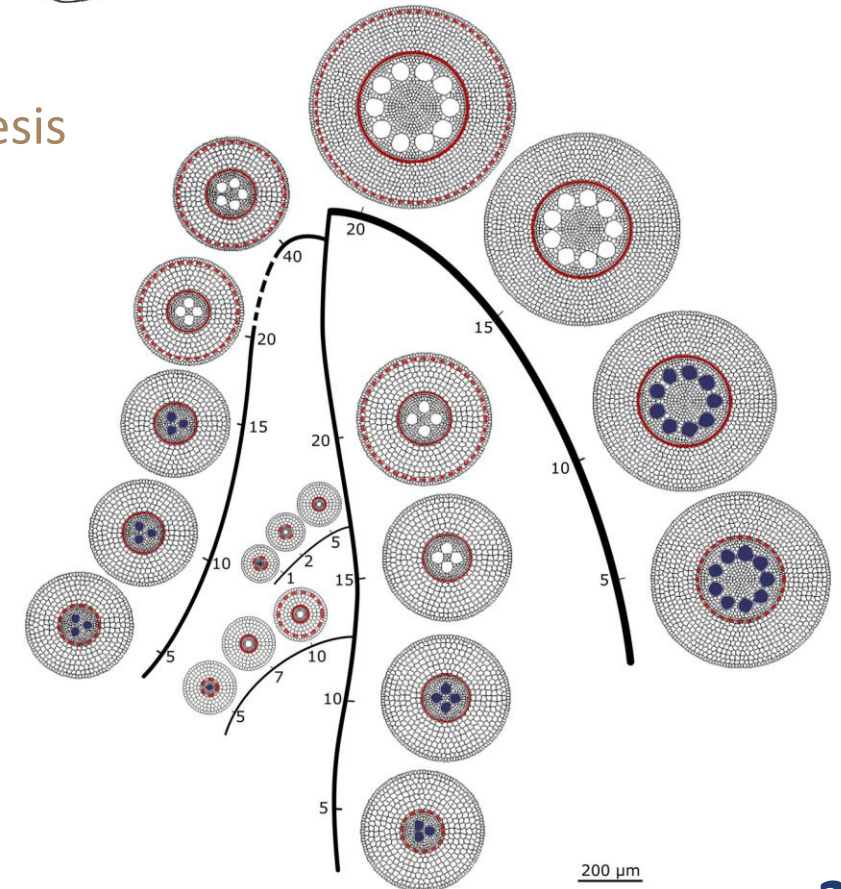
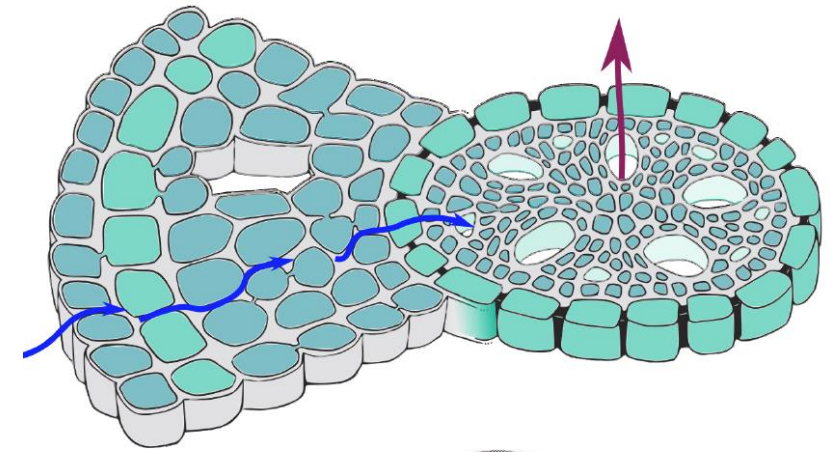


Use of « nexus »

