Flower power controls the flow of synaptic transmission

The calcium channel Flower (Fwe) helps regulate normal vs. bulk endocytosis during different stimulation paradigms.

When an action potential reaches the end of the line at a nerve terminal, a complex series of molecular events culminates in the release of neurotransmitters: a process referred to as 'synaptic transmission.' The regulation of synaptic transmission is critical to understanding information processing in the nervous, and, importantly, how that processing can go awry.

In new work published in *PLoS Biology*, Chi-Kuang Yao *et al.* take a deeper look at Flower (Fwe), a synaptic vesicle associated calcium channel they previously identified in a genetic screen of *Drosophila* (*PLoS Biol.* 15, e2000931; 2017). Previously shown to be associated with clathrin-mediated endocytosis (CME), a form of retrieving synaptic vesicles for future release of neurotransmitter, Flower is now demonstrated to also

A model for different roles of Fwe in CME and ADBE. Adapted from *PLoS Biol.* 15, e2000931 (2017).

participate in activity-dependent bulk endocytosis (ADBE). CME and ADBE are the two predominant forms of vesicle endocytosis, but occur under very different stimulation conditions: CME during moderate nerve stimulation, and ADBE under intense stimulation. Importantly, this new work shows that Flower proteins behave quite differently under the

two stimulation paradigms, promoting CME independently of calcium channeling during moderate stimulus conditions, but driving calcium influxes leading to ADBE during in the presence of intense stimulation. Flower, therefore, may play a key role in linking stimulus-dependent forms of synaptic vesicle endocytosis.

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