



PhD Project Title: A computational framework for the 3D structural analysis of KRAS-mediated signaling pathway rewiring in colon cancer.

A PhD position is now available in Systems Biology Ireland, University College Dublin, to investigate how cellular signaling pathways are quantitatively rewired in colon cancer.

Location: Systems Biology Ireland, University College Dublin, Dublin, Republic of Ireland

Supervisor: Dr. Christina Kiel

Project Background & Description:

Systems Biology Ireland (<http://www.ucd.ie/sbi/>) established in 2009 under Science Foundation Ireland's CSET initiative, has successfully developed an integrated mathematical modelling and experimental research programme focusing on the design of new diagnostic and therapeutic approaches to diseases, primarily cancer, based on a systems level, mechanistic understanding of cellular signal transduction networks. To accomplish these goals, SBI uses mathematical and computational modelling approaches in combination with cutting edge experimental technologies in proteomics, genomics, advanced microscopy and flow cytometry as well as cell biology and molecular biology methods. SBI's expertise, particularly in the area of modelling in systems pharmacology and therapeutics, strategically position it at the crossroads between biology and medicine.

The purpose-built SBI facility, supported by the HEA's PRTL15 programmes sits in the space between the UCD Conway Institute and the Health Sciences Centre (School of Medicine and Medical Sciences). It is physically linked to both buildings, providing access to existing technology platforms, educational and conference facilities and ideally placed to train allied healthcare professionals. The facility houses a multidisciplinary team of some 50 researchers including bioinformaticians, statisticians, computational scientists and modellers, engineers, biologists, biochemists and physicists.

This PhD student post will be part of an interdisciplinary team working on the quantitative and systems analysis of signaling networks in colon cancer. This study is funded through Science Foundation Ireland and UCD Research (Strategic and Major Initiatives Scheme 2018). The project will investigate how signalling and protein interaction networks are context-specific quantitatively modulated in (patho)physiologically-relevant primary cells and in vivo-like 3D model systems. Specifically, personalized computational models of ubiquitous KRAS complexes and signaling networks will be generated by (i) substituting canonical enzymatic parameters with patient-specific values arising from specific mutations affecting catalytic activities

and binding interfaces, and (ii) incorporating patient-specific gene and protein expression measurements.

The student will gain valuable knowledge in the 3D structural analysis of KRAS-mediated signal transduction networks in colon cancer, protein design and engineering techniques, and computational modeling tools. The student will also be involved in the experimental aspects of the project through interaction with other researchers in the team.

Person Specification:

We are looking for a highly motivated, passionate PhD candidate with the ability to independently plan and conduct the research project while integrating into an interdisciplinary research environment. Applicants should have, or expect to obtain, a first or upper second class honours Bachelors or Masters degree in Computational Biology, Bioinformatics, Systems Biology or related fields. Excellent analytical and communication skills are preferable.

Stipend & fees: The successful candidate will receive a tax-free stipend of €18,500 per annum. €6,810 will be made available towards registration fees per annum. The position is funded for four years.

Application procedure: Please send a cover letter, CV and accompanying documentation including references to Dr Christina Kiel. Email address: christina.kiel@ucd.ie

Closing date: Applications should be received by June 24, 2018.

Web:

The University: <http://www.ucd.ie/aboutucd.htm>

The School of Medicine and Medical Sciences: <http://www.ucd.ie/medicine/>

Systems Biology Ireland: <http://www.ucd.ie/sbi/>

Kiel group: <http://www.ucd.ie/sbi/research/researchgroups/kielgroup/>