***lgc-40* Encodes a Choline-Gated Chloride Channel Subunit Expressed in Neurons and Muscles**

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How neurons interact with the environment and each other to process information in the nervous system is a basic question in neurobiology. To understand these fundamental interactions, it is important to identify neurochemical signals and receptors and characterize their effects on neuronal physiology and animal behavior.

Guided by a BLAST search of the *C. elegans* genome using the protein sequence of the serotonin-gated chloride channel *mod-1*, Ringstad et al. (*Science* 325, 96, 2009) identified LGC-40 as a putative cys-loop chloride channel subunit. Using electrophysiological recordings in *Xenopus* oocytes, they further showed that LGC-40 is gated at low affinity by serotonin (EC_{50}=905 µM) and acetylcholine (EC_{50}=87 µM) and at high affinity by choline (EC_{50}=3.4 µM), raising the intriguing possibility that LGC-40 acts *in vivo* as a high-affinity ionotropic choline receptor.

I am using expression studies and behavioral analyses to understand the role of *lgc-40* in *C. elegans* physiology. Transcriptional fusions to GFP indicate that *lgc-40* is expressed in a subset of neurons in the head, tail, and body of the worm, including the PHA chemosensory neurons and likely the NSM neurons. Additionally, the anal depressor and vulval muscles as well as the distal tip cell of the gonad express *plgc-40::GFP*. Using the *lgc-40* expression pattern as a guide, I am now performing behavioral assays of *lgc-40* deletion mutants to identify behavioral defects.

Poster
Primary Topic: Neurobiology
Secondary Topic: Synaptic Function and Circuits
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