



Institute for the Physics of living Systems
Department of Physics & Astronomy
University College London
Gower Street, London, WC1E 6BT

Title: **Pathways of functional and pathological protein aggregation**
Institution: University College London
Department: Institute for the Physics of Living Systems
Department of Physics & Astronomy
PhD supervisor: Dr Andela Saric
Application deadline: 1st March 2016, or until available
Starting date: 1st September 2016
Funding availability: EU/EEA

We are inviting applications for a fully funded 3.5-year PhD studentship in the area of **computational and theoretical biophysics**, carried out jointly in the **Department of Physics & Astronomy** and the **Institute for the Physics of Living Systems** (IPLS) at UCL. IPLS is a dynamic interdisciplinary institute, with a goal to promote physical approaches to biology, and catalyse interactions between theorists and experimentalist.

This research group uses computer simulations and techniques from soft matter and statistical physics, to address biologically relevant questions. We are seeking a bright and motivated PhD student to contribute to understanding pathways of functional and pathological protein assembly. The fundamental question we ask is: how does a large number of macromolecules collectively assemble into microscopic aggregates under various environmental factors, that can be either functional or pathological. Two examples include functional dynamic aggregation of protein fibrils in the extracellular matrix, rigorously controlled by the cell, and uncontrolled aggregation of proteins into amyloid plaques, involved in Alzheimer's and Parkinson's diseases.

Microscopic mechanisms of these biological processes are difficult to directly probe experimentally, and unattainable via fully atomistic computer simulations. Our goal is to identify them using simple physical (coarse-grained) models and statistical physics. Our strategy is to obtain observables which can be directly compared with experimental measurements. This will give us insights into how cells regulate functional assembly, and how to circumvent pathological protein aggregation. The project involves collaboration with experimentalists, for which IPLS and the London area are an ideal environment.

The student will gain a detailed understanding of computer simulations and scientific computing, as well as a broad knowledge of soft matter and biophysics. Candidates with a high grade point average Bachelor's, MSci or Master's degree (or equivalent) in Physics, Chemistry, Applied Maths, or related disciplines, interested in answering biological questions, are encouraged to apply. Previous exposure to computer programming is desirable.

The stipend is £16,057 p.a. and tuition fees will be covered. Funding is available to UK and EU/EEA candidates.

Qualified, eligible and motivated candidates should send their CV, a brief statement, and contacts of two referees to Dr Andela Saric (as898@cam.ac.uk), highlighting academic excellence and previous research experience. Early applications are advisable.