Diabetes-2013

OMICS Group Conferences
Accelerating Scientific Discovery

4th World Congress on
Diabetes & Metabolism

August 14-16, 2013 Holiday Inn Chicago-North Shore, USA

Cytokines and growth factors and their therapeutic potential in obesity and type 2 diabetes

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Abstract

The prevalence of adult obesity has increased approximately 75% in the last quarter century with an alarming increase in obese children in both developed and developing countries. An abundant number of disorders directly correlate with obesity. These include a number of cancers, glucose intolerance, dyslipidemia, cardiovascular disease and insulin resistance which may ultimately culminate in pancreatic beta cell failure and type 2 diabetes. Alarmingly, in the year 2010 there were already 285 million adults with diabetes in the world and current estimates forecast that this will increase to 439 million people by 2030 (1). This highlights why obesity and diabetes is considered a global epidemic. Thus, the development of new strategies to treat 'metabolic disease' is urgently required. A vast amount of research has implicated the cytokine tumour necrosis factor-α (TNF-α) in the metabolic syndrome. In a metabolic setting, TNF-α may act systemically to decrease AMPK activity and fat oxidation in a range of metabolically active tissues. Increased accumulation of ceramides and diacylglycerol may then suppress insulin sensitivity *in vivo* (2). We and others have demonstrated that a number of factors including brain-derived neurotrophic factor and interleukin-6 are produced by contracting skeletal muscle and may exert profound positive effects on fat oxidation and glucose uptake (3,4). These exciting results indicate the potential of cytokines and growth factors as possible therapeutics in obesity and type 2 diabetes. This presentation will also highlight that cytokines and growth factors may be a double edge sword when it comes to the metabolic syndrome.

Biography

Vance Matthews is the head of the "Laboratory for Metabolic Dysfunction" at the Western Australia Institute for Medical Research. Since completing his PhD in 2002, he has completed successful post-doctoral positions in Germany, Western Australia and Melbourne. He has published over 36 manuscripts which have been published in premier journals including *Journal of Biological Chemistry, Blood, Hepatology, Journal of Clinical Investigation, Journal of Experimental Medicine, Diabetes and Diabetologia.* He regularly reviews for many peer review journals and he is a member of the "World Journal of Gastroenterology" editorial board.