ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ
ΤΜΗΜΑ ΕΠΙΣΤΗΜΗΣ & ΤΕΧΝΟΛΟΓΙΑΣ ΥΛΙΚΩΝ

UNIVERSITY OF CRETE
DEPARTMENT OF MATERIALS SCIENCE & TECHNOLOGY

ΠΡΟΣ

1) Όλα τα μέλη ΔΕΠ του Τμήματος Επιστήμης και Τεχνολογίας Υλικών

2) Την Επταμελή Εξεταστική Επιτροπή

3) Όλα τα μέλη της Πανεπιστημιακής Κοινότητας

Πρόσκληση σε Δημόσια Παρουσίαση της Διδακτορικής Διατριβής της

κ. Χρυσούλας Κοκοτίδου

(Σύμφωνα με το άρθρο 41 του Ν. 4485/2017)

Τη **Δευτέρα 2 Δεκεμβρίου 2019** και ώρα **16:00** στην **αίθουσα Κ206** στο κτήριο **Τμήματος Επιστήμης Υπολογιστών**, Πανεπιστημίου Κρήτης, θα γίνει η δημόσια παρουσίαση και υποστήριξη της Διδακτορικής Διατριβής της υποψήφιας διδάκτορος του Τμήματος Επιστήμης και Τεχνολογίας Υλικών κ. Χρυσούλας Κοκοτίδου με θέμα:

«Σχεδιασμός Πρωτεϊνικών και Πεπτιδικών Υλικών για Χρήση σε Νανοτεχνολογικές Εφαρμογές»

«Design of Protein and Peptide Materials for use in Nanotechnological Applications»

Abstract:

Protein and peptide materials with a defined morphology are increasingly used in a wide area of applications. Advantages that characterize proteinaceous biomaterials are their inherent biocompatibility, biodegradability and flexibility of their design and fabrication. The present thesis is focused on the design and study of such biomaterials using as model system a natural fibrous protein, the adenovirus fiber. The Adenovirus fiber protein is a homotrimer consisting of an N-terminal tail, a long shaft, and a C-terminal knob region that is responsible for high-affinity receptor binding. A series of constructs were designed having as template the shaft segment of the Ad2 fiber protein and inserting functionalities through molecular cloning techniques. The chimeric proteins were rendered more stable and were targeted for potential use as delivery agents and gene therapy applications.

Amyloid fibrils, derived from the studied adenovirus shaft sequences and from a common sequence to Alzheimer's Aβ peptide and HIV-1 V3 loop, due to their intrinsic mechanical properties are excellent candidates for use as scaffolds. By applying computational methods, the peptides can be rationally designed through mutation of regions amenable to modification aiming at the fabrication of biomaterials with 'on demand' functionalities. An essential part of this PhD study was focused on the experimental study of two rationally and computationally designed peptides that are positively charged and have the ability to bind DNA and internalize the cell while carrying the packaged plasmid DNA.

In another aspect of this study instead of exploiting amyloid fibrillization advantages, we sought to inhibit or hinder the process of amyloid fibril formation. The designed peptide was inspired from the aforementioned natural sequences. This peptide despite its similarity with amyloid forming sequences, contains the beta breaker residue (proline) and as a result fails to self-assemble into amyloid fibrils and can provide information that could serve as the basis for structure-based design of potential inhibitors of amyloid formation.