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Detection of novel biomarkers in the cerebrospinal fluid of multiple sclerosis patients

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A biological biomarker may provide a valuable means to detect, measure, or quantify normal biological activity or those associated with a disease, or assess the effects of a disease treatment. Differential proteome profiling is often used to provide a basis for mining suitable biomarkers of disease. However, patho-physiological changes may be manifested as either a difference in protein post-translational modification (PTM) levels and/or alteration in protein associations. These processes may arise in the absence of protein level changes, and may therefore be missed by conventional biomarker proteomics. We have assessed protein PTM in the cerebrospinal fluid of multiple sclerosis (MS) patients and controlsubjects. We report the detection of novel protein biomarkers in MS patients via radiolabelling of PTMs. The sensitivity afforded by protein PTM radiolabelling and autoradiography provided a basis to detect novel protein biomarkers, and characterise the proteins by one dimensional and two dimensional separation techniques. This sensitivity and detection of protein PTM provided a viable means to track these novel biomarkers, and enable purification to a level sufficient for mass spectrometry identification.

Biography

Wayne Grant Carter received his Honours degree in Biochemistry with Nutrition from the University of Southampton. He then completed a Ph.D. at the University of Southampton studying the molecular signalling cascade elicited by insulin supervised by Dr. Graham Sale. Dr. Carter then moved to the Babraham Institute, Cambridge, to work with Professor Jeremy Saklatvala, on studies to elucidate the signalling mechanisms activated as a response to pro-inflammatory cytokines. Dr. Carter then joined the Department of Human Anatomy & Genetics headed by Professor Kay Davies CBE FRS at the University of Oxford, before moving to take up an industrial post with Mobious Genomics, Exeter. In 2003, Dr. Carter joined the Medical Research Council Applied Neuroscience Group at the University of Nottingham headed by Professor David Ray. Dr. Carter has received external grant funding for his academic studies from research funding bodies that include the Wellcome Trust, The Physiological Society, UK Sport, and the National Institutes of Health, USA, and also from commercial sources that include Syngenta. His professional affiliations include the American College of Sports Medicine, the Biochemical Society, the British Neuroscience Association, the British Toxicological Society, the Physiological Society, and the Royal Society of Chemistry.

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