

Vincristine induced delayed body weight gain and stunted muscle growth in pediatric mice

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Background

85% of children diagnosed with cancer are expected to survive their diagnosis. Cancer and chemotherapy contribute to poorer health outcomes. Despite the high survival rate there is minimal research on the influence of pediatric chemotherapy on musculoskeletal physiology. Given that vincristine is a commonly prescribed chemotherapeutic in pediatric populations, the aim of the current research was to investigate the musculoskeletal consequences associated with vincristine in pediatric mice.

Methods

In vitro atrophy and oxygen consumption rate was assessed by exposing C2C12 myotubes with Vincristine (50 μ M). Vincristine was administered (1.5 mg/kg/2x weekly, i.p.) to 4-week-old male C57BL/6J mice. Body mass was monitored daily. Vehicle (n=5) and experimental mice (n=5) were culled after 35 days. Skeletal muscle mass was measured at the completion of the study. *Ex vivo* muscle function testing was completed. Muscle protein expression was measured via western blotting, and gene expression via qPCR..

Figure 1. Vincristine Reduces Myotube Diameter

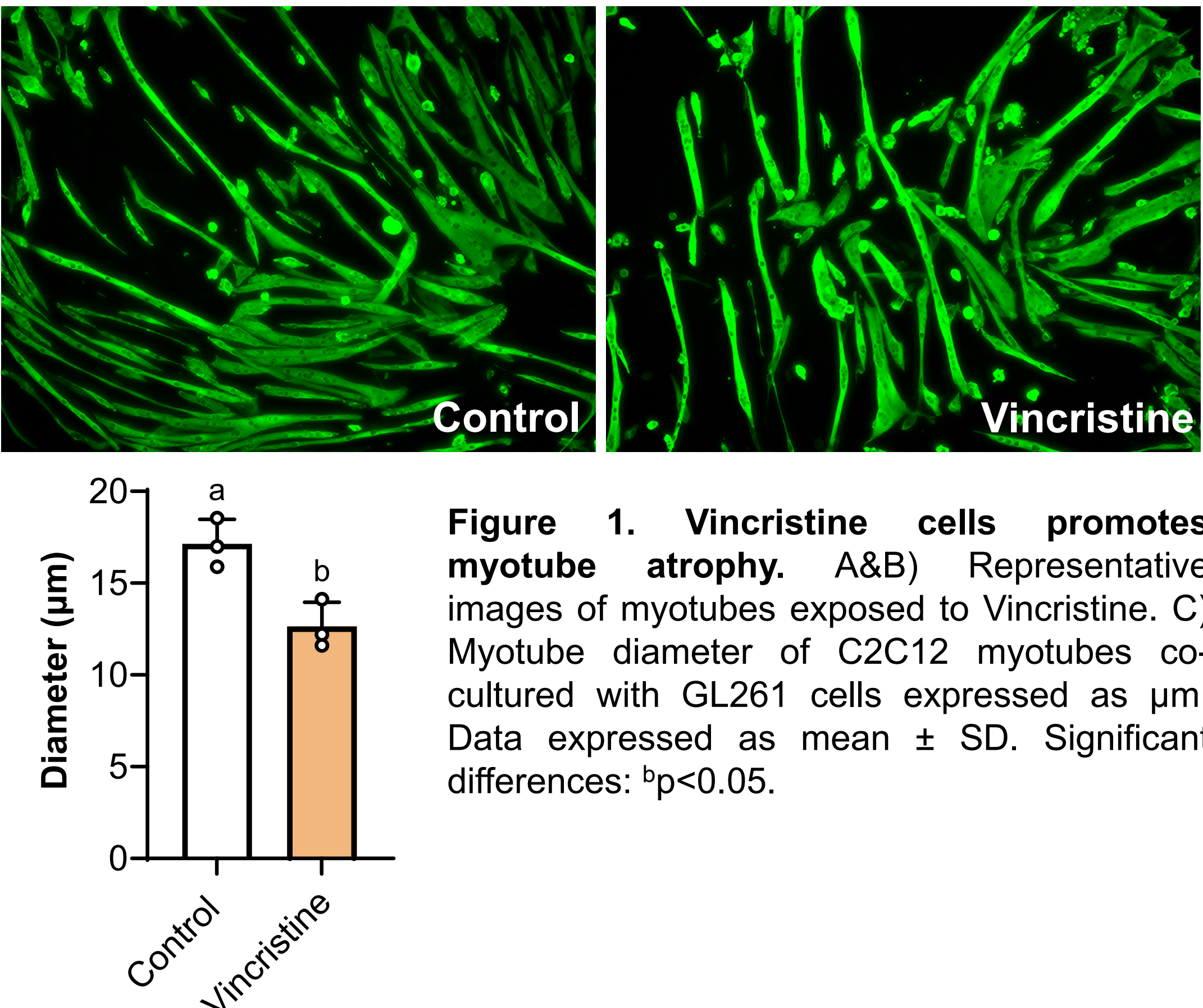


