"NOVEL THERAPEUTIC TARGET FOR OBESITY AND DIABETES" VCU #11-007

Applications

- Therapeutic target for obesity, type 2 diabetes, and cardiovascular disease
- Model for drug screening
- Biomarker for metabolic syndrome

Inventors

Andrew Larner, MD, Ph.D.

Contact

Wendy M. Reid, Ph.D.
Licensing Associate
wmreid@vcu.edu
Direct 804-827-2213

Market Need

The prevalence of obesity and type 2 diabetes has reached epidemic proportions worldwide, with an estimated 150 million people suffering from diabetes and nearly 300 million people estimated to be obese. Clinical strategies such as bariatric surgery carry high risk and options for pharmaceutical intervention have been very limited with multiple weight loss/obesity therapeutics being withdrawn from the market or failing in pipeline. Two functionally different types of fat contribute to the maintenance of energy balance. White adipose tissue (WAT) is the primary site of energy storage and produces a variety of cytokines and hormones that modulate the action of insulin; In contrast, brown adipose tissue (BAT) is responsible for energy expenditure in the form of thermogenesis. It has more recently been recognized that BAT is present in human adults and may play a role in the pathogenesis of obesity. Therefore increasing BAT production is an attractive target for preventing obesity, but also secondary complications such as diabetes and cardiovascular disease

Technology Summary

Researchers at VCU have discovered a novel signaling pathway and target for obesity. They found that tyrosine kinase 2 (Tyk2) and signal transducer and activator of transcription 3 (Stat3) play essential roles in BAT development and the pathogenesis of obesity via a novel signaling pathway that regulates epigenetic changes in specific genes. In addition, Tyk2 deficient mice display abnormal glucose clearance, hyperinsulinemia, hyperlipidemia and hyperleptinemia, indicative of metabolic disease, and an increased susceptibility for development of non-alcoholic fatty liver disease. Agents which either activate Stat3 or increase the expression of Tyk2 could be used to reverse or alter the development of obesity. Thus, TyK2 represents an excellent target for therapeutic treatments and diagnostics of obesity and type 2 diabetes.

Technology Status

For background see: Science. 2009 February 6; 323(5915): 793–797.

This technology is available for licensing to industry for further development and commercialization.