University of Nottingham
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ROLE PROFILE

Job Title:	Research Associate/Fellow in Data science applied to biological problems, Green Chemicals Beacon
School/Department:	School of Veterinary Medicine and Science
Job Family and Level:	Research and Teaching Level 4
Contract Status:	This post will be offered on a fixed-term contract until 30 June 2022
Hours of Work:	Full-time (36.25 hours per week)
Location:	School of Veterinary Medicine and Science, Sutton Bonington Campus
Reporting to:	Dr Tania Dottorini

Background to the Role: The Government's White Paper 'Industrial Strategy – Building a Britain fit for the future' (November 2017) has identified maximising the advantages for UK industry from the global shift to clean growth, as one of four grand challenges. The Secretary of State for Business, Energy and Industrial Strategy, Greg Clark, has stated that 'The move to cleaner economic growth is one of the greatest industrial opportunities of our time.' (The Clean Growth Strategy – Leading the way to a low carbon future, October 2017). This appointment will ensure that the University of Nottingham makes an impact on rapidly shifting practices in sustainable manufacturing associated with global clean growth strategies through excellence in bioinformatics and machine learning.

This appointment is firmly aligned with the University's Research Strategy which is accompanied by a major investment into the University's Green Chemicals Beacon of Excellence. As part of the University's expansive vision to address global challenges, the Green Chemicals Beacon aims to secure the low carbon economy of the future. Through this multi-disciplinary effort, the Green Chemicals Beacon will address several UN Sustainable Development Goals, such as Climate Action and Sustainable Industrialisation, by:

- Focusing on carbon feedstocks derived from waste outside the food value chain with minimal impact on land security;
- Spearheading the transformation from a petrochemical, energy intensive economy to a sustainable and more circular economy;
- Gearing research activity towards processes with favourable Life Cycle Analysis (LCA) outcomes.

The Green Chemicals Beacon integrates metabolic engineering, process development and green chemistry into a sustainable manufacturing paradigm. The Beacon aims to speed the development cycles through the technology readiness levels, particularly blending advances in computational chemistry, big data analytics and machine learning with world leading white biotechnology and enzyme engineering. Integrated, continuous processing is at the heart of the Beacon's vision, facilitating technology demonstration from carbon feedstock to purified product at large laboratory scale. Achieving these objectives, the Beacon will establish three application platforms harnessing emerging technologies to realise sustainable processing, viz. (1) an aromatics platform, (2) an aldehyde platform and (3) a terpenoid platform.

Through its investment in the Green Chemicals Beacon, the University strongly believes the next global industrial revolution will be driven by a step change in sustainable processing; where this appointment in machine learning will strengthen collaborations across the University, international academics and industry. Training and development opportunities will be also offered by the Digital Research Service at the University of Nottingham.

Purpose of the Role:

This role is integrated into a number of collaborative and interdisciplinary projects, viz. (1) an aromatics platform, (2) an aldehyde platform and (3) a terpenoid platform; aligned with the Green Chemicals Beacon research activity portfolio:

- To develop and apply transferable machine learning strategies and automated workflows, informing metabolic engineering strategies.
- To develop machine learning methods, enabling the optimisation of microbial cell factories.

The person appointed will join the School of Veterinary Medicine and Science, who have an extensive track record and expertise in systems biology and bioinformatics. The person appointed will be expected to plan, conduct and analyse research in this area and will be responsible for writing up work for publication and presentation at scientific meetings.

	Main Responsibilities
1.	To plan and conduct primary research towards the goals of the research project. To analyse data, interpret reports, evaluate texts and bring new insights to the research area.
2.	To write up research work for publication and contribute to the dissemination of research outputs at scientific conferences. To assist in the dissemination of research outputs to the general public.
3.	To identify opportunities and assist in writing bids for research grant applications.
4.	To supervise undergraduate and postgraduate students projects, where these fall within the goals of the research project.
5.	To liaise with other members of the research groups in the School of Chemistry and the Faculty of Engineering and wider Green Chemicals Beacon community and ensure the co-ordination of work and sharing of data generated.

Knowledge, Skills, Qualifications & Experience

	Essential	**Desirable**
Qualifications/ Education	• PhD (or very close to completion). Preferably in epidemiology or data science. Alternatively, PhD (or very close to completion) in statistics, mathematics, machine learning, computational biology.	• PhD with a strong emphasis on systems biology, computational biology or bioinformatics in general.
Skills/Training	• In-depth expertise in the use of advanced statistical modelling and machine learning for data analysis in biological problems, preferably related to heterogeneous, complex large-data, such as multiomics data. • Experience in creating machine learning tools and methodologies. • Strong programming skills in a suitable language (e.g. Matlab, Python, R. etc).	• Expertise in the use of advanced statistical modelling and machine learning for incorporating omics data sets into genome scale modelling. • Expertise in the use of deep learning. • Expertise in the application of machine learning to metabolic engineering, enabling the optimisation of microbial cell factories.
Experience	• Evidence of publications in any of the essential or preferable listed subjects.	• Post-doctoral research experience. • Experience of working in a multidisciplinary team. • Experience of collaboration within research projects dealing with omics data processing. • Experience of developing new approaches, models, techniques or methods in research area.
Personal Attributes	• Commitment to delivering the aims of the project to develop and apply transferable machine learning strategies and automated workflows, informing metabolic engineering strategies.	

	• Ability to work to deadlines and prioritise tasks. • Highly motivated, able to work independently, as well as highly effectively in interdisciplinary teams. • Excellent written and oral communication and presentation skills in English.	
Statutory/Legal	• Satisfactory Basic disclosure obtained from the Disclosure and Barring Service.	

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