Glial cells: center stage to brain diseases

Glial cells outnumber by far neurons in the CNS. Because of that, it comes as no surprise that they are central to brain function and disease. In my presentation, I will summarize recent data from our laboratory illustrating how direct signalling at astrocytes, oligodendrocytes and microglia can contribute to tissue damage in neurodegenerative diseases.

In the first part, I will show that astrocytes may be directly damaged by beta-amyloid oligomers, a major pathogenic agent in Alzheimer’s disease. Thus, oligomers interact with astrocyte membrane proteins and alter calcium homeostasis which ultimately results in astrogliosis and astrocyte death. In the second part, I will describe how altered ATP signalling at P2X receptors expressed in oligodendrocytes and myelin, as well as in microglia, may contribute to neuroinflammation, tissue damage and demyelination in multiple sclerosis. Indeed, P2X4 receptors are key to the survival and fate of microglia, and may be relevant to microglia polarization into M1 and M2 phenotypes as well as to the outcome of neuroinflammation. Together, these findings argue in favor of a direct targeting of glial cells with specific drugs as a new avenue for therapeutic intervention.

Recent publications: