



**Research Doctorate (Ph.D.) in Chemical Sciences**

**34<sup>rd</sup> Cycle – Academic Year 2018/2019**

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**Project Information**

**1 - Title**

Effect of Post Translational Modifications on the structure and aggregation propensity of  $\alpha$ -Synuclein

**2 - Key words**

Parkinson's Disease,  $\alpha$ -Synuclein, Amyloid aggregation, Post-Translational modifications

**3 - Abstract**

Alpha-synuclein ( $\alpha$ -syn) is a protein synthesized by the presynaptic terminals able to form fibrillary aggregates, typically associated to neurodegenerative diseases such as Parkinson's Disease. A-syn is an intrinsically disordered protein, which undergoes dramatic conformational changes upon aggregation and/or interaction with biological membranes. Several Post Translational Modifications (PTMs), both physiological (phosphorylation, acetylation) and induced by oxidative stress (glycation, nitration) can alter  $\alpha$ -syn aggregation pathway and toxicity, with still unclarified effects. The PhD candidate will use chemo-enzymatic approaches to introduce appropriate PTMs on recombinant  $\alpha$ -syn. He/she will then perform structure and aggregation studies, by means of spectroscopy and mass spectrometry, on the modified proteins, to shed light on the effects of chemical and environmental factors (salt concentration, pH, metal ions) promoting amyloid aggregation.