Novel Blood Metabolomics Profiling for Concussion Diagnosis

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Technology description

A metabolomics based blood test has been developed that can determine even mild concussions with up to 95% accuracy.
Background
Technology Overview
Metabolomics is a field of study that measures a person’s small metabolite profile (<1500 Daltons), including amino acids, acylcarnitines, glycerophospholipids, sphingolipids and sugars. The allure of metabolomics lies with the concept that metabolites fall downstream of genetic, transcriptomic, proteomic, and environmental variation, thus providing the most integrated and dynamic measure of phenotype and medical condition. Two complimentary methods for metabolomics are nuclear magnetic resonance (NMR) spectroscopy and mass spectrometry (MS). Both 1H NMR and DI-LC-MS/MS metabolic plasma profiles were obtained from individuals diagnosed clinically with concussion and in those without a concussion (“controls” or “normals”). These metabolite results were then analyzed with advanced mathematical techniques. Based on our plasma metabolomics profiling, concussion was predicted with up to 92-95% certainty. Further mathematical analysis has identified several key predictive metabolite profiles leading to the potential development of point of care testing to diagnose concussed patients with unprecedented accuracy. A return to a normal metabolomic profile may serve as an aid in the rehabilitation of individuals affected by concussion, and guide return to pre-injury daily activities.

Application area

Conclusive concussion diagnosis.
Prognostic potential.
Potential rehabilition aid.

Advantages

Accurate up to 92-95%.

Relatively inexpensive.
Point of care potential.

Institution

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