Project 1.4. Identification of genes and evolutionary changes in the genome that underlie the biology of astrocytes

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WWW: https://pekowskalab.github.io

Background:

Recent studies indicate that astrocytes, in addition to strictly homeostatic functions, play critical roles in the regulation of synaptic plasticity and the processes of learning and decision making. Numerous neurodegenerative diseases feature astrocyte dysfunctions. Despite their fundamental role in brain biology, the regulatory network that underlies astrocyte functions in humans remains unclear. Astrocytes have changed in the evolution of mammals: morphology, interaction with neurons, and the dynamics of signal transduction pathways are significantly different in human and mouse astrocytes. However, it is unknown which evolutionary changes in the genome underlie the modification of astrocyte biology. Likewise, the implication of the evolutionary changes in astrocyte biology in enhancing the propensity to develop neurodegenerative diseases in humans remains elusive.

Aim:

Identification of genes that are critical for astrocyte biology and the human-specific features of astrocytes

The successful Ph.D. candidate will use the multiple 'omics' data generated in the lab to determine the chromatin activity patterns of astrocytes in chosen mammalian species. She/he will identify genes that are most likely to be crucial for astrocyte biology and evolution.

Requirements:

- master 's degree in bioinformatics
- outstanding commitment to science (documented by training and/or internships in research institutes)
- ability to work independently
- systematic working style
- excellent lab-work reporting skills
- good spoken and written English
- skills in basic bioinformatic tools are required.