Reject a complex hypothesis

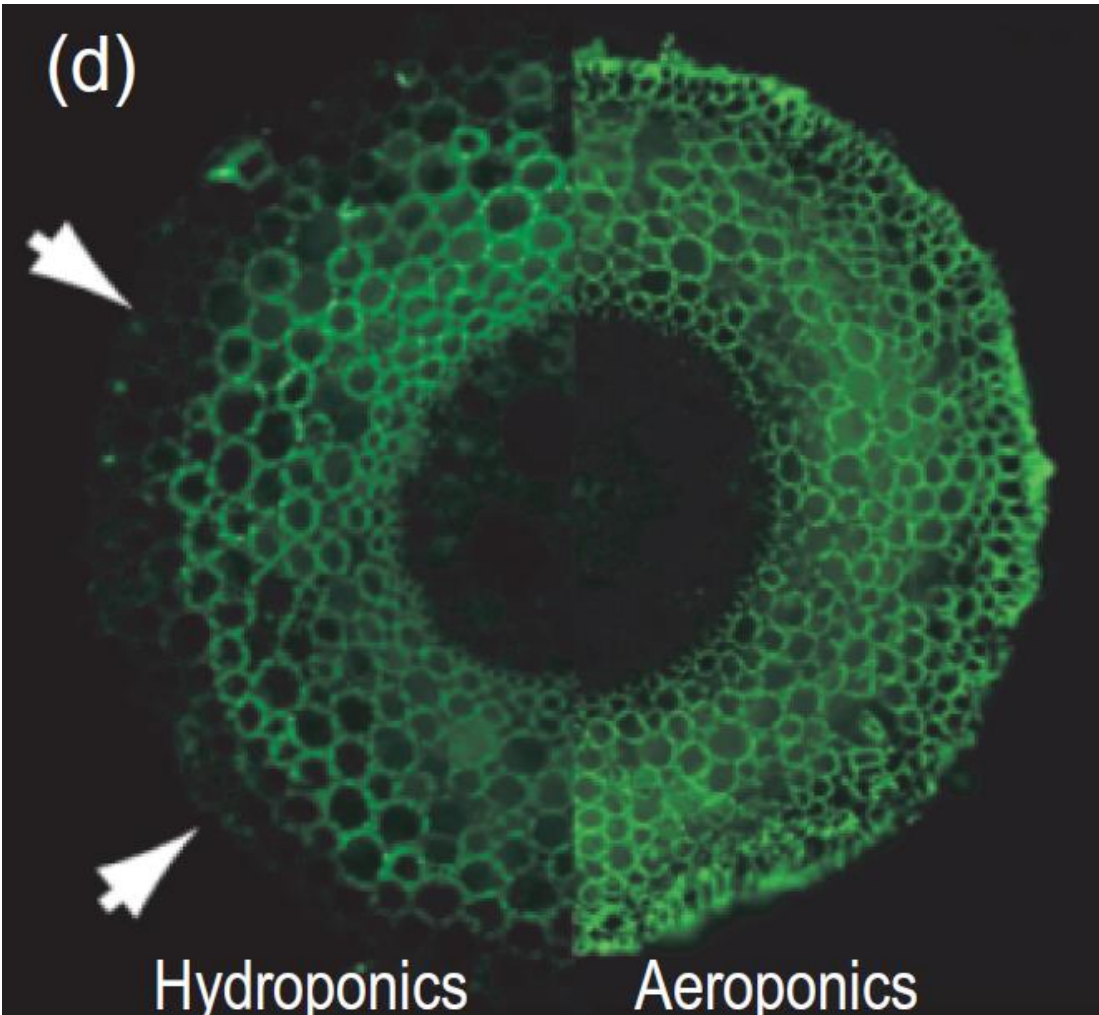
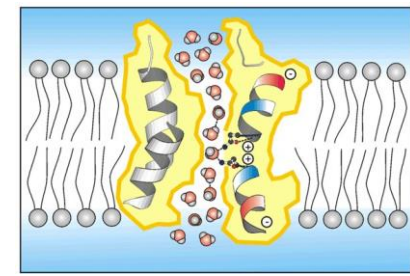
Dissect a process

