Abstract

Post-translational modifications are major mechanisms that highly increase the variability in protein function. O-GlcNAcylation and phosphorylation are among the most extensively studied post-translational modifications in research to date. In physiological conditions, O-GlcNAcylation acts as a metabolic sensor that links glucose metabolism to normal neuronal functioning. Reversible phosphorylation is one of the mechanisms that can downregulate metabolism by regulating the rates of flux through metabolic pathways. The impairments in the regulation of these modifications are linked to with neurodegenerative disorders and hypometabolism. This thesis focuses on the crosstalk and correlation between these two modifications, their reciprocal relationship and their mutual impact on their regulations in models of neurodegenerative diseases and disease non-related models.

Keywords: hypometabolism, O-GlcNAcylation, phosphorylation, post-translational modifications, neurodegenerative disorders, hibernation, caloric restriction, memory, learning