The yin and yang of cell signaling

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Lysophospholipids (LysoPLs) are potent cellular signaling biomolecules that also maintain the structure, shape and fluidity of cell membranes.

Imbalance in LysoPL levels has been associated with cell proliferation, inflammatory processes and neurological diseases.

In mammals, cellular levels of LysoPLs are finely regulated primarily by the enzymes lysophospholipase (LYPLA) 1 and 2. Although the enzymes are similar in their protein sequence and structures, they display moderate substrate specificity.

To better understand their role in LysoPL metabolism, Lawrence Marnett, PhD, and colleagues used CRISPR-Cas9 technology to generate stable knock-outs of LYPLA1 and/or LYPLA2 in mouse neuroblastoma cell lines.

Their work, published this month in the *Journal of Lipid Research*, showed that LYPLA1 and LYPLA2 compensated for the loss of each other and cooperatively maintained LysoPL levels in the cells.

However, deletion of both enzymes led to dramatically increased LysoPL levels and increased activation of the mitogen-activated protein kinase (MAPK) signaling pathway, which has been implicated in development of human neurodegenerative diseases and cancer.

More information: James A. Wepy et al. Lysophospholipases cooperate to mediate lipid homeostasis and lysophospholipid signaling,

Journal of Lipid Research (2018). DOI: 10.1194/jlr.M087890