Explore then experiment

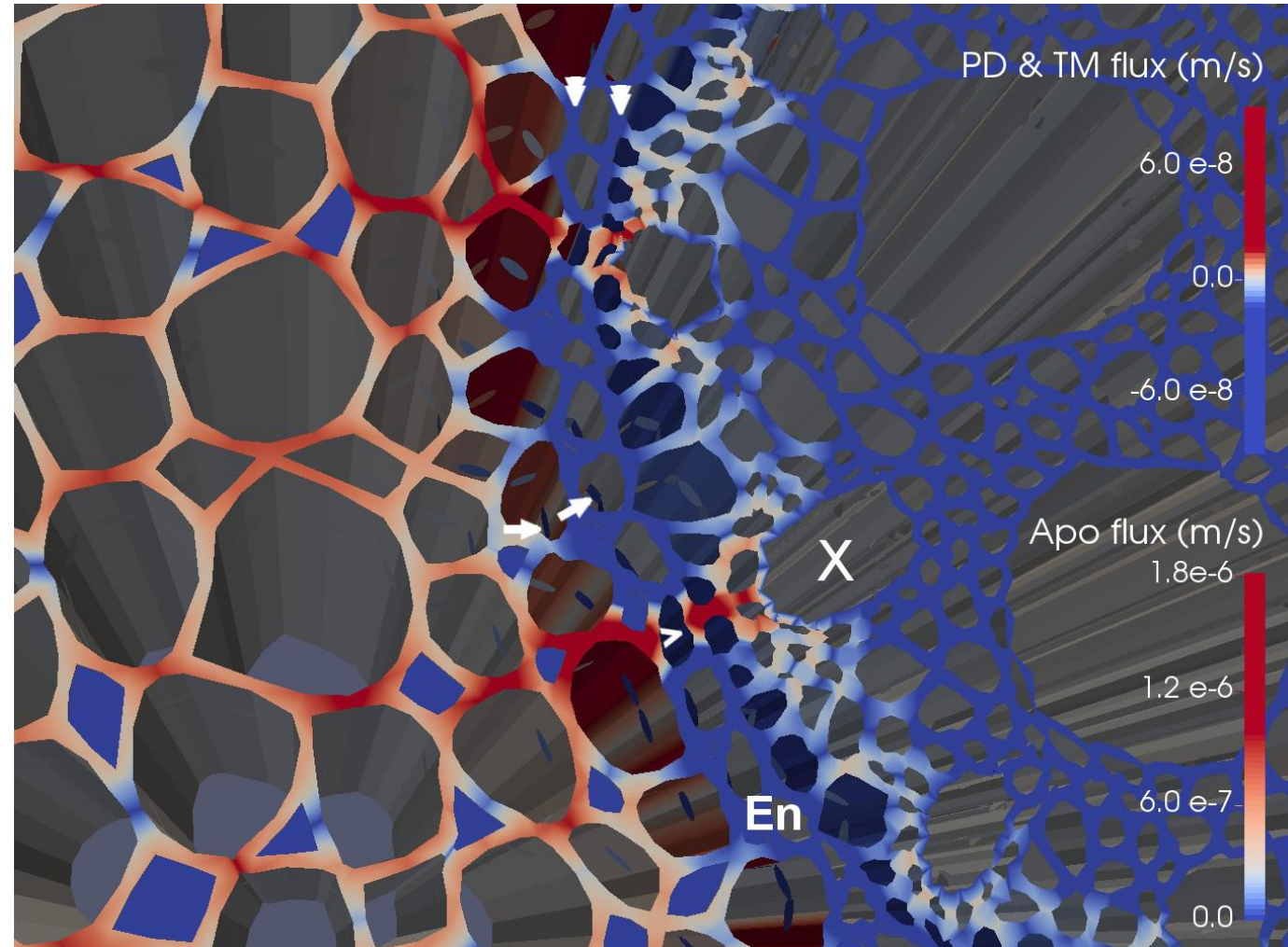


1. Some **aquaporins** are dominantly functional at « **gatekeeper** » cells

Ding et al. (2020) « Modification of the expression (...) »



