

ALL IN PROPORTION

Drosophila insulin-like peptides (dILPs) regulate part of the signaling pathway that helps keep organs growing in proportion during development. When the larval fly eats food **1** the fat body detects the spike in dietary nutrients, and in response, fat cells upregulate the TOR signaling pathway **2**. The fat body, a single organ that runs the length of the larva, releases a signal that travels to the brain. The nature of the fat-to-brain messenger remains elusive, although recent work implicates a cytokine called UPD2, which has functional similarity to the human hormone leptin. Plentiful nutrients also trigger PI3 kinase signaling in muscle cells **3**, likewise sending an unknown signal to the brain that triggers increased feeding behaviors. In response to this information, the brain releases dILP2, dILP3, and dILP5 into the hemolymph **4** to help regulate larval growth. The brain also releases dILP6, which acts locally on brain cells **5** to increase the replication of neural stem cells.

