



ABEL-Sport™ test for assessing over training syndrome and detecting infection

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There are many tests available to the sports science team to manage training loads and measure the effects of physical, psychological, environmental and physiological interventions. However, those that aim to predict an infection and/or identify overtraining, generally remain wanting. And to complicate matters further there is often a lack of consensus as to what constitutes overreaching (OR) overtraining (OT) and the overtraining syndrome (OTS). We describe a reproducible test, on a small drop of blood, that can be performed close to the athlete on a portable luminometer (ABEL-meter-1) or in a laboratory. The test does not measure a single biomarker of OTS but instead utilises hidden information acquired by circulating leucocytes as they patrol the body spotting pathogens, responding to markers of inflammation (cytokines and chemokines) and other changes in the blood that occur after strenuous exercise. These cells also know you have an infection before there are any signs or symptoms. The ABEL-sport™ test is designed to elicit this hidden information from the cells. The test incorporates the bioluminescent protein Pholasin® which emits light with reactive oxygen species (ROS). In the test, the NADPH oxidase system of the leucocytes is artificially activated to produce ROS. Light response graphs quantify changes in the rate of production and magnitude of the ROS generated. The interpretation of the graphs is used to identify various responses during training, indicating if the athlete is heading towards OTS and identifying infections, superimposed on training curves. ABEL-sport™ provides objective assessments of an athlete which can support management decisions. The test has been validated for many years with elite and amateur athletes in many different fields and was successfully used by Skandia Team GB for two years prior to and in the final run up to the Olympics in Beijing in 2008 when Britain's squad topped the medal table in the Olympic sailing competition.