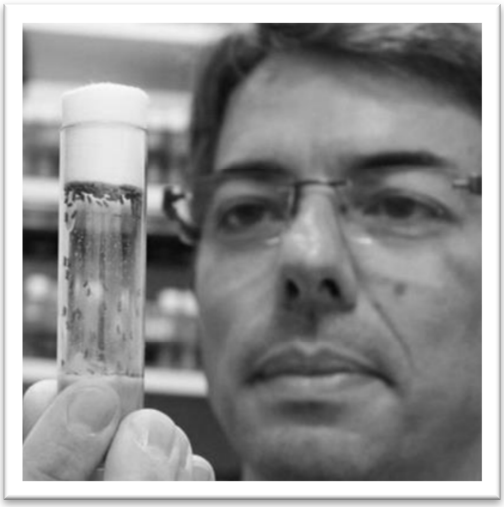
A NEWLY-DISCOVERED INSULIN SECRETION PATHWAY



How does an organism adjust its food intake? The "Sensory perception, interaction between glia and neurons" group of the CSGA directed by Dr. Yaël Grosjean is working to answer that question thanks to a small fly, Drosophila, or the common fruit fly. In fact, access to the genome of this small fly is simple and accurate, making it one of the most powerful biological models.

Thanks to this genetic model, Gérard Manière and his colleagues have demonstrated the existence of a new molecular pathway that controls the liberation of insulin, a key hormone in the regulation of glycemia. Using extremely precise genetic techniques to modify gene expression and visualize cell activity, researchers have discovered that the liberation of insulin by Drosophila larvae secretory cells in the brain does not require an intermediary hormonal signal in contrast to what is currently thought, but is possible due to an amino acid: leucin.

Their model proposes that the Drosophila fat body and/or the gut are sensing the availability of leucine (an amino acid that is well-known to bodybuilders) in order to release insulin. This effect depends on a specific amino acid transporter called Minidiscs (LAT-1 in man). This leucine/Minidiscs signaling pathway represents a conserved mechanism for insulin secretion from an evolutionary point of view. This discovery opens promising research pathways to understand food intake and its dysfunction.

This research, which represents a significant advance in the domain of understanding insulin secretion, is presented in an article that has just been accepted for publication in Cell Reports.

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To know more

Manière G, Ziegler AB, Geillon F, Featherstone DE & Grosjean Y (2016). Direct sensing of nutrients via a LAT1-like transporter in Drosophila insulin-producing cells. Cell Reports, 17, 137-148.

Key-words

Insulin, glycemia, leucine, amino acid, *Drosophila*, genetic