Title: **PM21D1 and N-Lipidated Amino Acids for the Treatment of Metabolic Disorders**

Inventor(s): Bruce Spiegelman

Patent Information: PCT Filed

Business Opportunities: Available for Licensing and Research Collaboration Opportunities

Markets: Obesity, Diabetes

Key Words: Metabolism

Description: The Spiegelman lab has discovered a secreted enzyme, peptidase M20 domain containing 1 (PM20D1), that plays a key role in augmenting energy dissipation in thermogenic adipocytes. PM20D1 is a bidirectional biosynthetic enzyme for a class of N-lipidated amino acids, the metabolites of which are endogenous uncouplers that regulate mitochondrial respiration. PM20D1 is highly enriched in thermogenic versus non-thermogenic adipocytes and promotes energy expenditure in vivo. Mice with increased circulating PM20D1 show augmented energy expenditure, blunted weight gain on high fat diet, and improved glucose homeostasis. Furthermore, direct treatment of adipocytes with N-lipidated amino acids, such as oleoyl-phenylalanine, increases oxygen consumption. These findings provide strong support for the utilization of this novel enzymatic pathway, made up of PM20D1 and its N-lipidated amino acid metabolites, for the development of new treatments for metabolic disorders.

Applications: Administration of either recombinant PM20D1 or its N-lipidated amino acid products as potential novel therapeutic strategies for augmenting energy expenditure in humans to treat obesity and diabetes.

Competitive advantage:

1. Novel anti-diabetic and anti-obesity approach by augmenting PM20D1 levels
2. Pharmacologic use of oleoyl-phenylalanine or related N-lipidated amino acids to promote adipose oxygen consumption represents as new approaches for augmenting energy expenditure

Stage of Development: Contact information below for most updated stage of development.

Publications: Long et al., 2016, Cell 166, 424–435. The secreted enzyme PM20D1 regulates lapidated amino acid uncouplers of mitochondria.

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Reference: C2090