

EFFETS DE L'OXYDE NITRIQUE SUR LA RELATION FORCE-VITESSE DU MUSCLE STRIE DE SOURIS

Translated from French.

**EFFECTS OF NITRIC OXIDE ON THE FORCE-VELOCITY RELATIONSHIP
OF STRIATED SKELETAL MUSCULATURE OF THE MOUSE.**

MARÉCHAL G., BECKERS-BLEUKX G.

Dept physiologie, 5540, UCL, Brussels, Belgium.

We measured the force-velocity relationship of EDL (Extensor Digitorum Longus) muscles of C57 mouse maintained in vitro at 20 ° C.

We observed that the addition of 10 mM nitro-L-arginine to the bath considerably slowed the shortening velocities under different loads without changing the maximum isometric force. The strength constant a / P_0 was increased from 0.20 ± 0.01 to 0.26 ± 0.01 ($n = 11$; $P < 0.02$) but the velocity constant b on the contrary was decreased by 2.13 ± 0.14 mm / s per mm of muscle length (L_f / s) at 1.76 ± 0.15 ($n = 11$; $P < 0.03$). The maximum contraction rate under zero load V_0 decreased from 10.6 ± 0.4 L_f / s to 7.3 ± 0.8 ($n = 11$, $P < 0.003$). This resulted in a sharp decrease in maximum mechanical power from 215 ± 18 $\mu W / mm^3$ to 156 ± 12 ($n = 11$; $P < 0.01$). Nitro-L-arginine inhibits nitric oxide synthase and probably exerts its effect via an increase in cyclic GMP (Kobzik et al., *Nature*, **372**, 546-548, 1994; Maréchal & Beckers-Bleukx, *J. Muscle Res Cell.Mot.*, **17**, 149, 1996). We believe that regulating the activity of nitric oxide synthase is a new mechanism to quickly adapt muscle power to the physiological demands of exercise.