Figure 2. Vincristine Reduces OCR in Myotubes

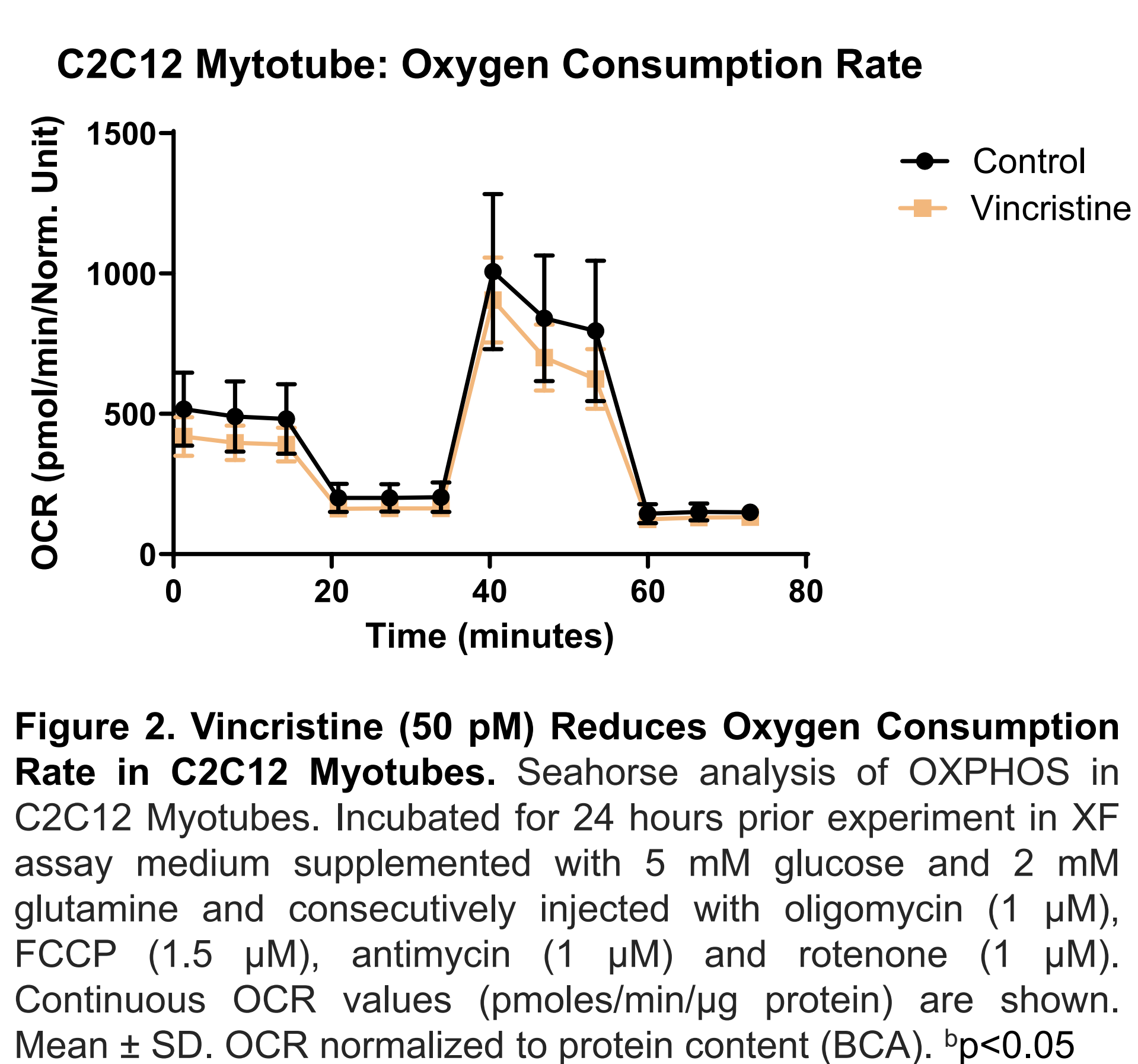


Figure 3. Vincristine Stunts Growth

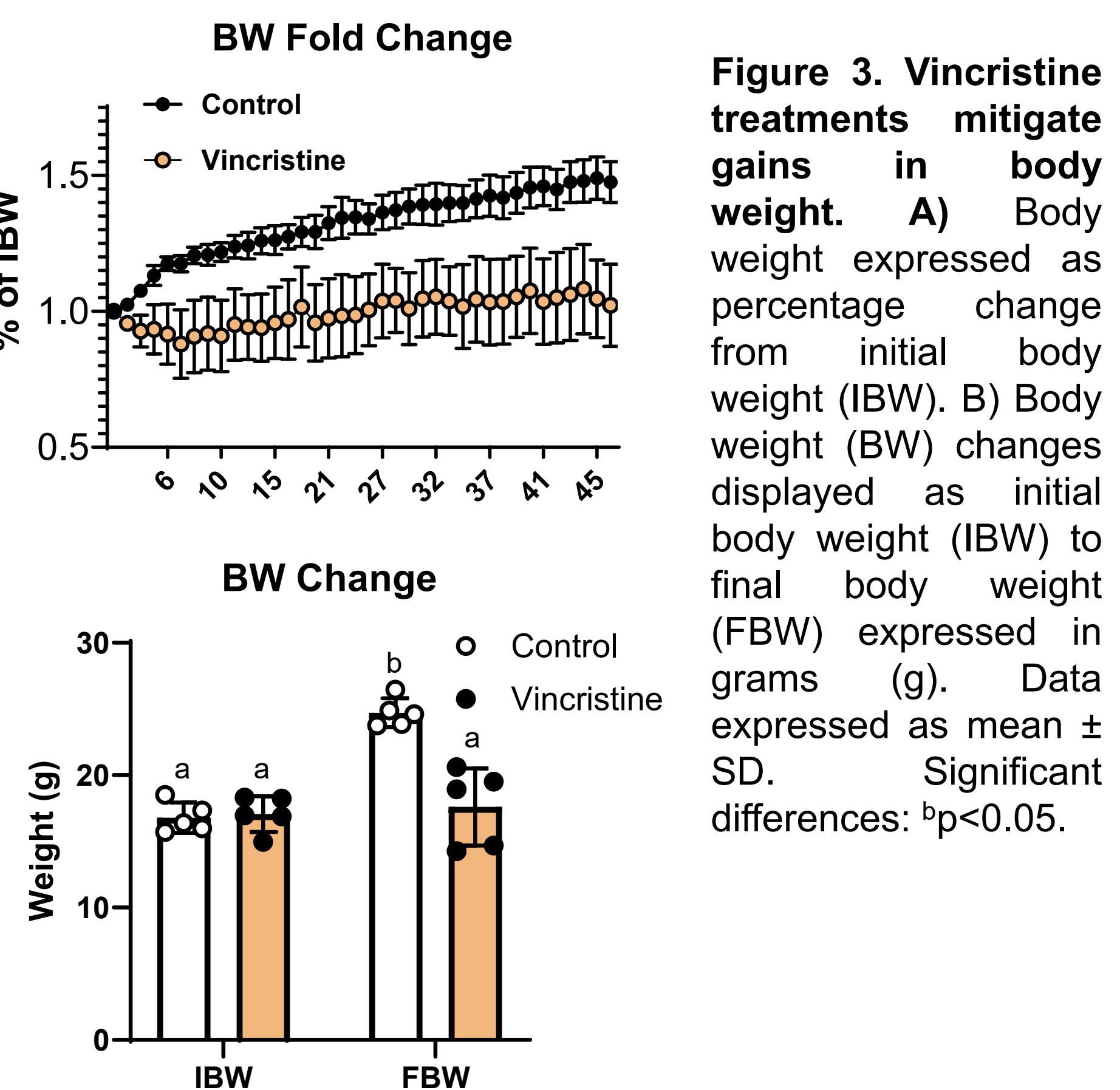


Figure 4. Vincristine Treatments Reduce Organ Size

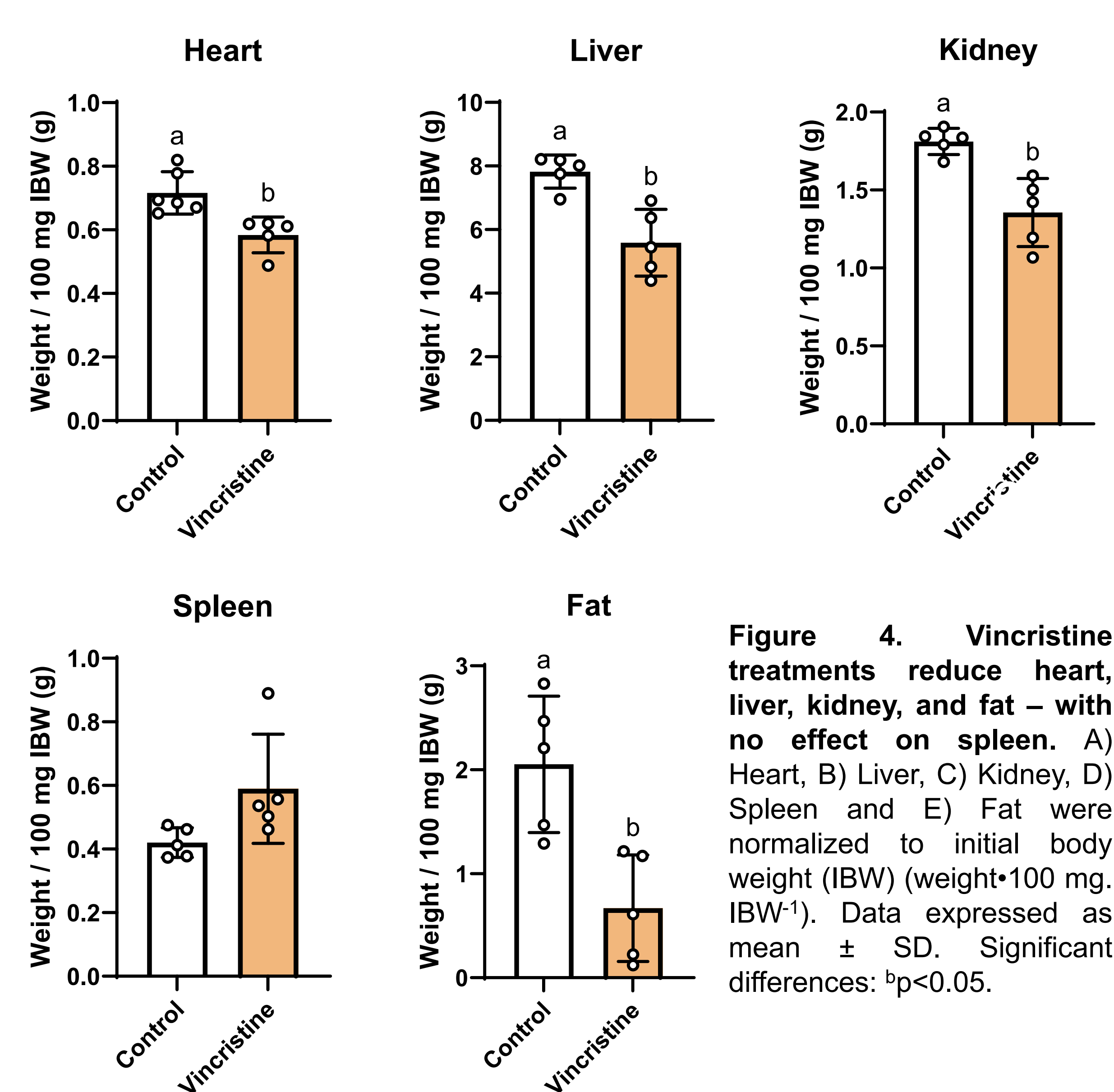


Figure 5. Vincristine impedes muscle growth and reduces muscular force

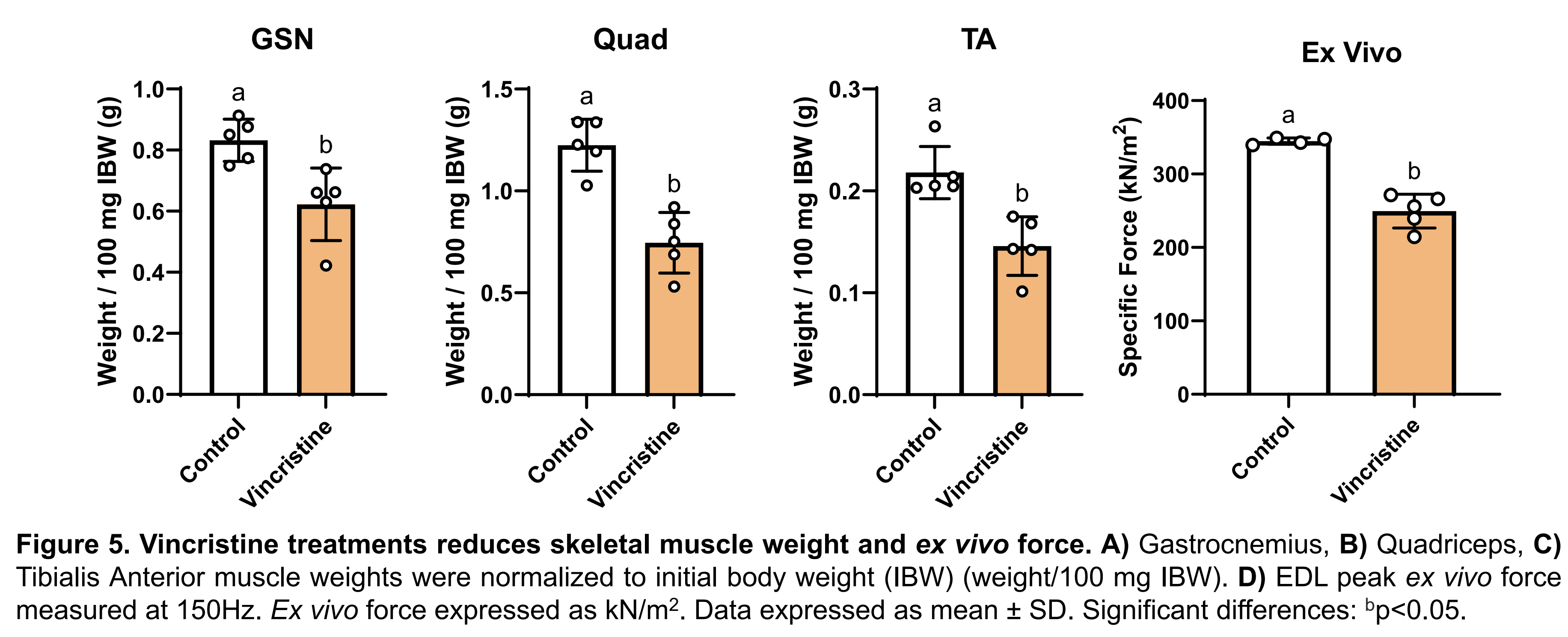


Figure 6. Vincristine treatments shift towards glycolytic fiber type.

