ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ
ΤΜΗΜΑ ΕΠΙΣΤΗΜΗΣ ΚΑΙ ΤΕΧΝΟΛΟΓΙΑΣ ΥΛΙΚΩΝ

ΠΑΡΟΥΣΙΑΣΗ ΜΕΤΑΠΤΥΧΙΑΚΗΣ ΔΙΠΛΩΜΑΤΙΚΗΣ ΕΡΓΑΣΙΑΣ

Τίτλος

«Σύνθεση Λειτουργικών Υβριδίων Πρωτεΐνης Πολυμερούς και Βιοδιασπώμενων Πολυμερών»

«Synthesis of Functional Protein-Polymer Conjugates and Biodegradable Polymers»

της **Μαρίας Χρυσής Ιζαμπέλλας Μπαλτζάκη,**μεταπτυχιακής φοιτήτριας του

Τμήματος Επιστήμης και Τεχνολογίας Υλικών του Πανεπιστημίου Κρήτης

Επιβλέπουσα Καθηγήτρια: Καλλιόπη Βελώνια

Τετάρτη 09/11/2022

12:00

Η παρουσίαση θα πραγματοποιηθεί στην **αίθουσα Α210 του Τμήματος Μαθηματικών και Εφαρμοσμένων Μαθηματικών** του Πανεπιστημίου Κρήτης.

ABSTRACT

Protein-polymer conjugates are biohybrid macromolecules designed to combine the functionality, activity and selectivity of biomolecules with the stability and vast chemical diversity of synthetic polymers. Such protein-polymer chimeras can either retain their original features or display new physical and/or chemical properties not seen in the individual moieties -such as phase separation or self-assembling behaviour- while, at the same time the stability, biocompatibility and solubility of the parent protein can be potentially improved. In the past few years, protein-polymer conjugates have gained interest due to their potential for applications in many fields ranging from nanotechnology to biomedicine.

Recently, oxygen-tolerant, copper-mediated (photo)polymerisation approaches were developed for the grafting of a variety of monomers *from* different proteins without the need for deoxygenation or other tedious reaction conditions. This Thesis contributed to the evaluation of the optimal conditions of an oxygen-tolerant, aqueous copper-mediated polymerization approach, and its scaling up. Aiming to expand the scope, the grafting *from* different proteins was explored. More importantly, based on this synthetic method, an alternative, ligand-free synthetic procedure was developed to readily afford protein-polymer bioconjugates. A plethora of monomers including styrene, acrylates, methacrylates, acrylamides and renewable monomers were grafted *from* protein macroinitiators to yield a wide variety of biohybrids with amphiphilic or hydrophilic character as well as triblock bioconjugates exhibiting interesting self-assembling patterns.

In parallel, in the context of the Biowaste to Bioplastic program B2B, PLLA was synthesised via azeotropic dehydration followed by polycondensation polymerisation and characterized.