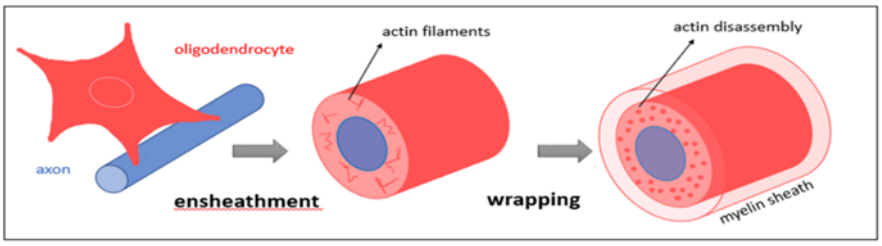
Experimental thesis project in neurobiology. Two positions available



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We are seeking highly motivated students (two positions are available) to undertake a laboratory experimental study for Master Thesis discussion (LM in Molecular, Cellular and Biomedical Science, LM in Biotechnology) starting from September-October 2018.

Project Title: To study the molecular mechanism of action of drugs promoting remyelination using 2D and 3D cell culture.

Background: Myelination starts during embryogenesis and terminate during adolescence in humans. Adult myelination is associated with adaptive learning. Several types of pathologies can lead to central nervous system (CNS) demyelination among which Multiple sclerosis, viral infection, injury and genetic diseases. Demyelination of axon is the main cause of neurodegeneration in patients after axonal demyelination Remyelination is the natural process that restores myelin of damaged axons. CNS remyelination is often incomplete in Multiple Sclerosis (MS) patients, and it declines during aging. Understanding of how remyelination occurs in adult CNS in normal and pathological conditions will open knew views on how adult myelination occurs, as we know little on how neuronal stem cells are reactivated, migrate and differentiate into linage specific oligodendrocyte precursor cells (OPC) and how they mature in myelinating oligodendrocyte (OLs) at lesion in adult brain. These knowledge has enormous medical implications as remyelination therapies might contribute to restore lost function and impair neuronal degeneration in demyelination disease (1). Pharmacological intervention in CNS remyelination became feasible only in the recently years, thanks to the development of suitable phenotypical drug screens (2-3).

WHAT WE DO: Our group has successfully repurposed three classes of compounds out of the 1,200 clinically active drug tested for their ability to promote myelin gene expression using phenotypical screening (2). One drug we selected, Clobetasol, was proven in EAE (3) and Neuromyelitis optica (4) animal models for remyelination. The next challenge will be to clarify their mechanism of action and understand the main cellular pathways leading to engagement of axons in adults.

Refeferences

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