Title: A glycomics approach for the identification of deregulated molecules in Amyotrophic Lateral Sclerosis

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Work plan

Amyotrophic Lateral Sclerosis (ALS) is a rapidly progressive neurodegenerative disease that affects motor neurons, it has an incidence of 2-3/100,000 and has no effective treatment at present. ALS has several pathological features that include protein aggregation due to misfolding, impaired axonal transport, mitochondria damage and apoptosis, fragmentation of the Golgi apparatus, oxidative stress, glutamate induced excitotoxicity, neuroinflammation and transcriptional dysfunction among others. Its main feature is the rapid development of progressive muscular weakness leading to fatal ventilatory failure. Until present, no validated molecular markers of the disease have been identified.

In this project, levels of specific glycoproteins will be detected in biological fluids, including cerebrospinal fluid, of patients with ALS, controls with other neurological disorders and healthy controls. The characterization of protein glycosylation from the cerebrospinal fluid will also be performed.

We expect to identify and characterize possible deregulated glycoproteins and their glycosylation in ALS for a better understanding of the disease and having in view the identification of potential biomarkers.

The techniques to be used include SDS-PAGE, immunoblotting and glycomics techniques.