

## **Sex Dimorphism in Muscle Damage-Induced Inflammation**

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### **ABSTRACT**

Evidence suggests that estrogen can provide a protective effect against muscle damage-induced inflammation. However, to date, no study has directly compared the muscle damage-induced intramuscular cytokines gene expression between men and women. **PURPOSE:** The purpose was to determine the intramuscular cytokine response to a bout of unaccustomed eccentric exercise in men and women. **METHODS:** Untrained men (n=8, 22 ± 3y) and women (n=8, 20 ± 1y) completed a session of 80 unilateral maximal eccentric knee extensions. Vastus lateralis samples were collected and analyzed for gene expression of Interleukin (IL)-6, IL-10, IL-15, tumor necrosis factor (TNF)-α, and transforming growth factor (TGF)-β before exercise (BL), and 12 (12h) and 24 hours (24h) after exercise. Data were **RESULTS:** A significant ( $p < 0.05$ ) time x gender effect was found for IL-10 and TNF-α expression. IL-10 was increased at 12h (13.64 ± 4.22-fold) and 24h (29.34 ± 8.42-fold) compared to at BL for men, but there was no change for women. At 24h, IL-10 was greater for men than for women. Additionally, TNF-α was increased at 24h (7.78 ± 2.17-fold) compared to 12h (3.64 ± 1.36-fold) for men; no change was found for women. A significant time effect was found for IL-6 with an increased at 12h (3.23 ± 0.7-fold) and 24h (4.80 ± 1.57-fold) compared to BL. No changes were observed for IL-15 and TGF-β expressions. **CONCLUSION:** In response to exercise-induced muscle damage, TNF-α and IL-10 gene expression increased in men but not in women. These results suggest that there is a sex dimorphic response in muscle damage-induced intramuscular pro-inflammatory and anti-inflammatory cytokines.