

BDR SEMINAR in Kobe

"CDB SEMINAR" and "QBiC SEMINAR" have been renamed "BDR SEMINAR".

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Tuesday, March 5, 2019

16:00-17:00, Seminar Room, Building A 7F

Feeding state modulates body temperatures and the controlling pathway in *Drosophila*

Summary

Animals adjust their behavior or physiological responses according to their internal state. Feeding state is important for setting their physiological conditions. A prolonged starvation is life-threatening, and therefore starvation causes lower metabolism and body temperature for survival. However, how internal nutrient information is decoded in target neurons in the brain, which in turn modulates their body temperature is largely unknown. We previously showed that fruit flies, *Drosophila melanogaster*, exhibit a robust temperature preference behavior and we show here that starvation causes a lower preferred temperature (T_p). Because flies are small ectotherms, the lower T_p could result in lower metabolism and body temperature. Furthermore, longer starved flies show more colder T_p and the phenotype is restored when the flies refeed a normal food after starvation. We determine that Insulin-like peptide 6 (Ilp6) in the fat body (equivalent to liver and adipose tissues in mammals) and insulin signaling in the transient receptor potential A1 (TrpA1)-expressing cells (Anterior cells; ACs) are responsible for reduction in T_p . Importantly, starvation decreases the responding temperature of ACs depending on insulin signaling, which results in lower T_p . Together, our results suggest that internal nutrient information from fat tissues to brain via insulin signaling regulates the starvation-dependent thermoregulation.



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