

**Supplementary Fig. 1.** (A) The biopsy mass removed to create the VML injury is similar in both groups. (B,C) Intramuscular fat was stained using Oil Red O (scalebar=200 μm) and quantified. No differences were observed between groups. (D) Muscle mass normalized to body weight (BW) is significantly higher in sponge treated VML injured muscles. (E) Peak isometric torque normalized to BW trends (p=0.0796) toward improvement with biomimetic sponge treatment. The p-values are indicated on the graphs.