Novel isoforms of dlg are fundamental for neuronal development in Drosophila

Mendoza, Carolina

Olguín, Patricio

Lafferte, Gabriela

Thomas, Ulrich

Ebitsch, Susanne

Gundelfinger, Eckart D.

Kukuljan, Manuel

Sierralta, Jimena

Drosophila discs-large (dlg) mutants exhibit multiple developmental abnormalities, including severe defects in neuronal differentiation and synaptic structure and function. These defects have been ascribed to the loss of a single gene product, Dlg-A, a scaffold protein thought to be expressed in many cell types. Here, we describe that additional isoforms arise as a consequence of different transcription start points and alternative splicing of dlg. At least five different dlg gene products are predicted. We identified a subset of dlg-derived cDNAs that include novel exons encoding a peptide homologous to the N terminus of the mammalian protein SAP97/hDLG (S97N). Dlg isoforms containing the S97N domain are expressed at larval neuromuscular junctions and within the CNS of both embryos and larvae but are not detectable in epithelial tissues. Strong hypomorphic dig alleles exhibit decreased expression of S97N, which may account for neural-specific aspects of the pleiomorphic dlg mutant phe