

Dissecting the molecular mechanisms of neurodegeneration and protective roles of miRNAs in Drosophila SWS/NTE neuropathy model

Initiative: Trilaterale Partnerschaften – Kooperationsvorhaben zwischen Wissenschaftler(inne)n aus der Ukraine, Russland und Deutschland

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Based on previous research and preliminary data, the project consortium hypothesizes that the processes underlying development of SWS/NTE-associated neuropathology and Alzheimer's disease are highly evolutionarily conserved and that miRNAs are involved in the regulation of these processes; therefore, miRNAs can be used to modulate the speed of age-dependent neurodegeneration and be considered as potential drug targets. This central hypothesis will be tested by pursuing specific aims, which have been divided based on the scientific topics and proficiencies for each of the collaborating laboratories. Together the molecular functions of SWS and Appl and their specific roles in different cell types of the nervous system will be investigated, in particular the cells of the blood-brain barrier; a genetic interaction between SWS and Appl will be validated; and it will be analyzed how their stress- and age-dependent expression is fine-tuned by circadian miRNAs. Thus, in this proposal, the consortium expects to clarify the molecular mechanisms promoting age-dependent hereditary and toxicity-induced neurodegeneration, as well as the roles for miRNAs in the process. The significance of the proposed project is broad. Herein, a novel approach to investigate the molecular mechanisms promoting hereditary and toxicity-induced neurodegeneration is planned. Identification of the key factors (e.g. novel interactors or certain miRNAs) that control SWS and APP function upon aging and stress will provide valuable new insights into the mechanisms mediating neuropathy and will facilitate the discovery of novel drug targets to combat age-related neurodegeneration. Thus, this project will provide new directions for therapeutic intervention and will specifically suggest the use of neuroprotective miRNAs as new attractive approaches to modulate the activity of critical proteins during aging or under stress conditions.

Projektbeteiligte

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