

School of Chemical Sciences, Dublin City University, Glasnevin, Dublin 9 IRELAND

07/09/2022

# 4-Year PhD Scholarship in the Kellett Research Group (Cu-TherON)

Dublin City University (www.dcu.ie) is a research-intensive, globally-engaged, dynamic institution that is distinguished both by the quality and impact of its graduates and by its focus on the translation of knowledge into societal and economic benefit. Through its mission to transform lives and societies through education, research and innovation, DCU acts as an agent of social, cultural and economic progress. DCU is Ireland's fastest growing university, and now hosts more than 17,000 students across its three academic campuses: DCU Glasnevin Campus, DCU St Patrick's Campus and DCU All Hallows campus. DCU has a strong track record in attracting both Irish and European Union funding under FP7, Horizon 2020, Marie Curie Actions and Erasmus. We offer a dynamic and internationally focused environment in which to advance your academic career.

### **School of Chemical Sciences**

The School of Chemical Sciences is one of Ireland's most progressive and highest achieving Schools with outstanding facilities, housed within a modern and dynamic city campus. Our goal is to develop graduates with the ability to critically evaluate, and then to solve, chemical and pharmaceutical problems, preparing the highest quality graduates capable of meeting the challenges of modern industry and research. The School is highly successful at attracting large scale research funding, with our researchers having significant roles within nationally significant university/industry collaborative initiatives and European funded Integrated Training Networks. The School is one of the leading academic schools within DCU and is ranked in the top 300 chemistry schools/departments in the world (QS Rankings), a reflection of the School's ambitious research activities and its undergraduate/postgraduate degree programmes.

### Background

This is an opportunity to join a fully funded PhD position (4-years) in the area of artificial gene editing. You will become part of a larger Irish Research Council (IRC) research project called *ENACT: Gene Editing with Nucleic Acid Click Chemistry* which seeks to develop a breakthrough class of artificial gene editing system for the treatment of human cancer. The technology is based on conjugating a therapeutic oligonucleotide (TherON) probe to a metal complex that can trigger targeted damage at the DNA interface. In this project you will target unique base-base sequences present in genetic elements of recalcitrant cancers including triple negative breast cancer (TNBC) and glioblastoma multiforme (GBM). Using 'click chemistry' technology, each TherON will carry a unique artificial metallonuclease (AMN) programmed to direct cutting a specific genetic locus that leads to targeted tumour destruction.

As a PhD candidate you will be registered in the structured PhD programme at DCU within the School of Chemical Sciences under the supervision of Associate Professor Andrew Kellett.

# **Project Description: Synthesis & biological evaluation of novel artificial metallonucleases for gene-targeted therapy:**

- Main areas of expertise/skills training which will be undertaken by the candidate include:
  - Inorganic synthesis of new azide-containing copper complexes, nucleic acid click chemistry, molecular biology.
  - Nucleic acid chemistry, click chemistry, and the preparation of chemically modified oligonucleotides by solid-phase and enzymatic synthesis.
  - Molecular biology and biophysical analysis to assess the biological activities of new hybrid TherONs.
  - Cell-free assay development for the screening of hybrid TherONs including encapsulation efficiency in liposomes and delivery capability.

# **Duties and Responsibilities:**

- Conduct a specified programme of research under the supervision and direction of the Principal Investigator (PI).
- Assist the PI and research group in the design and development of the research programme.
- Disseminate research results through journal publications and at scientific meetings.
- Engage in scientific communication and tutor undergraduate research students working in the laboratory.

# **Applicant Requirements:**

Applicants will ideally have an M.Sc. in organic, (bio)inorganic or medicinal chemistry or a B.Sc. (Hons) with medicinal or (bio)inorganic chemistry experience. Applicants with equivalent experience in biochemistry are also welcome to apply. An excellent track record in laboratory skills directly related to the project is essential. Excellent communication skills in English, both written and spoken, are also essential.

# **Eligibility:**

Applicants from all countries are eligible.

# **Conditions:**

Applicants at the time of recruitment must not yet have been awarded a doctoral degree and must meet the DCU postgraduate research entry requirements.

# **Application procedure:**

Applications must be emailed to <u>andrew.kellett@dcu.ie</u> and contain a cover / motivational letter, full CV, and a list of three suitable referees.

# Application deadline: September 28<sup>th</sup> 2022.