Maréchal G. (Brussels)

Regione del Veneto Città di Abano Terme APT Abano Terme

3rd Abano Terme Meetings on Rehabilitation

C.N.R.
Consiglio Nazionale delle Ricerche Università di Padova

International Symposium on

Basic and Applied Myology: Perspectives for the 90's

May 30 - 31, 1991

&

European Community Concerted Action HEART
Expert Meeting on

Muscle driven devices for circulatory assistance

June 1st, 1991

Centro Congressi delle Venezie
Hotel Alexander, Abano Terme (Padova), Italy

PROGRAM & ABSTRACTS

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MECHANICAL POWER AND ISOMYOSINS IN TRANSPLANTED SOLEUS MUSCLE OF MICE

Moens, P.D., G. Beckers-Bleukx and G. Maréchal

Dept. Physiol., Univ. Cath. of Louvain, Brussels, Belgium

Ten soleus muscles of C57 mice were orthotopically homotransplanted. The regenerating muscles were isolated one month post-surgery, stimulated in vitro at 20 ^{0}C and analyzed for their proportions in myosin heavy chains. Nine soleus muscles of normal C57 mice matched for age and sex were used as controls. In comparison with control muscles, transplanted muscles developed half the maximum isometric stress (So: 67 ± mN/mm^2 vs 121 ± 8 mN/mm ^{2}), shortened twice faster (velocity constant b of Hill equation: 0.49 ± 0.03 Lf/s vs 1.00 ± 0.11 Lf/s), with unchanged force constant a/So. The changes in myosin heavy chains showed, as expected, a shift toward faster isomyosins: decrease of MHC1, increase in MHC2A and MHC2B. The maximum mechanical power per unit volume [Pmax = So b f(a/So), see equation 1 and equation 2 in Maréchal & Beckers-Bleukx 1990] is similar in transplanted and normal muscle (39 ± 5 µW/mm^3). Thus, transplanted muscle compensates loss of force by increase in velocity constant. Pmax appears to be a physiological parameter so controlled as to remain constant in spite of the large perturbation brought about by the transplantation procedure.

Maréchal, G. & Beckers-Bleukx, G. (1990), in "Muscle and Motility" ,Vol 2,pg 291-7, Maréchal, G. & Carraro, U. Eds, Intercept," Newcastle-upon time.