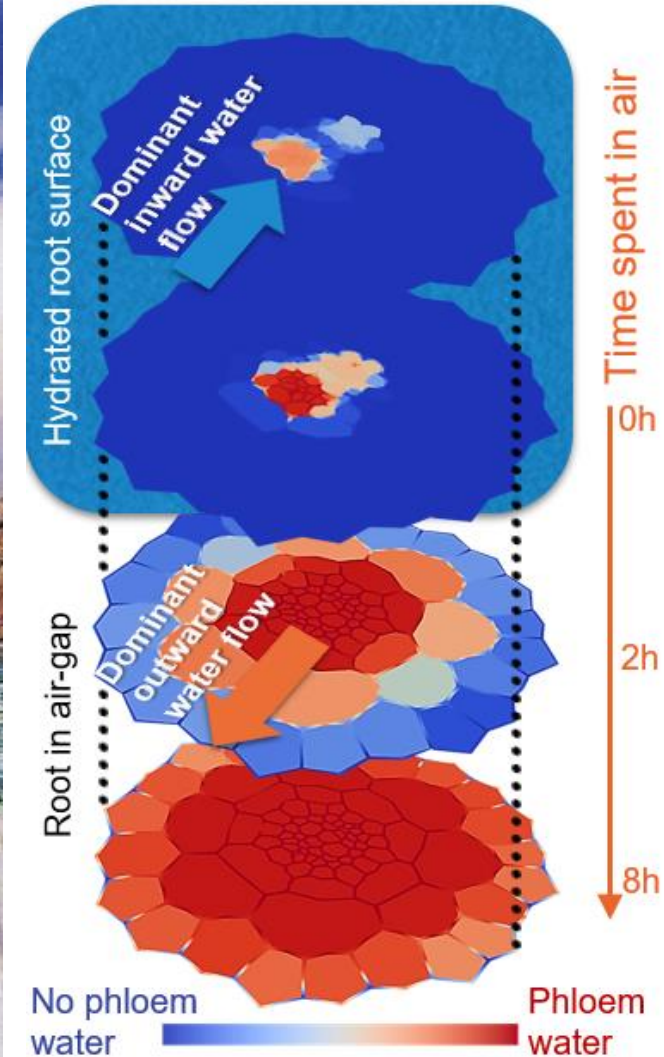
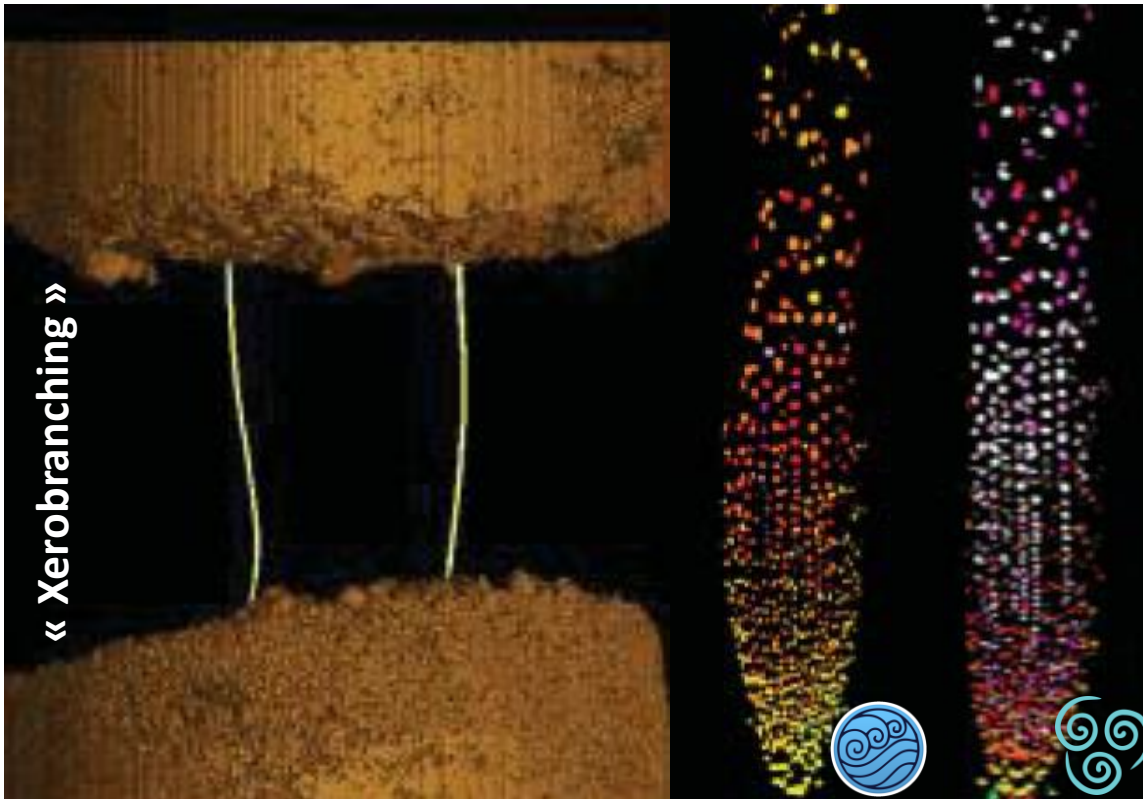
Hachez et al. (2006) « Localization and quantification (...) »