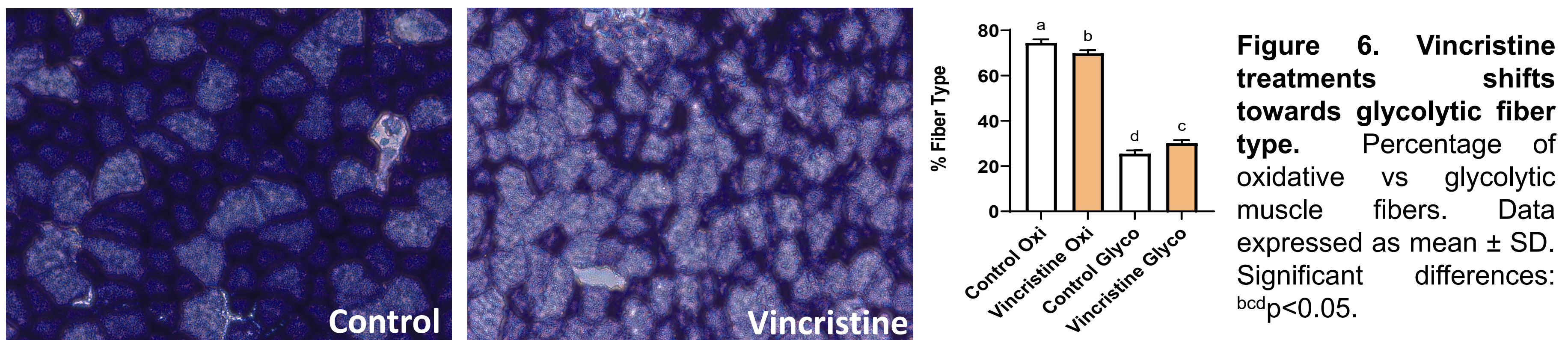


Figure 7. Vincristine Treatments Increase Protein Degradation and PGC1- α protein expression

