CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP140473

Project Title:
Investigation of the Tumor Suppressor TMEM127 on Lysosome Function and Lipid Metabolism

Award Mechanism:
Individual Investigator

Principal Investigator:
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Entity:
The University of Texas Health Science Center at San Antonio

Lay Summary:

Obesity is associated with increased cancer risk and understanding the processes involved in control of body weight can have an impact in reducing this risk. The lysosome, a cell organelle better known for its clearance of degraded proteins and other cell particles and often referred to as the cell sink, has recently been recognized as a critically important signaling center that synchronizes the response to nutrients, including fat, with cellular function and growth. We previously identified the novel tumor suppressor gene TMEM127 to be mutated in hereditary cancers and found that this gene is located in the lysosome. We have now developed a mouse model of TMEM127 inactivation and determined that mice without TMEM127 are lean, have low glucose levels despite normal food intake, and display increased lysosomal mass. Our proposal seeks to further explore the link between TMEM127, lysosomal function and fat metabolism. Furthermore, understanding the mechanisms underlying the low fat mass of the TMEM127 null mice may have implications for our understanding of the biology of obesity, as well as obesity-induced diabetes, in the context of a genetic cancer model. These disorders are particularly prevalent in the Texas population, so results from these studies have the potential to benefit local cancer patients that suffer from metabolic diseases. This work emphasizes how the elucidation of novel basic cellular processes may potentially lead to the development of new approaches for treatment of human disease.