Couvreur et al. (2018) « Going with the flow (...) »

2. « Hydro-signals » may control developmental responses to local water deficit

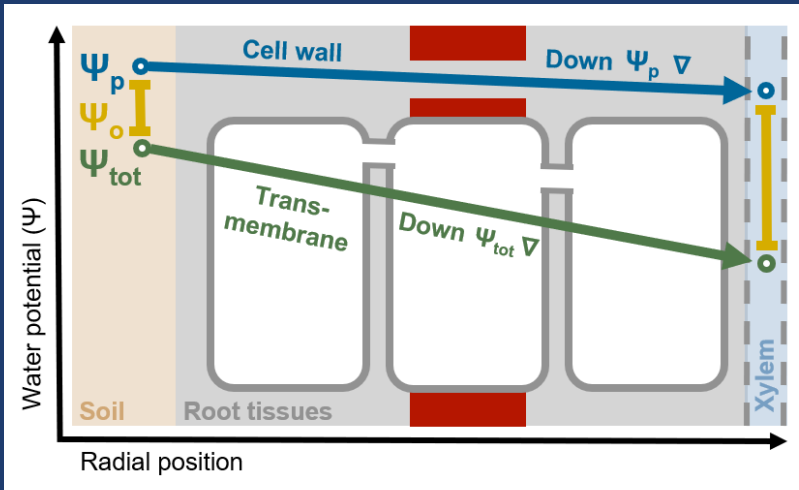
Mehra et al. (2022) « Hydraulic flux-responsive hormone (...) »



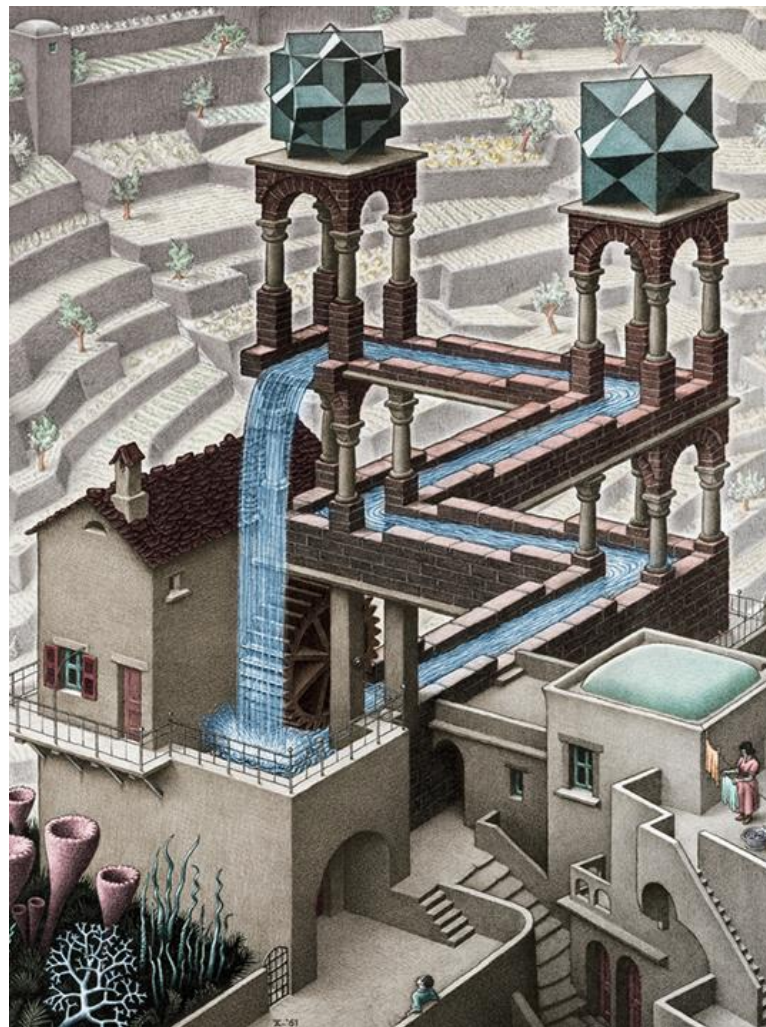
3. Could water flow along uphill gradients of total water potential in plants ?

