Mouse Model for Insulin Resistance

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Technology description

Created by Oregon State University professor Chrissa Kioussi, the mouse model is a SKELETAL MUSCLE SPECIFIC PITX2 NULL MOUSE. Development of the mouse model led to the discovery that the sequence specific transcription factor Pitx2 regulates glucose metabolism and has a direct impact on glycemic control of muscle function and all energy control systems. Skeletal muscle is a major organ in glucose homeostasis and when muscle atrophies results in organ specific or systemic diseases associated with hyperglycemic state. This mouse model permits a systematic and comprehensive approach to discover inter-organ feedback interactions during obesity and type 2 diabetes using a genetically driven organ-atrophy approach.

Background of Invention

Type 2 diabetes (T2D) is the most common form of diabetes. According to a 2016 report by the WHO, the number of people suffering from T2D is over 400 million, and the global prevalence of diabetes is higher than 8%. Although healthy eating and exercise allow some people to control their blood glucose levels, many individuals require medications and thus, there is a need to exploit every promising avenue of diabetes research and drug development. The increased prevalence of T2D, and the limitations of the currently available preventative and therapeutic options highlight the significance for a deeper understanding of T2D pathogenesis. Genome association studies have confirmed the polygenic nature of the disease, while in the late stage of the disease, however, the progressive changes of gene-based events are still uncharted. To meet these challenges, we have developed a mouse model (Pitx2MCK) that exhibits atrophying skeletal muscle and develops excessive fat and T2D. Pitx2 mutations associated with the RIEG1 (OMIM 180500) and SHORT syndromes (OMIM 269880) in humans characterized by organ malfunctions, muscle weakness and insulin-resistance.

Application area

Pharmaceutical R&D

Obesity and Diabetes Research

Advantages

Mouse model for type 2 diabetes

Muscle specific Pitx2 null mouse

Institution

Oregon State University

Inventors

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