## A regulatory mechanism of synaptic transmission by a chaperone-like factor

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## 1997 Fiscal Year Final Research Report Summary

## A regulatory mechanism of synaptic transmission by a chaperone-like factor

Research Project

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Kanazawa University
Principal Investigator
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Research Abstract

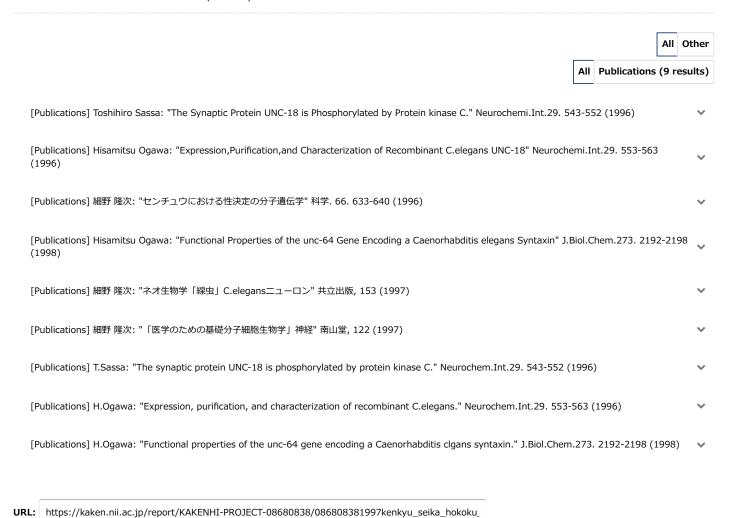
The unc-18 gene contributes to the synaptic transmission. n-Sec-1, the mammalian UNC-18 homolog is believed to be associated with a synaptic plasma membrane protein prior to synaptic vesicle docling. If this were the case for the C.elegans UNC-18, the gene mutations would result in constitutive fusions of synaptic vesicles. However, the gene mutations result in the accumulation of synaptic vesicles and neurotransmitters. To

examine the conflicting observations, we analyzed the binding of wild-type and mutant UNC-18 to syntaxin.

UNC-18 is a hydrophilic, globular, and neutral protein with pI 6.95. In the Sf21 cells the protein is predominantly localized in the cytoplasm, indicating its intrinsic solubility. To investigate further the inracellular distribution of UNC-18, we isolated synaptic vesicles by the percoll gradient fractionation. UNC-18 was detected on synaptic vesicles by Western blotting. We cloned C.elegans cDNAs encoding the mammalian syntaxinA homolog (Ce syntaxin). We tested the binding of UNC-18 to GST-Ce syntaxin fusion protein. UNC-18 binds to the recombinant syntaxin in vitro with high affinity. These findings indicate that the protein is periplasmic associating with both synaptic and plasma membrane, although intrinsically soluble. In vesicle traffic UNC-18 may be regulator with plasma membrane through syntaxin. UNC-18 may cause a conformational change of syntaxin. Therefore the protein allows it to bind to synaptic vesicles.

To test hypotesis, we sequenced cDNAs of 15 unc-18 mutants. We found two missense mutations and the binding ability of mutant UNC-18 proteins to Ce syntaxin is being teted.

## Research Products (9 results)



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