

Master Research Project

Design, synthesis and evaluation of metal complexes with Superoxide Dismutase activity

Superoxide radicals are one of the most toxic reactive oxygen species and its damaging effects lead to a variety of detrimental health conditions including cardiovascular diseases, neurodegenerative disorders and other types of age-related diseases. Superoxide dismutases (SODs) are metalloenzymes that catalyze the conversion of superoxide radical to oxygen and hydrogen peroxide at rates approaching the diffusion-controlled limit. Therefore, they play a crucial role in protecting biological systems against the damage mediated by this deleterious radical (oxidative stress).

Following Nature example, this project intends to prepare metal complexes that will mimic the protecting action of the superoxide dismutases eliminating superoxide radicals under physiological conditions. The student will be involved in the design, synthesis and characterization of different ligands capable of coordinating redox active transition metal ions and in the study of their SOD activity.

A student enrolling in this project will gain experience in synthetic chemistry, coordination chemistry, different spectroscopic techniques (UV-Vis, NMR, EPR, CD) and kinetic studies using both indirect and direct methods.

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Area: Chemistry – Biochemistry - Pharmacy

Location: ITQB (Bioinorganic Chemistry and Peptide Design Laboratory) – Oeiras