Couvreur et al. (2021) « Evidence for a multicellular (...) » @ bioRxiv

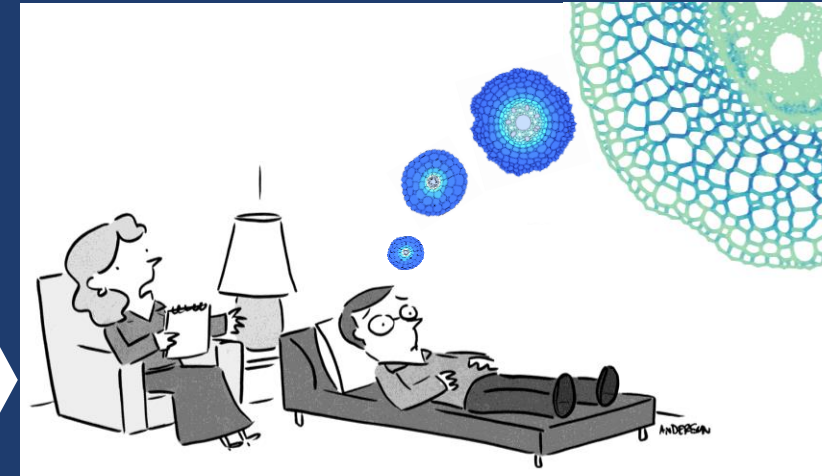
How water flow should be



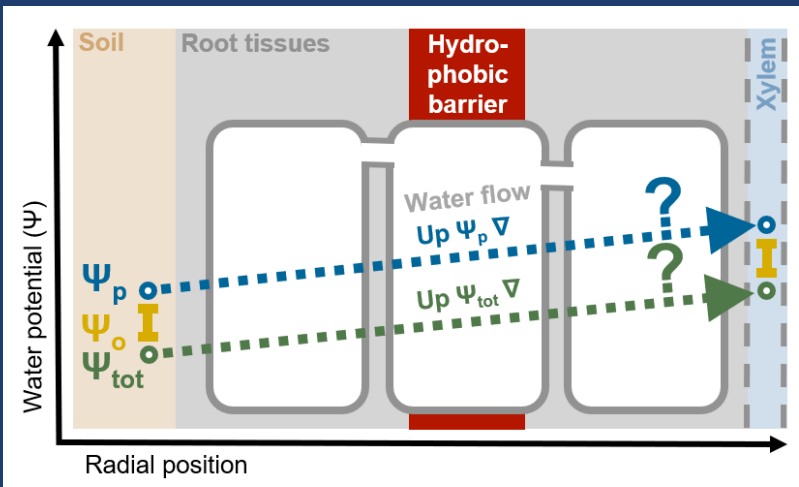
