

## Supplemental Material

### Age-Associated Functional Healing of Musculoskeletal Trauma Through Regenerative Engineering and Rehabilitation

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#### Video S1.

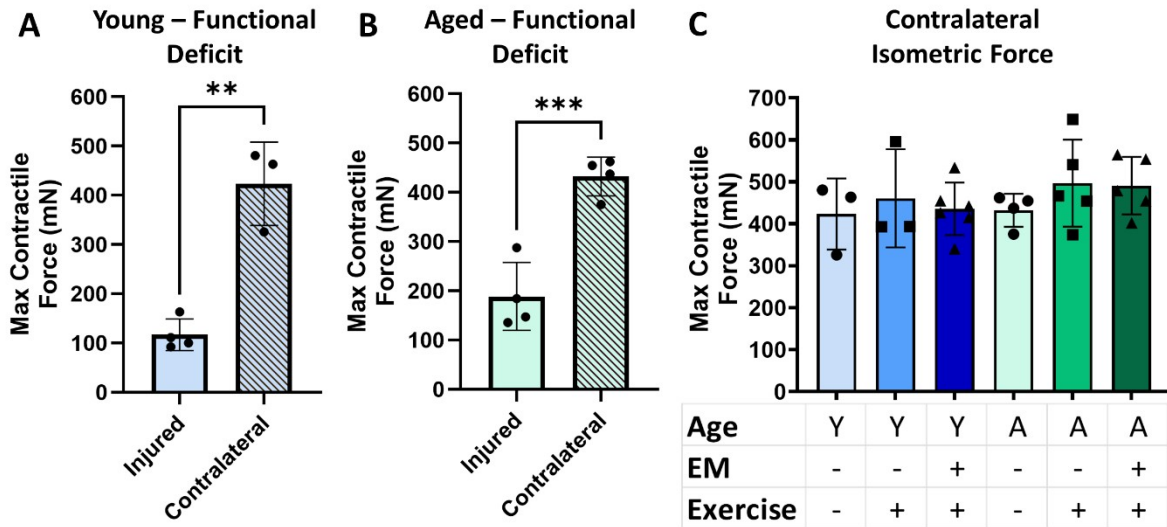
Muscle force contraction of an uninjured contralateral TA muscle in a young mouse during in situ muscle physiology.

#### Video S2.

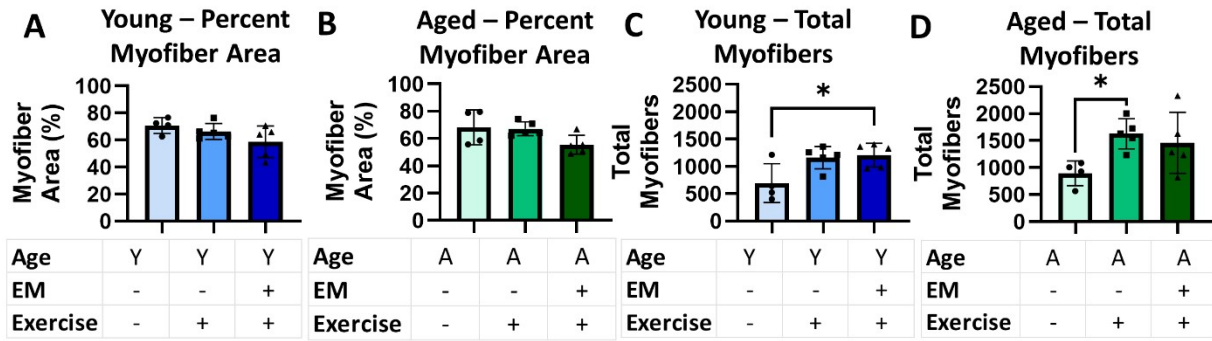
Muscle force contraction of a TA muscle following VML injury and treatment with EM and exercise in a young mouse during in situ muscle physiology.

**Video S3.**

Muscle force contraction of a TA muscle following VML injury in an untreated aged mouse during in situ muscle physiology.



**Supplemental Figure 1. A comparison of muscle function in the contralateral control following VML injury. (A, B)** Maximum contractile force of the injured untreated TA muscle (clear bars) and contralateral TA (patterned bars) in young mice (**A**) and aged mice (**B**) ( $N \geq 3$ ). (**C**) Maximum contractile force of the uninjured contralateral TA muscle in young (blue) and aged (green) mice in the presence (+) and/or absence (-) of EM and exercise ( $N \geq 3$ ). Significance was determined using an unpaired t-test (**A, B**) and a One-Way ANOVA (**C**) with  $p < 0.01$  (\*\*) and  $p < 0.001$  (\*\*\*). Shown are mean  $\pm$  SD.



**Supplemental Figure 2. Total myofiber coverage within the defect site. (A,B)** Quantification of the percent area of the defect site (500  $\mu\text{m}$  radius around the EM region or TA injury site) covered by myofibers in the young (**A**) and aged (**B**) groups in the presence (+) and/or absence (-) of EM and exercise ( $N \geq 4$ ). (**C,D**) Quantification of the total myofibers within the defect site (500  $\mu\text{m}$  radius around the EM region or TA injury site) in the young (**C**) and aged (**D**) groups in the presence (+) and/or absence (-) of EM and exercise ( $N \geq 4$ ). Significance was determined using a One-Way ANOVA with  $p < 0.05$  (\*). Shown are mean  $\pm$  SD.