

Copper(I) Fluorescent Chelator

Copper (Cu) is the third most abundant transition metal in the human body after iron and zinc. It plays a central role in many biological processes (Neurobiology of Disease 1999, DOI : 10.1006/nbdi.1999.0250). When misregulated Cu is however prone to generate reactive oxygen species (ROS) due to its redox ability at physiological potential, which causes catastrophic damage to biologic tissues. Disturbance of its homeostasis is observed in a number of serious diseases including Alzheimer's disease (AD).

The group is actively working on the development of Cu chelators able to sequester Cu and to freeze it under a single redox state (either Cu(I) or Cu(II)) in order to avoid its toxicity in AD context. In order to facilitate the study of those ligands new molecular structure incorporating a fluorescent moieties are envisaged. The object of the present internship is to (1) fine-tune the chelator structure to optimize the efficiency, stability, solubility ... and (2) synthesized rhodol type fluorophores (Figure) to study their fluorescence properties. The best fluorophore obtained will be couple to the Cu-chelators and the fluorescence properties investigate again with and without copper.

The candidate should be a motivated and perseverant person, willing to work on an interface organic chemistry / analytical chemistry in a multidisciplinary environment. The candidate should have a strong background in organic synthesis, and be opened minded to analytical chemistry and inorganic chemistry.