What it looked like



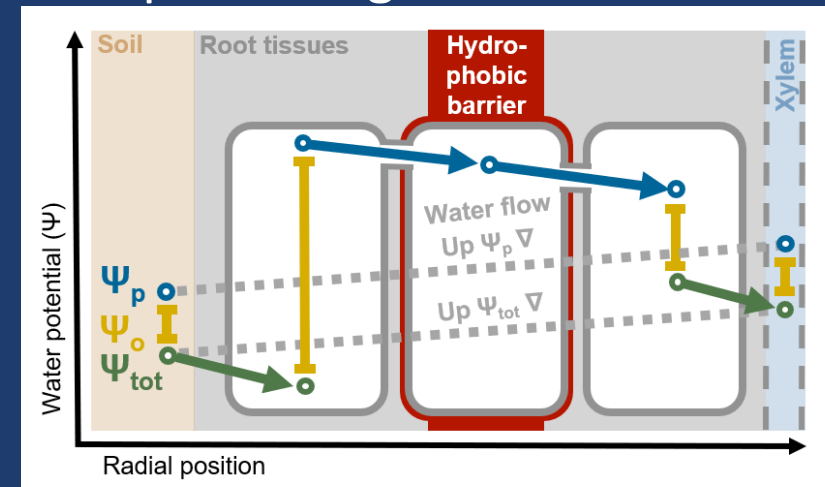
How we have been feeling



What scientists observed

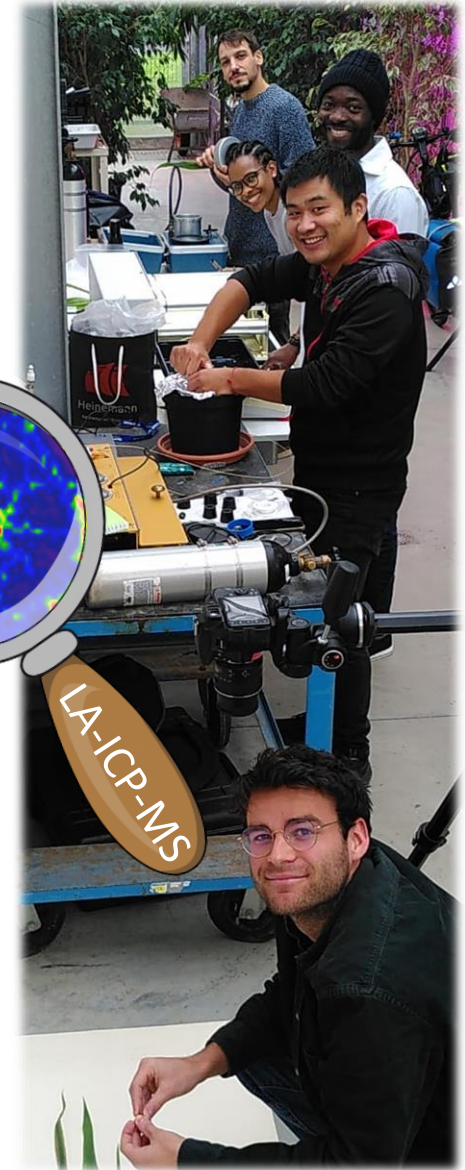
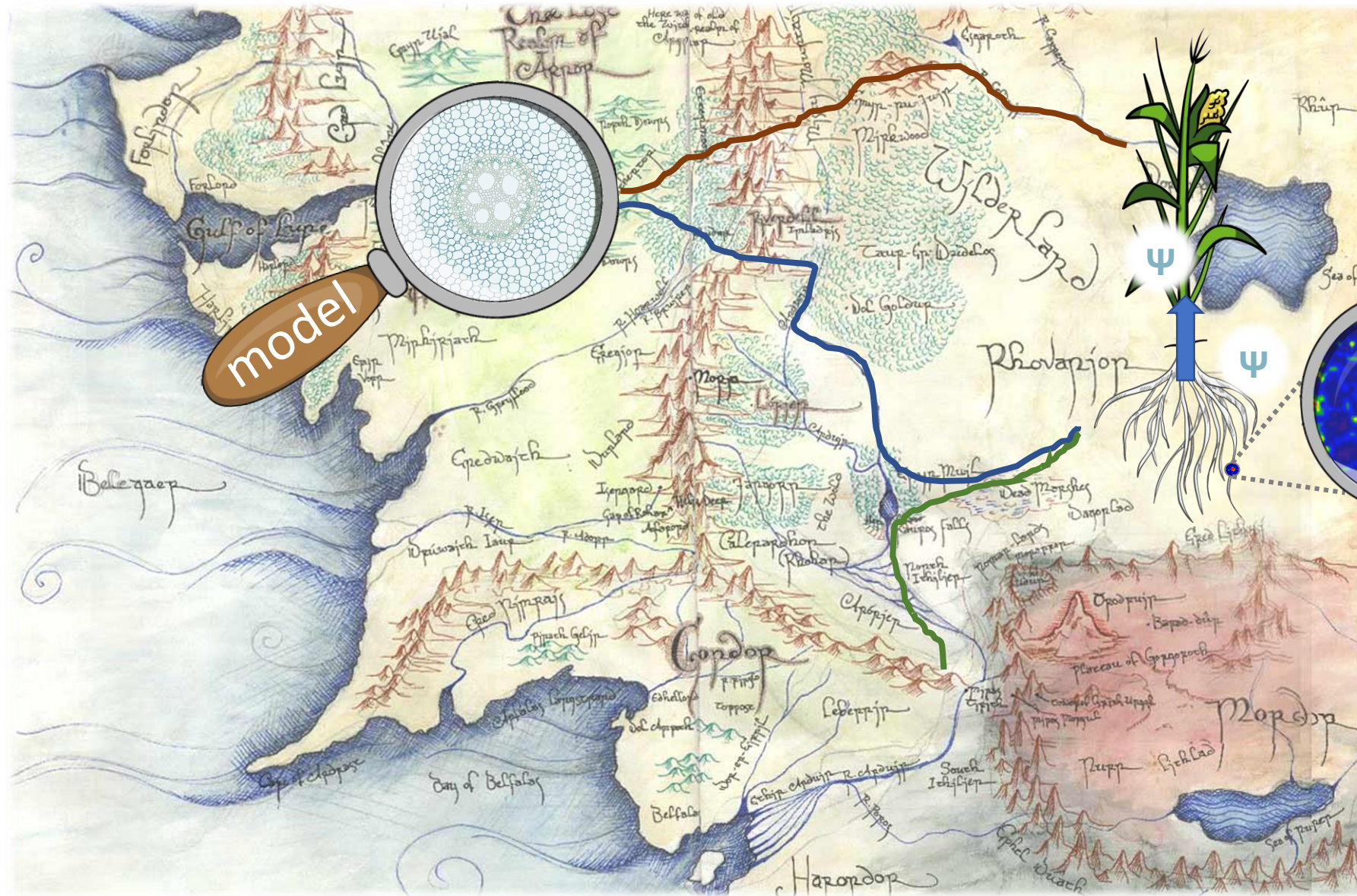


