

## **Title: Bioinformatics internship**

**Duration:** 10 weeks (preferred start date by the 1st of July 2022)

**Location:** Dublin, Ireland or remote

### **Project background and description**

Our group at the Royal College of Surgeons in Ireland is working on a commercially-oriented project funded by Enterprise Ireland. We are creating a platform for discovering new drug targets and helping with other aspects of drug discovery. Currently, a large source of drug failure (40 to 80%) in clinical trials is the lack of efficacy, which is mainly due to erroneous choice of drug targets and the inability to select responsive patients for trials. A precise mechanistic understanding of the function of cancer cell signalling networks will lead to the choice of better drug targets and better patient stratification. We are currently developing a large-scale digital copy of signalling pathways in melanoma; we employ primarily a data-driven approach, which involves the generation of large omics datasets coming from a physiologically relevant experimental system (patient-derived cells in 3D cell cultures). Network inference algorithms will be applied to the data to generate the digital copy, which will then be tested for its ability to generate useful predictions.

### **Internship Description**

We are seeking graduate students (or last year undergraduate) for a 10-week internship during summer of 2022. The aim of this internship is to aid building a mathematical model of pathways involved in cell division in melanoma context that will be used to predict new drug perturbations. The specific tasks of the internship will include time-series analysis of phosphoproteomics datasets with the aim of identifying phosphosite specific patterns and the analysis of mRNA expression datasets to identify physiologically relevant gene signatures and associated regulating transcription factors.

#### **Requirements:**

- Currently enrolled in a graduate program or in the last year of an undergraduate program at a university in Computational Biology, Systems Biology, Bioinformatics, or a related discipline.
- Solid background in Molecular Biology.
- Programming experience in at least one of Julia (preferred), Python, or R.
- Experience working with large datasets, especially time series analysis (preferred).
- Familiarity with kinase enrichment, gene enrichment, or transcription factor enrichment analysis (preferred).
- Good communication and writing skills.
- Strong organizational skills and independence.

What We Offer:

- You will have the opportunity to work on a commercially relevant project in a rapidly advancing field.
- You will become familiar with biological pathway modelling and develop new bioinformatics skills.
- You will develop skills in the Julia programming language.
- You will be able to improve your English communication skills.

We would prefer to have your application before the middle of June 2022. If you are interested please send your CV to: [katiarybakova@rcsi.ie](mailto:katiarybakova@rcsi.ie) or [alasri@rcsi.ie](mailto:alasri@rcsi.ie)