

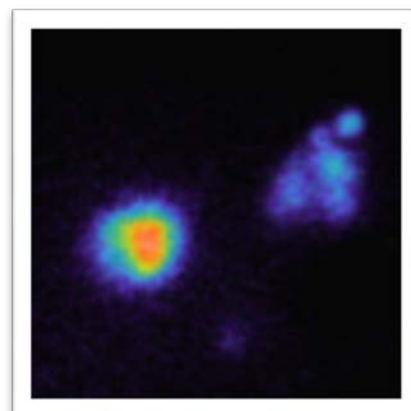
INSULIN RELEASE BY LEUCINE: A NEW PARTNER REVEALED

The nutrients present in the diet are essential for the survival, growth and physical fitness of individuals. Their ingestion induces the production of several hormones that regulate the body's energy balance, such as insulin. For several decades, insulin secretion by pancreatic β cells has been considered as mainly related to blood sugar levels, but other nutrients can also stimulate insulin release. However, the mechanism of action of the latter still remains mysterious...

Yaël Grosjean's team explores these mechanisms of action using a small fly, *Drosophila*, and the wide variety of genetic tools that are available for this organism. This team is particularly interested in the properties of dietary leucine, an amino acid capable of stimulating *in vitro* insulin release by pancreatic β -cells in humans and several other mammals. In 2016, this team had highlighted the fundamental role played by an amino acid transporter called Minidiscs (LAT-1 in humans) in *Drosophila*¹.

In an article just published in *Scientific Reports*, these researchers demonstrate that a second amino acid transporter, Jhl-21, is also involved. Using a calcium imaging technique that visualizes calcium flow in specific *Drosophila* brain cells (see photo opposite), they showed that knockdown of Jhl-21 in insulin-producing cells causes malfunction of these cells: they are no longer able to sense dietary leucine or to release insulin. Knockdown of Jhl-21 further causes metabolic defects including defective sugar uptake and altered growth.

These new data represent a major advance in the understanding of molecular events controlling insulin release following bolus ingestion. In particular, they enable to pinpoint the role of amino acid transporters and their impact on insulin-dependent metabolism.



Contact

Dr. Yaël Grosjean : yael.grosjean@u-bourgogne.fr

To know more

Ziegler AB, Manière G, Grosjean Y (2018) Jhl-21 plays a role in *Drosophila* insulin-like peptide release from larval IPCs via leucine transport. *Scientific Reports*, 8, 1908.

Mots-clefs

Insulin; leucine; amino acid; *Drosophila*; genetic; metabolism

¹ https://www2.dijon.inra.fr/csga/doc/actualite/oct_2016_secretion_insuline.pdf