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In vivo effects of glycolipid transfer protein (GLTP) knockout in HeLa cells

The glycolipid transfer protein (GLTP) has recently been linked to multiple cellular processes and functions aside from its best-known function as a lipid transport protein. For instance, GLTP has been proposed to act as a sensor and regulator of glycosphingolipid homeostasis in the cell. GLTP may also be involved in facilitating or regulating vesicular transport, through its previously determined interaction with the endoplasmic reticulum membrane protein VAP-A (vesicle-associated membrane protein associated protein A). In this study, we have characterized the phenotype of HeLa cells in which GLTP has been knocked out via CRISPR/Cas9, in comparison to wild-type HeLa cells. We show that GLTP knockout affects multiple cellular functions and processes, such as motility, three-dimensional growth and cohesion, lipidome composition and even cellular metabolism. Notably, we also find evidence which suggests that GLTP, through its interaction with VAP-A, indeed does affect vesicular trafficking in the cell. Taken together, we show direct effects of GLTP on multiple cellular processes, most significant of which are its evident effects on cellular metabolism and vesicular trafficking.

Session

Molecular interactions at the membrane surface

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