RAB1A PROTEINS, POLYPEPTIDES AND COMPOSITIONS, INCLUDING LIPID NANOPARTICLE FORMULATIONS, FOR USE IN OBESITY TREATMENT

FIELD OF INVENTION

The present invention relates generally to treatment of obesity. More specifically, the present invention relates to compositions and methods for enhancing microautophagy to treat obesity and related diseases or disorders.

BACKGROUND

There are three known cellular processes, in eukaryotes, through which the cytosolic content and/or subcellular organelles can be delivered to or acquired by lysosomes for degradation: namely macroautophagy (commonly known as autophagy), microautophagy, and chaperone-mediated autophagy. Microautophagy, unlike macroautophagy or chaperone-mediated autophagy, is a type of autophagic process that is mediated by direct lysosomal (in mammals) or vacuolar (in plants and fungi) piecemeal engulfment of a cytoplasmic target or cargo (e.g. protein, lipid, glycogen or pathogen).

Microautophagy may contribute to cytosolic protein degradation via multivesicular bodies (MVBs) of the late endosomes. In addition, microautophagy may also support direct glycogen delivery to lysosomes and its degradation. In this regard, it is contemplated that malfunctioning or insufficient microautophagy may be associated with development of a variety of metabolic and/or neurological diseases, for example.

Clearly, accumulation of particular proteins, lipids, and/or glycogens may be associated with a variety of important diseases, disorders, and conditions. Methods for targeting such proteins, lipids, and/or glycogens are desirable.

Obesity is a leading preventable cause of death worldwide, with increasing rates in adults and children. Indeed, the prevalence of obesity has increased markedly over the past decades and has reached epidemic proportions; over one- third of adults are overweight (BMI 25–29.9 kg/m2) or