How plants might have tricked us



3. Could water flow along uphill gradients of total water potential across plants ?

Couvreur et al. (2021) « Evidence for a multicellular (...) » @ bioRxiv



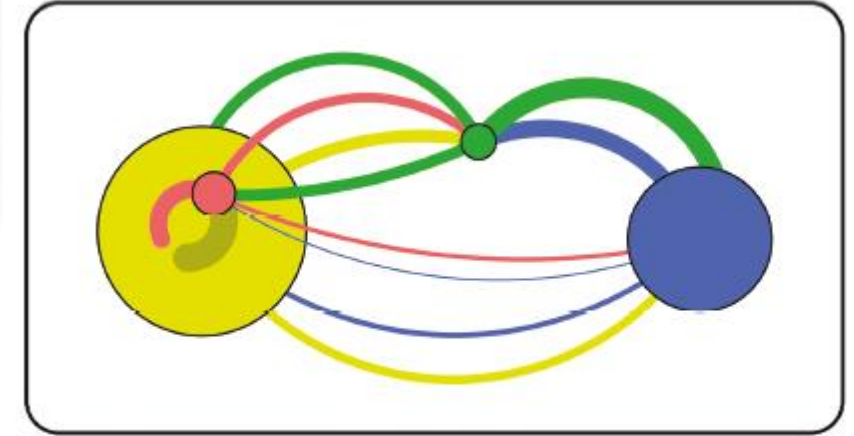


Image analysis

FSPM

Crop models

Phenotyping

Saint Cast et al. (2022) « Connecting plant phenotyping & modelling communities (...) »

Fascinating interdisciplinary narratives ahead ! =)