REGIONAL CENTRE FOR BIOTECHNOLOGY

Seminar series

The role of a self-sustaining amyloidogenic protein in persistence of memory

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Kansas City, Missouri

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Seminar Room

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Abstract

A key question in the molecular study of memory is how proteins with a half-life of hours to days are responsible for the maintenance of memory over periods from months to years. The cellular correlate of long term memory is thought to be long term synaptic facilitation. Previously in Aplysia a protein synthesis regulator, Cytoplasmic Polyadenylation Element Binding protein (CPEB), was shown to be necessary for the persistence but not for the initiation of long term synaptic facilitation. Intriguingly, studies in Yeast and in Aplysia neurons revealed that Aplysia CPEB can exist in a self-sustaining amyloidogenic prion-like state. Based on this it was hypothesized that the activity-dependent conversion of CPEB to a self-sustaining state provides a mechanism for persistent synthesis of new proteins, which in turn leads to persistence of memory. A key prediction of this hypothesis is that neuronal stimulation will induce conversion of CPEB to its amyloidogenic prion-like oligomeric form, and conversion to this self-sustaining prion-like state is necessary for the persistence of memory. In my talk I will discuss my work on addressing this hypothesis using Drosophila as a model system.