Title: Exploring the functional role of protein glycosylation in neuronal cells

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Work plan

The brain is highly specialized and it has marking distinguishing morphological and functional features. In mouse, the brain contains the highest number of N-glycosylation sites, 36% of which have not been identified in other tissues, and many are contained in brain-specific proteins. Several characteristics of brain protein glycosylation have been shown to be functionally relevant, e.g., the fucosylated Lewis X (Le X; Galβ4[Fucα3]GlcNAc) is involved in neurite outgrowth. However, the underlying mechanism is still unknown. In the central nervous system Le X is synthesized by the enzyme fucosyltransferase IX.

In this project, glycoconjugates and glycans containing the Le X structure will be obtained *in vitro* by enzymatic synthesis using recombinant fucosyltransferases. Furthermore, the effect of the Le X-containing molecules on neuron properties, including neurite outgrowth, will be studied. Le X-containing molecules may also be immobilized in resins, which will be used for the isolation of potential receptors from neuronal cells.

We expect to obtain bioactive fucosylated molecules important in neuroglycobiology, and to understand how Le X affects neurite outgrowth, the underlying mechanism and the molecules involved.

The techniques to be used include i*n vitro* cultures of neuronal cells, SDS-PAGE, immunoblotting, liquid chromatography.