Research Centre	School of Chemical Sciences
Post title	Postdoctoral Researcher Bioinorganic and Nucleic Acid Chemistry
Level on Framework	Level 1
Post duration	Fixed term contract up to 2 years

Dublin City University

Dublin City University (DCU) is a young, ambitious and vibrant university, with a mission 'to transform lives and societies through education, research, innovation and engagement'. Known as Ireland's 'University of Enterprise', DCU is a values-based institution, committed to the delivery of impact for the public good. DCU was named Sunday Times Irish University of the Year 2021.

DCU is based on three academic campuses in the Glasnevin-Drumcondra region of north Dublin. More than 18,000 students are enrolled across five faculties – Science and Health, DCU Business School, Computing and Engineering, Humanities and Social Sciences and DCU Institute of Education.

DCU is committed to excellence across all its activities. This is demonstrated by its world-class research initiatives, its cutting-edge approach to teaching and learning, its focus on delivering a transformative student experience, and its positive social and economic impact. The university continues to develop innovative programmes in collaboration with industry, such as the DCU Futures suite of degrees, which are designed to equip graduates with the skills and knowledge required in a rapidly evolving economy.

DCU's pursuit of excellence has led to its current ranking among the top 2% of universities globally. It is also one of the world's Top Young Universities (QS Top 100 Under 50, Times Higher Top 150 Under 100). In the Times Higher Education University Impact Rankings 2021, DCU ranked 23rd in the world for its approach to widening participation in higher education and its ongoing commitment to eradicating poverty, while it ranks 38th globally for its work in reducing inequality and 89th globally for gender equality.

The university is ranked 23rd in the world and first in Ireland for its graduate employment rate, according to the 2020 QS Graduate Employability Rankings. Over the past decade, DCU has been the leading Irish university in the area of technology transfer, as reflected by licensing of intellectual property.

As part of this role the researcher will be required to participate in the DCU Research Career Framework. This framework is designed to provide significant professional development opportunities to Researchers and offer the best opportunities in terms of a wider career path.

Background & Role

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.

This is a postdoctoral fellowship available for a period of 2-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. The position is fully funded and you will work under the guidance of Associate Professor Andrew Kellett in the School of Chemical Sciences

Principal Duties and Responsibilities

Reporting to their Principal Investigator the Postdoctoral Researcher will:

- Conduct a programme of research to develop, characterise, and assess the biological activity of platinum, copper, and ruthenium hybrid metallodrug-oligonucleotides under the supervision and direction of the Principal Investigator.
- To prepare therapeutic oligonucleotide hybrid drugs using a combination of solid-phase synthesis and enzymatic synthesis together with nucleic acid click chemistry.
- To develop a library of azide-modified metal complexes, characterise these agents fully using a range of methods, and to hybridise them to oligonucleotides targeted to specific cancer-causing genes.
- To assess the in vitro and in vivo activity of hybrid drugs developed.
- Transfer knowledge in synthetic chemistry, characterisation, and chemical biology to PhD and other researchers in the group.
- Assist in identifying and developing future research and funding initiatives, specifically through SFI, the Irish Research Council, and the European Union.
- Engage in the dissemination of the results of the research in which he/she is engaged with the support of and under the supervision of the Principal Investigator. This includes drafting and preparing manuscripts, publishing high-quality research papers in top-tier

journals, and preparing high-quality posters and presentations for use in local and international conferences.

- Supervise and assist final year undergraduate students and ERASMUS students working in this area within their research projects.
- Take advantage of training and development opportunities available within the School or Research Centre, or the University.
- Engage in teaching and teaching of undergraduates in the areas of medicinal and inorganic chemistry as assigned by the Head of School under the direction of the Principal Investigator.
- Liaise with both internal and external stakeholders including industry and academic partners/collaborators, specifically those involved in the synthesis of oligonucleotides.
- Carry out administrative work associated with the programme of research as necessary. This includes data preparation, figure preparation, and report writing to specific funding agencies.

Qualifications and Experience:

Essential

- Applicants should have a PhD in synthetic chemistry with experience in inorganic, nucleic acid, and click chemistry essential.
- The candidate should have expertise in isolating small molecules and inorganic compounds, NMR, IR, UV-vis, fluorescence, PCR, thermal melting, LC-MS, and in nucleic acid chemistry, isolation, and purification techniques.

Desirable:

- Experience in molecular / biophysical assays used to determine the stability and targeting properties of therapeutic oligonucleotides.
- Excellent communication and English writing skills are required.

Candidates will be assessed on the following competencies:

Discipline knowledge and Research skills – Demonstrates knowledge of a research discipline and the ability to conduct a specific programme of research within that discipline.

Understanding the Research Environment – Demonstrates an awareness of the research environment (for example funding bodies) and the ability to contribute to grant applications.

Communicating Research – Demonstrates the ability to communicate their research with their peers and the wider research community (for example presenting at conferences and publishing research in relevant journals) and the potential to teach and tutor students.

Managing & Leadership skills - Demonstrates the potential to manage a research project including the supervision of undergraduate students.