Title:	The C-terminal of CASY-1/Calsyntenin regulates GABAergic synaptic transmission at the Caenorhabditis elegans neuromuscular junction
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Abstract:	The C. elegans ortholog of mammalian calsyntenins, CASY-1, is an evolutionarily conserved type-I transmembrane protein that is highly enriched in the nervous system. Mammalian calsyntenins are strongly expressed at inhibitory synapses, but their role in synapse development and function is still elusive. Here, we report a crucial role for CASY-1 in regulating GABAergic synaptic transmission at the C. elegans neuromuscular junction (NMJ). The shorter isoforms of CASY-1; CASY-1B and CASY-1C, express and function in GABA motor neurons where they regulate GABA neurotransmission. Using pharmacological, behavioral, electrophysiological, optogenetic and imaging approaches we establish that GABA release is compromised at the NMJ in casy-1 mutants. Further, we demonstrate that CASY-1 is required to modulate the transport of GABAergic synaptic vesicle (SV) precursors through a possible interaction with the SV motor protein, UNC-104/KIF1A. This study proposes a possible evolutionarily conserved model for the regulation of GABA synaptic functioning by calsyntenins.
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