Larvae shun the light

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Drosophila larvae avoid light during the foraging stage of their development. Research published in the open access journal *BMC Neuroscience* shows that both 5-HT (serotonergic) and corazonergic neurons have a role in regulating this behavior.

To identify which neurons modulate the larvae's photobehavior, Verónica G. Rodriguez Moncalvo and Ana Regina Campos from McMaster University, Ontario, Canada analysed *Drosophila* larvae which had been genetically engineered to achieve suppressed synaptic transmission in candidate neurons. Muted synaptic transmission can be achieved by targeted expression of tetanus toxin light chain (TNT), as when made in neurons TNT suppresses evoked and spontaneous neurotransmitter release. The authors looked first at larvae in which dopaminergic, serotonergic and corazonergic neurons had been silenced by using the DOPA decarboxylase (Ddc) promoter to drive TNT expression, and subsequently at larvae expressing constructs with more specific promoters, in which different subsets of Ddc neurons were muted. Larvae with and without the function of these neurons were put through their paces in light and dark conditions.

The results show that inactivation of Ddc neurons increases the aversion to light, both during the foraging phase, when larvae are characteristically photophobic, and the later stages of development, when larvae are usually photoneutral. Both 5-HT neurons and corazonergic neurons, but not dopaminergic neurons, contribute to light-controlled larval locomotion, and this is modulated at least partly by 5-HT neurons located in the brain hemispheres. However, this

modulation does not appear to occur at the photoreceptor level and may be mediated by 5-HT1ADro receptors. These findings may provide clues to help identify the target neurons of the serotonin signalling, which the authors believe could be critical for light-controlled movement.

"These findings provide new insights into the function of 5-HT neurons in *Drosophila* larval behavior, as well as into the mechanisms underlying regulation of larval response to light," says Campos.

More information: Role of serotonergic neurons in the Drosophila larval response to light, Veronica G Rodriguez Moncalvo and Ana REGINA Campos, *BMC Neuroscience* (in press), www.biomedcentral.com/bmcneurosci/

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