ROLE PROFILE

Job Title: Research Associate/Fellow White Biotechnology [Green Chemicals Beacon]

School/Department: Department of Chemical and Environmental Engineering, Faculty of Engineering

Job Family and Level: Research & Teaching Level 4 CTG/Level 4

Contract Status: Fixed term - 36 months

Hours of Work: Full time; 36.25 per week

Location: University Park, Coates building

Reporting to: Samantha Bryan

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 metabolic engineering and molecular biology.

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 White Biotechnology will strengthen collaborations across the University, international academics and industry.
Job Outline:

The White Biotech component of the Nottingham Green Chemicals Beacon of Excellence will develop chasses for aromatic, aldehyde and terpenoid production; focusing on the implementation of attenuation strategies and novel tools to improve carbon flux in cyanobacteria, *E. coli* and *Cupriavidus* sp.

We are seeking two talented and highly motivated PDRA's. You will join an exciting programme of work focused on engineering chasses to generate high value products. You will utilise advanced synthetic biology techniques and metabolic engineering to reprogram these microorganisms to transform materials at a cellular level. This is a multidisciplinary project integrating world-leading expertise in metabolic engineering, process development and sustainable chemistry. This is an exciting opportunity to shape and create a cutting-edge biotechnology platform, which will provide cost-effective and sustainable processes for the chemical industry. We also welcome applicants with industrial experience.

The role holder will have the opportunity to work with Industrial partners and use their initiative and creativity to identify areas for research, develop research methods and extend their research portfolio.

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<th>Main Responsibilities</th>
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<td>1. To plan and conduct research using recognised approaches, methodologies and techniques within molecular biology and synthetic biology to further the aims of the research project.</td>
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<td>2. To analyse and illuminate data, interpret reports, evaluate and criticise texts and bring new insights to research area.</td>
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<td>3. To contribute to writing up research findings for publication in leading journals.</td>
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<td>4. To contribute to the preparation of internal and external written reports and presentations to the sponsors.</td>
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<td>5. To build internal and/or external contacts to develop knowledge and understanding, forming relationships for future collaborations.</td>
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<td>6. To provide guidance as required to support staff and students, where appropriate in own area of expertise.</td>
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<td>7. To collaborate with academic colleagues on areas of shared interest for example, course development, collaborative or joint research projects.</td>
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<td>8. To plan and manage own research activity and resolve problems, if required, in meeting own/team research objectives and deadlines in collaboration with others.</td>
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<td>9. To utilise and contribute to organising research resources and facilities, laboratories and workshops as appropriate.</td>
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<td>10. To play an active role in outreach activities designed to promote public engagement in the science being undertaken within the Faculty of Engineering.</td>
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<td>11. Where appropriate, to contribute to teaching, for example through laboratory demonstrations, lectures to postgraduate workshops.</td>
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Knowledge, Skills, Qualifications & Experience

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<th>Qualifications/ Education</th>
<th>Essential</th>
<th>Desirable</th>
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<td>PhD or equivalent (or about to obtain) in a discipline relevant to Synthetic Biology.</td>
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Skills/Training

- Excellent oral and written communication skills, including the ability to communicate with clarity on complex information.
- Evidence of sufficient breadth or depth of microbial molecular biology research methodologies and techniques.
- Developing research skills, with the ability to creatively apply relevant research approaches, models, techniques and methods.
- Ability to contribute to method improvement.
- Analytical ability to facilitate conceptual thinking, innovation and creativity.
- Ability to build relationships and collaborate with others, internally and externally.
- Knowledge of key concepts of:
  - biochemical networks (biochemistry) and gene regulation
  - genetic modification
  - systems biology
  - enzymology
  - responsible research innovation (RRI)
  - microbial fermentation
- Ability to assess and organise resource requirements and deploy effectively.
- Ability to foster a research culture and commitment to learn in others.
- High analytical ability to analyse and illuminate data, interpret reports, evaluate and criticise texts and bring new insights.
| Experience | Practical experience in aspects of Synthetic Biology/metabolic engineering.  
|           | Track record in academic publication  
|           | Supervising or helping with the supervision of research students  
|           | Experience of handling cyanobacteria, E. coli and Cupriavidus sp. |

| Research experience in the modification/exploitation of a microbial process or attribute  
| Ability to develop and apply new concepts and methods  
| Working in a similar research environment |

Due to the requirements of the UK Border and Immigration Agency, applicants who are not UK or EEA nationals and whose immigration status entitles them to work without restriction in the UK will be considered on an equal basis with UK and EEA nationals. Other non-UK or non-EEA nationals whose employment will require permission to work subject to a resident labour market test may only be considered if there are no suitable UK or EEA national candidates for the post. Please visit http://www.ukba.homeoffice.gov.uk/ for more information.