

EXCITABILITY OF ENGINEERED MUSCLE CONSTRUCTS, DENERVATED AND STIMULATED-DENERVATED MUSCLES OF RATS, AND CONTROL SKELETAL MUSCLES IN NEONATAL, YOUNG, ADULT AND OLD MICE AND RATS.

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Valid measurements of maximum force and power can only be made when *excitability* has been determined and fibers have been excited maximally. The Rheobase ( $R_{50}$ , V/mm) is the minimum stimulus pulse amplitude required to elicit an isometric twitch at half the maximum value ( $P_{t1/2}$ ) and Chronaxie ( $C_{50}$ , ms) is the pulse duration that elicits  $P_{t1/2}$ , when pulse amplitude is  $2 \times R_{50}$ . Our hypothesis was that excitability would be lower for engineered muscle constructs, denervated muscles and muscles of neonates than for stimulated-denervated muscles or control muscles in young, adult, or old rodents. The  $R_{50}$  and  $C_{50}$  were: (1) engineered muscle constructs,  $0.85 \pm 0.06$  &  $0.39 \pm 0.03$ ; and (2) control (EDL) muscles of neonatal (14 days of age),  $0.45 \pm 0.03$  &  $0.86 \pm 0.03$ ; young (1 to 5 months of age) and adult (8 to 14 months of age),  $0.32 \pm 0.02$  &  $0.04 \pm 0.00$ ; and old (28 months of age)  $0.56 \pm 0.11$  &  $0.40 \pm 0.03$  rodents; and (3) EDL muscles of rats denervated for 4 to 7 months without  $2.60 \pm 0.30$  &  $0.70 \pm 0.15$ , or with electrical stimulation,  $0.47 \pm 0.08$  &  $0.04 \pm 0.00$ ; respectively. Excitability is decreased dramatically in engineered muscle constructs and denervated muscles and slightly in muscles of neonatal and old mice and rats. Support: AG10821 & AG06157.

