University of Nottingham
UK | CHINA | MALAYSIA

Role profile

Job title	Research Associate/Fellow (Lung Gene Therapy)	Job family and level	Research and Teaching Level 4 (Appointment will be Level 4 Career training grade where an appointment is made before PhD has been completed)
School/ Department	Pharmacy	Location	University Park Campus

Purpose of role

We are currently seeking two Research Associate/Fellows to join a multidisciplinary research project funded by the Cystic Fibrosis Foundation (CFF) – 'Mucus-penetrating Peptide Nanoparticles for gene augmentation of CFTR' - to undertake research on the design and development of a novel class gene therapy for the genetic correction CF by gene augmentation and gene editing strategies. The successful candidates will join highly motivated and well-funded research teams within the Schools of Pharmacy and Medicine, co-located in state-of-the-art facilities in the multidisciplinary University of Nottingham Biodiscovery Institute (BDI) on the main University Park campus. This project is in collaboration with Johns Hopkins University (JHU) USA, and the University of Edinburgh (Roslin Institute).

1. Design, develop and execute formulation of gene delivery peptide nanoparticles. These activities involve: 1) nanoparticle formulation/characterisation, 2) in vitro assessments using human airway cell cultures and Ussing analyses, 3) Aiding the JHU team in vivo testing, 4) Aiding the Edinburgh team in in vivo testing, 5) Synergising with a second fellow working on vector engineering and gene editing aspects of the project. S/he will be a cell-culture expert and be heavily involved in the ALI culture set up and Ussing analyses. This researcher will be the primary interaction with the JHU team who will complete the in vivo aspects of testing. S/he will visit JHU for 3 months and will also be the primary interaction with the university of Edinburgh group who will carry out the large animal trials.

2. Design, develop and execute strategies for gene augmentation and editing of the CFTR gene for CF correction. These activities involve: 1) vector design formulation/characterization, 2) in vitro assessment of editing using human airway cell cultures, 3) Synergising with a second fellow working on the nanoparticle formulation aspects of the project.

	Main responsibilities (Primary accountabilities and responsibilities expected to fulfil the role)	**% time per year**
1	**Position 1:** **Plan and conduct supervised research using recognised approaches, methodologies and techniques within the general area of nanoparticle formulation technology. This will include but is not limited to:** • Nanoparticle formulation analyses using electron microscopy, particle sizing, complexation assays, and plate-reader based assays	45 %

	• Lung cell culture assays of transfection using reporters and employing immunofluorescence • Confirmation of barrier integrity and longevity of expression in lung cultures • Conducting mucus diffusion assessments and MPT analyses • Set up of Ussing chamber assays for the correction of CFTR phenotype in patient cell cultures • Liaising with JHU and Edinburgh tests for animal trials **Position 2:** **Plan and conduct supervised research using recognised approaches, methodologies and techniques within the general area of gene editing and vector engineering. This will include but is not limited to:** • Design and molecular cloning/engineering of gene editing vectors • Development of CRISPR, HITI, Rep and transposon strategies and testing • Lung cell culture assays of transfection and editing efficiency • Molecular analyses of targeting and off-targeting • Immunolabelling confirming cell-types corrected	
2	Analyse data, interpret reports, evaluate and criticise texts and bring new insights to research area.	10 %
3	Prepare research work for publication and/or contribute to the dissemination to relevant groups including external bodies and conferences, resulting in successful research outputs. Assist in the preparation of scientific reports and publications for the grant programme.	10 %
4	Co-ordinate the operational aspect of research networks, for example, arranging meetings and updating web sites etc. and contribute to collaborative decision making with colleagues in area of research.	5 %
5	Work in conjunction with others in the research team to achieve objectives and make an active contribution to the success of the team. Provide support, guidance and supervision to other staff, where appropriate in own area of expertise.	5 %
6	Develop research objectives and proposals for own and/or collaborative research area.	5 %
7	Identify opportunities and assist in writing bids for research grant applications. Prepare proposals and applications to both external and/or internal bodies for funding, contractual or accreditation purposes.	5 %
8	Build relationships with both internal and external contacts in order to exchange information, to form relationships for future collaborations and identify potential sources of funds and/or opportunities for collaboration.	5 %
9	Assist in the supervision of undergraduate and/or postgraduate students projects and placements. To participate in the assessment of student knowledge and co-supervise projects at Masters level.	5 %

10	Contribute to the organisation of research resources and facilities, laboratories and workshops as appropriate. Undertake general laboratory duties such as ordering of reagents, equipment maintenance, and laboratory housekeeping.	5 %

Person specification

	Essential	Desirable
Skills	▪ Ability to competently plan and execute challenging cell and molecular experiments. ▪ Experience of transfection technologies and cell analyses such as immunofluorescence and flow cytometric analyses. ▪ A strong commitment to interdisciplinary research, in particular between molecular biology, gene editing and cell biology. ▪ Excellent oral and written communication skills, including the ability to communicate complex information with clarity and write to a publishable standard. ▪ Strong analytical skills including the ability to analyse data, interprets reports, evaluate and criticise texts and bring new insights. ▪ Ability to work to deadlines and prioritise tasks. ▪ Excellent problem solving, IT and organisational skills. ▪ Ability to build effective relationships as part of a team and collaborate with others, both internally and externally.	▪ Familiarity with all aspects of Cystic Fibrosis, gene therapy approaches and nanoparticle technologies. ▪ Strong understanding and an ability to use the full range of cell-based assay techniques (reporter assays, metabolic activity). ▪ Familiarity with respiratory ALI differentiation cultures as models for human lung ▪ Competency in modern methods of DNA analyses and sequencing. ▪ Familiarity and evidence of competence in vector design and engineering ▪ Experience of using Ussing chambers to analyse CFTR correction
Knowledge and experience	▪ Presenting work effectively to a variety of professional and academic audiences at meetings and conferences. ▪ A consistent track record of published research in peer-reviewed journals and writing high quality reports and papers for publication.	▪ First author publications in high impact factor journals. ▪ Experience of developing new approaches, models, techniques or methods in chemical biology. ▪ Training and/or supervision of research staff or students (undergraduates and postgraduates).
Qualifications, certification and training (relevant to role)	▪ A first or upper-second class honours degree in chemistry or equivalent. ▪ A PhD submitted or awarded in chemical biology, medicinal chemistry or equivalent.	▪ PhD or postdoctoral experience in the total chemical synthesis of challenging and complex organic compounds.

Athena SWAN Silver Award

The University of Nottingham is focused on embedding equality, diversity and inclusion in all that we do. As part of this, we welcome a diverse population to join our work force and therefore encourage applicants from all communities, particularly those with protected characteristics under the Equality Act 2010.

Expectations and behaviours

The University has developed a clear set of core expectations and behaviours that our people should be demonstrating in their work, and as ambassadors of the University's strategy, vision and values. The following are essential to the role:

Valuing people	Is always equitable and fair and works with integrity. Proactively looks for ways to develop the team and is comfortable providing clarity by explaining the rationale behind decisions.
Taking ownership	Is highly self-aware, looking for ways to improve, both taking on board and offering constructive feedback. Inspires others to take accountability for their own areas.
Forward thinking	Driven to question the status quo and explore new ideas, supporting the team to "lead the way" in terms of know-how and learning.
Professional pride	Sets the bar high with quality systems and control measures in place. Demands high standards of others identifying and addressing any gaps to enhance the overall performance.
Always inclusive	Ensures accessibility to the wider community, actively encouraging inclusion and seeking to involve others. Ensures others always consider the wider context when sharing information making full use of networks and connections.

Key relationships with others