Evaluation of the protective effect of *Hypericum perforatum* phenolics compounds, in the toxicity induced by heterologous expression of α-synuclein

Pedro Sousa Vieira[1], Belém Sampaio-Marques[2], Paula Ludovico[2] and Alberto Dias[1]

[1] CITAB-UM, Department of Biology, University of Minho, Campus de Gualtar, 4710-057 Braga, Portugal;

[2]Life and Health Sciences Research Institute (ICVS), School of Health Sciences, University of Minho, Campus de Gualtar, 4710-057 Braga, Portugal.

Parkinson's disease (PD), first described by James Parkinson in 1817, is a chronic, progressive neurodegenerative disorder. The pathologic hallmark is a deterioration of the substantia nigra of yet unknown causes, resulting in a deficiency of dopamine, an important neurotransmitter for the basal ganglia circuit and the presence of cytoplasmic eosinophilic inclusions named *Lewy* bodies, in which α-synuclein is the major constituent. Recent work implicates abnormal protein accumulation, protein phosphorylation, mitochondrial dysfunction and oxidative stress as common pathways implicated in PD pathogenesis. Polyphenolic compounds are commonly found in both edible and medicinal plants, and they have been reported to have multiple biological effects, including antioxidant activity. The budding yeast *Saccharomyces cerevisiae* has been used as a model to study several neurodegenerative diseases, including biological function of α-synuclein, as well as its toxicity. The heterologous expression of wild-type and A53T mutant form of α-synuclein causes toxicity in cells. Therefore, the aim of this study was to evaluate the possible protective effect of *Hypericum perforatum* phenolic compounds (quercetin, kaempferol and biapigenine), in the toxicity induced by the heterologous expression of α-synuclein, using the yeast *Saccharomyces cerevisiae* as a model. Preliminary results indicate that the presence of these phenolic compounds decrease the protein accumulation in cells expressing α-synuclein. We concluded that these phenolic compounds apparently have beneficial biological properties that consequently could have a potential use in preventing Parkinson's disease.

This work was supported by a grant from FCT – Fundação para a Ciência e Tecnologia (PTDC/BIA-MIC/114116/2009 and PTDC/AGR-ALI/105169/2008). B.S.M has fellowships from FCT (SFRH/BD/41674/2007).