**TACSM Abstract**

**Wnt/β-Catenin and Androgen Receptor Signaling Increase Following High Load Resistance Exercise Without Elevations in Serum/Muscle Testosterone or Androgen Receptor Content**

THOMAS D. CARDACI ¹,², STEVEN B. MACHEK ¹, DYLAN T. WILBURN ¹, JEFFERY L. HEILESON ¹, & DARRYN S. WILLOUGHBY ¹,³

¹ Department of Health, Human Performance, and Recreation, Robbins College of Health and Human Sciences, Baylor University, Waco, TX, USA
² Department of Exercise Science, Arnold School of Public Health, University of South Carolina, Columbia, SC, USA
³ School of Exercise and Sport Science, Mayborn College of Health Sciences, University of Mary Hardin-Baylor, Belton, TX, USA

**Category:** Doctoral

**Advisor / Mentor:** Willoughby, Darryn S. (dwilloughby@umhb.edu)

**ABSTRACT**

**PURPOSE:** The purpose of this study was 1) to determine the effect of single bouts of volume- and intensity-equated low (LL) and high load (HL) full-body resistance exercise (RE) on AR-DNA binding, serum/muscle testosterone and dihydrotestosterone, muscle androgen receptor (AR), and AR-DNA binding and 2) to determine the effect of RE on sarcoplasmic and nucleoplasmic β-catenin concentrations in order to determine their impact on mediating AR-DNA binding in the absence/presence of serum/muscle androgen and AR protein. **METHODS:** In a cross-over design, ten resistance-trained males completed volume- and intensity-equated LL and HL full-body RE. Blood and muscle samples were collected at pre-, 3h-, and 24h post-exercise. Separate 2x3 factorial ANOVAs with repeated measures and pairwise comparisons with a Bonferroni adjustment were used to analyze main effects. **RESULTS:** No significant differences were observed in muscle AR, testosterone, dihydrotestosterone, or serum total testosterone in either condition (p > .05). Serum free testosterone was significantly decreased 3h post-exercise and remained significantly less than baseline 24h post-exercise in both conditions (p<.05). In response to HL, AR-DNA binding significantly increased at 3h post-exercise (p<.05), whereas no significant differences were observed at any time in response to LL (p>.05). Moreover, sarcoplasmic β-catenin was significantly greater in HL (p<.05) without significant changes in nucleoplasmic β-catenin (p>.05). **CONCLUSION:** Increases in AR-DNA binding in response to HL indicates AR signaling may be load-dependent. Furthermore, despite the lack of increase in serum and muscle androgens or AR content following HL RE, elevations in AR-DNA binding with elevated sarcoplasmic β-catenin suggests β-catenin may be facilitating this response.