Newcastle University PhD Studentship award

Title
Harnessing advances in differential geometry to improve the efficiency of drug discovery

Value of award
Full UK/EU fees (eligibility criteria applies to EU students) and annual living allowance of £14,777 (at the 2018/19 UKRI rate.)

Number of awards
1

Start date and duration
September 2019 for 3.5 years

Application closing date
31st January 2019

Overview
A fully funded Ph.D. studentship is available at Newcastle University, focusing on the design and application of novel mathematical / computational approaches to advance anti-cancer drug discovery programmes.

This multi-disciplinary proposal aims to harness recent ideas coming from differential geometry, some of the mathematics behind superstring theory, to create a new tool for high-throughput computational drug design. Superstring theory famously requires the existence of extra spatial dimensions. Importantly, mathematicians and physicists have developed a range of techniques that allow them to efficiently encode the properties of shapes in these extra dimensions. This project will apply these mathematical techniques to efficiently describe the 3-dimensional shapes of potential drug molecules, it will use data science techniques (including machine learning and artificial intelligence) to search chemical databases for molecules with similar properties, and it will use computational drug design to validate the effectiveness of these molecules.

The student will work closely with the Drug Discovery Group at Newcastle University with the goal of establishing these computational methods as a standard tool in the drug discovery pipeline. The supervisory team will provide highly sought-after training in the fields of computational medicinal chemistry, software design, and data science. As such, this project is ideal for a candidate with a solid theory background, and ambitions towards a career in the pharmaceutical industry or academic drug discovery.

Sponsor
Engineering and Physical Sciences Research Council (EPSRC)

Name of supervisor(s)
Dr. Daniel Cole (School of Natural & Environmental Sciences)
Dr. Stuart Hall (School of Mathematics, Statistics & Physics)
Dr. Matthew Forshaw (School of Computing)
Eligibility Criteria
The successful candidate will have a degree (at least 2:1 or equivalent) in mathematics, physics, chemistry, or a related subject. Good programming skills are desirable, but not essential.

How to apply
You must apply through the University’s online postgraduate application system. To do this please ‘Create a new account’.

The following information will help us to process your application. You will need to:
• insert the programme code **8100F** in the programme of study section
• select **PhD CHEM (FT)** as the programme of study
• insert the studentship code **NES011** in the studentship/partnership reference field
• attach a covering letter and CV. The covering letter must state the title of the studentship, quote reference code **NES011** and state how your interests and experience relate to the project
• attach degree transcripts and certificates and, if English is not your first language, a copy of your English language qualifications.

Contact
For any questions about the post, please contact Daniel Cole (daniel.cole@ncl.ac.uk).