

Insulin-Like Growth Factor-I as a Candidate Metabolic Biomarker: Military Relevance and Future Directions for Measurement

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Abstract

Insulin-like growth factor (IGF)-I is a ubiquitous peptide hormone involved in a host of critical physiological processes (e.g., protein synthesis and glucose homeostasis) and has been suggested to be a biomarker reflecting health and metabolic status. In most cases (muscle, bone, tendon, body composition, and cognitive function), elevated IGF-I concentrations are considered beneficial; however, cancer remains a notable exception. While the fact that both increased and decreased IGF-I can be considered reflective of favorable and beneficial health outcomes may appear as a paradox, it is important to emphasize that, in both cases, measured IGF-I concentrations do offer important insight into physiological processes. The effects of military operational field training on the circulating IGF-I system are discussed within the context of novel measurement technologies that (1) are field expedient and (2) provide more meaningful information. Prospective experimental approaches involving physical activity that sample and measure IGF-I in the body's various biocompartments will provide greater insight into the complex role that IGF-I possesses. Minimally invasive technologies that are field expedient, cost-effective, and allow for continuous and real-time feedback will have the greatest likelihood of being adapted and used in military environments.

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Abbreviations: (ALS) acid labile subunit, (BP) binding protein, (IGF) insulin-like growth factor, (TDF) transdermal body fluid

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