Universitat Autònoma de Barcelona
Departament de Química
Proposta projecte de Treball Fi de Màster (TFM) curs 2019-2020

(espai màxim 1 pàgina)

Títol del projecte: Bioengineering of Cytochromes P450

Professor que presenta el projecte de TFM: Jean-Didier Maréchal

Resum del projecte proposat: Selective catalytic oxidations are of upmost importance in modern chemistry especially in the view of the current economical and ecological context. Nature has found solutions to this problem where such reactions are catalyzed by metal containing proteins. In particular, cytochrome P450 dependent monooxygenases are ubiquitous hemoproteins that are able to catalyze the oxidation by $\text{O}_2$ of numerous organic compounds. Thus, the elaboration of P450 systems or mimicks has long been a focus of attention in chemical research. There is a huge amount of efforts dedicated to the identification of P450 like systems. One of the approaches consists in the identification of genes coding for the enzymes in as many organisms as possible hoping to identify those that could have industrial use. Another consists in inserting heme like compounds into biological or supramolecular scaffolds.

Our group has a long lasting expertise on the modeling of cytochromes P450 and include the modification of existing P450s or the design of new template. In both lines, we have strong collaborations with worldwide leaders in the field. This TFM consists in getting involved in a new collaboration with professor Stephen Bell at the University of Adelaide (Australia) that experimentally works on the engineering of cytochrome P450 enzymes from metabolically diverse bacteria which are capable of binding and oxidizing a wide range of organic compounds. Among their successes is the recent isolation of P450s that are capable of hydroxylating sesquiterpenoids, steroids, alkanes and polyaromatic hydrocarbons.

The TFM candidate could include a 5 months long stay at the experimental lab in Adelaide (with travel and a certain amount of economical help included). The project is mainly centered on experimental work although the candidate could get trained to computational work if he/she is interested in. There is urgency in the selection of the candidate because of the deadline of the grant allocated. Please contact jeandidier.marechal@uab.cat as soon as possible.

Dades de contacte amb el professor: Prof. Dr. Jean-Didier Maréchal
Direcció correu electrònic: jeandidier.marechal@uab.cat
Número telèfon: +34.935814936