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Proteolytic maturation of *Drosophila* neuroligin3 in central nervous system

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Neuroligins are postsynaptic adhesion molecules that are essential for synaptic function and regulation by binding to their presynaptic ligands, Neurexins. Mutations in neuroligin and neurexin genes have been implicated in cognitive diseases such as autism. Previous study shows more than two isoforms of endogenous neuroligin3 in *Drosophila*. Here, we report that *Drosophila* neuroligin3 (DNlg3) is proteolytically activated in the central nervous system specifically, which is essential for an interesting behavior. A protease belonging to ADAMs (a disintegrin and metalloproteinases) family is responsible for DNlg3 processing *in vivo* and *in vitro*. Interestingly, as a membrane protein, DNlg3 is processed intracellularly rather than at the cell surface. DNlg3 is cleaved at its extracellular AchE-like domain to generate the N-terminal fragment (NTF) and the cleaved membrane-anchored fragment (cDNlg3). After cleavage, the cDNlg3 rather than full-length (FL) or NTF can rescue defect in DNlg3 mutants, suggesting that proteolytic cleavage of DNlg3 is required for keeping normal behavior. Our study broadens our knowledge of the scope of Neuroligins function, as well as provides a novel cleavage paradigm for studying other membrane proteins.

Biography

Jun Wu is currently pursuing PhD in Life Science at Southeast University, China. His research interest focuses on the molecular mechanism of neurological disorder diseases, such as autism spectrum disorders.

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