Locomotor Analysis of Drosophila Mutants Affecting Neurotransmitter Release

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Neurotransmitter-release is regulated by several pre synaptic proteins where Syntaxin and Complexin are crucial. The locomotor activity of Drosophila Melanogaster adult animals was evaluated to see if altered motor behavior could be a consequence of an abnormal central nervous system or altered peripheral nervous system output. To discriminate between central and peripheral motor alterations, the locomotor behaviors in animals with and without head were also studied. The hypothesis was that mutants will show a poorer performance in the assays as result of their altered synaptic transmission. Climbing assays, grooming and flip over were tested in entire animals. Stepping and flip over were tested in decapitated individuals. Complexin null and Syntaxin hypomorph mutants display similar phenotype in synaptic transmission but different behaviors. Complexin mutants could not climb, Syntaxin 3-69 had the lowest climbing speed and the other genotypes had indistinguishable performance. Complexin null flip over in 15min while other genotypes flip over in few seconds. Decapitated animals stay on their feet readjusting the position, but didn't climb. Surprisingly, decapitated animals were able to fly without control and flipped over. It can be concluded, that the abnormal behavior of Syx 3-69 relates with the consolidation of memory as a result of the constantly enhanced velocity to reach the test tube top. Therefore, the hypothesis was accepted. As a future projection it will be interesting to study the possible relation of these models behavior with that of people who suffer from Schizophrenia affection where there is an over expression of Complexin.

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