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Title: C19ORF12 ORTHOLOG NAZO - AN NBIA ASSOCIATED GENE IS REQUIRED FOR LIPID HOMEOSTASIS IN DROSOPHILA GUT.

Abstract: Lipid dyshomeostasis has been implicated in a variety of diseases ranging from obesity to neurodegenerative disorders such as NBIA. Here, we uncover the physiological role of Nazo, the *Drosophila* homolog of the NBIA-mutated protein - c19orf12, whose function has been elusive. Ablation of *Drosophila* c19orf12 homologs leads to dysregulation of multiple lipid metabolism genes. nazo mutants exhibit markedly reduced gut lipid droplet and whole-body triglyceride contents. Consequently, they are sensitive to starvation and oxidative stress. Nazo localizes to ER-lipid droplet contact sites and is required for maintaining normal levels of Perilipin2, an inhibitor of the lipase - Brummer. Concurrent knockdown of Brummer or overexpression of Perilipin2 rescues the nazo phenotype, suggesting that this defect may arise from diminished Perilipin2 on lipid droplets leading to aberrant Brummer-mediated lipolysis. Our findings provide novel insights into the role of c19orf12 as a possible link between lipid dyshomeostasis and neurodegeneration, particularly in the context of NBIA.