

## Effects of Submaximal Downhill Running on Cytokine Expression in Young, Endurance Trained Men and Women

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Strenuous exercise has been shown to dramatically alter levels of anti- and proinflammatory cytokines; proteins involved in the regulation of systemic inflammation. **PURPOSE:** To determine if a single bout of submaximal downhill running will elicit a change in the expression of specific circulating cytokines. **METHODS:** Healthy endurance-trained men (n=5) and women (n=3) aged 18-35 were screened for exercise contraindications using a health history questionnaire, blood chemistry, and body composition. A VO<sub>2max</sub> test and downhill running familiarization were completed to determine experimental running speed at 70% VO<sub>2max</sub>. After abstaining from exercise, caffeine, alcohol, NSAIDs, and other drugs for 48 hours, subjects ran on a 15% decline for 30 minutes at 70% VO<sub>2max</sub> and ~70% HRR. Fasting blood samples were obtained immediately before and after the run, as well as after 30 minutes, 60 minutes, and 24 hours of rest. Plasma was immediately separated, aliquoted, and stored at -80°C. ELISA kits specific to each cytokine were used to measure levels in plasma at each time point. Samples were run in duplicate. **RESULTS:** There were no significant changes in IL-15 or Myostatin at any time point. Compared to baseline, IL-1ra showed an increase of 46.9% (p=0.009), 60.9% (p=0.001), and 38.8% pg/ml (p=0.028) at 0 minutes, 60 minutes and 24 hours after exercise, respectively. For IL-10, there was an increase of 19.6% (p=0.01), 28% (p=0.003), and 37.1% pg/ml (p=0.0009) at 30 minutes, 60 minutes, and 24 hours after exercise, as compared to baseline. **CONCLUSION:** In endurance trained individuals, a 30 minute submaximal bout of downhill running caused an increase in the anti-inflammatory cytokines IL-1ra and IL-10 for up to one day, and no significant change in the inflammatory cytokines IL-15 or myostatin. IL-1ra exhibited the greatest increase 60 minutes after exercise, while IL-10 was increased significantly at 30 minutes, 60 minutes, and 24 hours, with the greatest effect being seen the day after exercise. Further, IL-15 levels were highly variable, and dichotomized subjects into two distinct groups that were not explained by any demographics studied here. This result has not been previously reported and deserves further study.

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