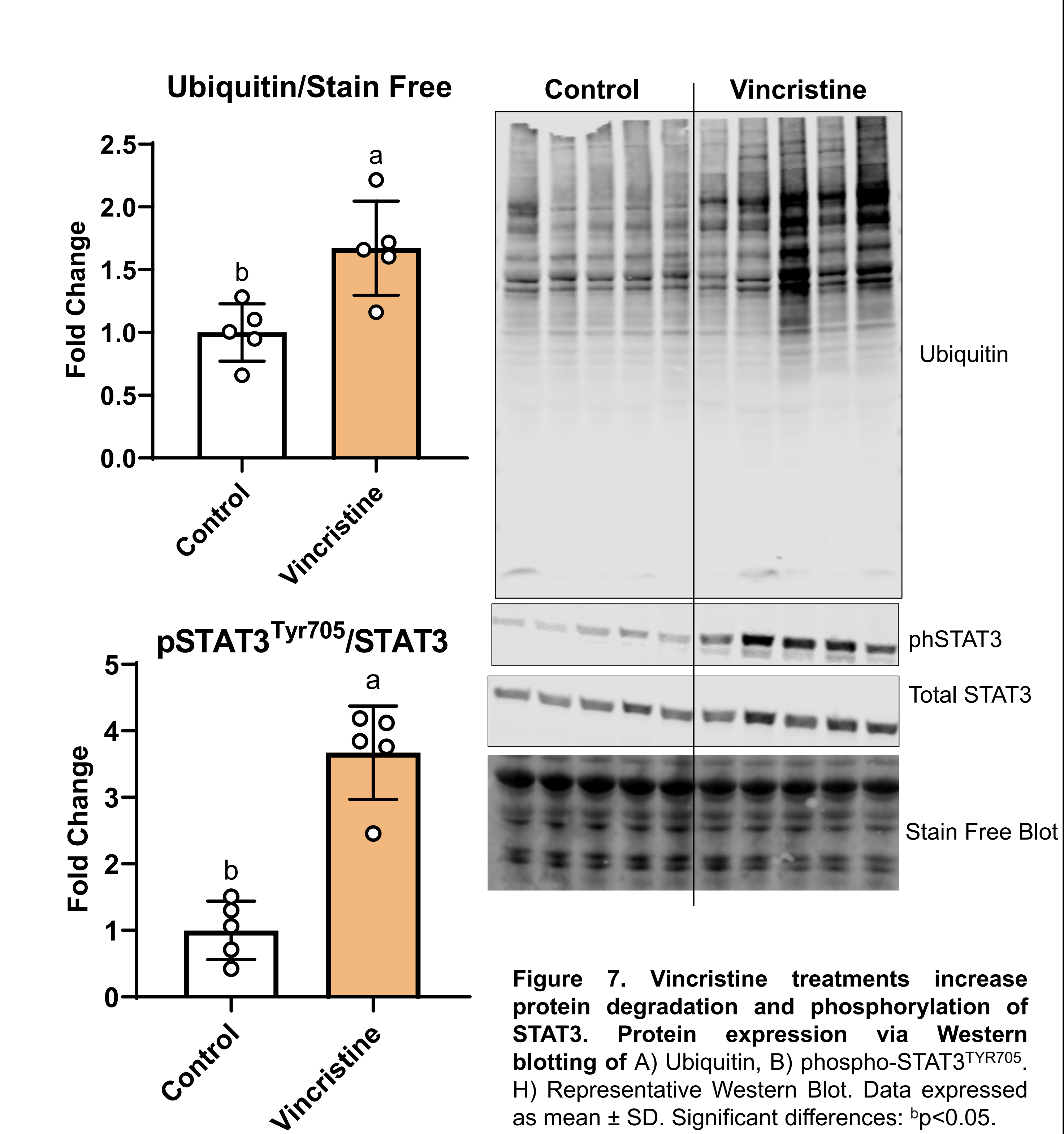


Figure 8. Vincristine induces myofiber atrophy

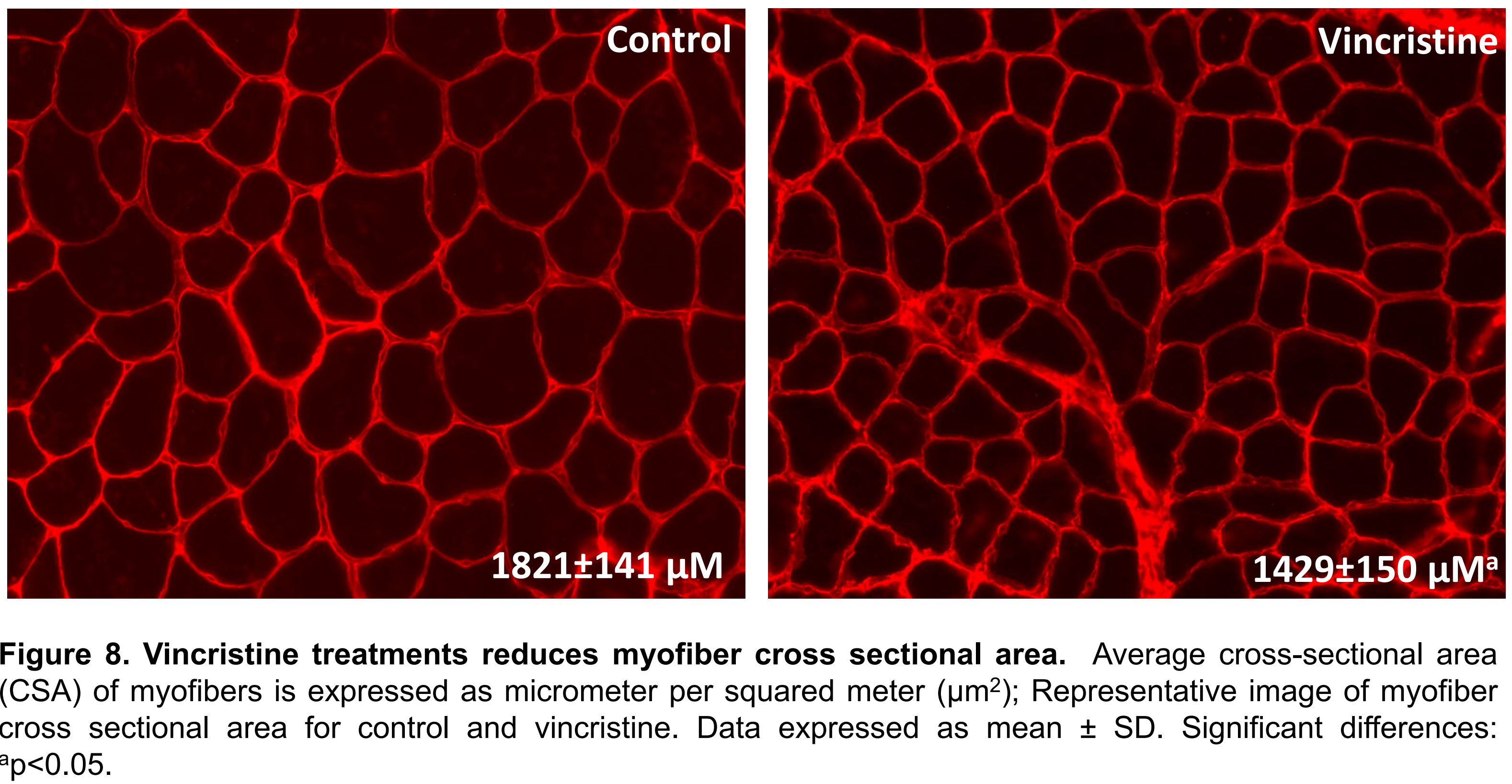


Figure 9. Vincristine treatments yield divergent E3 ligase expression and downregulate PGC1- α gene expression

