**Project 1.12. Identification of genes and evolutionary changes in the genome that underlie the human-specific features 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 in the processes of learning and decision making. 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. At present, however, it is not known which evolutionary changes in the genome underlie the modification of astrocyte biology.

**Aim:**

Identification of genes that are critical for human-specific features of astrocytes

The successful Ph.D. candidate, in cooperation with other team members, will differentiate induced pluripotent stem cells from different mammalian species to astrocytes. Next, using RNA-seq technology, the student will determine the gene activity profile in these cells. Using bioinformatics tools and in collaboration with bioinformaticians, this person will then identify genes that are most likely to be crucial for astrocyte evolution. The candidate will inactivate these loci, using genome editing tools based on the CRISPR-Cas9 system, and determine the impact of these genome modifications on astrocyte biology in vitro.

**Requirements:**

- master 's degree in molecular biology, biotechnology, biochemistry or biophysics,
- outstanding commitment to science (documented by trainings 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.