UNIVERSITY OF LEEDS

CANDIDATE BRIEF

Research Fellow in Fermentation Processes and Bioeconomies, Faculty of Engineering and Physical Sciences

Salary: Grade 7 (£41,064 - £48,822 p.a.)

Reporting to: Professor John Blacker

Reference: EPSPE1126

Closing date: Thursday 23 April 2026

Fixed term (12 months - to complete specific time limited work)

Location: Leeds main campus

We are open to discussing flexible working arrangements

Research Fellow in Fermentation Processes and Bioeconomies,
School of Chemical and Process Engineering.

Do you have a strong interest in fermentation? Do you have experience in process design and life cycle assessments? Are you keen to develop your career in bioeconomies? Do you want to further your career in one of the UK's leading research-intensive Universities?

Overview of the Role

Achieving economically viable, sustainable and net-zero production routes for biogenically derived chemicals remains one of the fundamental challenges facing the global bioeconomy. Converting bio-waste streams, including food, paper, and agricultural residues into high-value products, offers a transformative opportunity: these waste materials are low-cost, widely available, and currently underutilised. Recent advances have demonstrated that such wastes can be efficiently processed to yield high concentrations of fermentable sugars, unlocking new pathways for producing bioplastics, platform chemicals, and next-generation bio-manufactured materials.

This project will create the first integrated digital twin of an intensified bio–waste–to–sugars conversion process, enabling industry and policymakers to understand how the process system performs technically, economically and environmentally at scale. As the Research Fellow, you will develop process models which will support the wider optimisation frameworks and system-level sustainability assessments to:

- Map and evaluate material, energy and resource supply chains.
- Integrate novel manufacturing and separation technologies into an intensified process flowsheet.
- Design multi-criteria decision-support tools capturing cost, carbon, land-use, circularity and resilience metrics.
- Quantify and manage uncertainties in supply, quality, and logistics of bio-waste feedstocks.
- Identify the most economically competitive and environmentally robust deployment scenarios for UK and international markets.

The outcomes of this work will directly support the scale-up of circular, bio-based manufacturing technologies, offering evidence-backed strategies for cost reduction, process intensification, and sustainable market entry.

This project is part of a UKRI-BBSRC-funded programme based at the University of Leeds, working closely with collaborators at the Universities of Manchester and Warwick. The project sits within the Global Challenge Centre for Innovative Recycling and Circular Economy (CIRCLE), engaging an international consortium of academic and industrial partners across the USA, Canada, Korea and Australia (www.jcvi.org/research/circle). The successful applicant will join a growing community working at the interface of biotechnology, process systems engineering, circular economy innovation, and global sustainability.

Main duties and responsibilities

- Apply a self-led approach to developing a process flowsheet for the Biowaste to Sugar Process;
- Understanding, characterising and processing of biomass/biowaste streams;
- Perform life cycle assessments to determine the environmental impacts of the process;
- Understanding and carrying out fermentation/saccharification experiments;
- Develop research objectives and proposals, collaborating with the CIRCLE Team to set the direction of research activities and the project, while effectively communicating results through organised reports, journal publications and meeting presentations;
- Evaluating methods and techniques used and results obtained by other researchers and relating such evaluations appropriately to your own research;
- Working independently and as part of a larger team of researchers, both internally and externally, to develop new research links and collaborations and engage in knowledge transfer activities where appropriate;
- Contributing to the training of both undergraduate and postgraduate students, including assisting with the supervision of projects in areas relevant to the project.

These duties provide a framework for the role and should not be regarded as a definitive list. Other reasonable duties may be required consistent with the grade of the post.

Qualifications and skills

Essential

- A PhD (or have submitted your thesis before taking up the role) in Chemical Engineering;
- Experience in Life Cycle Assessments and using the SimaPRO software platform;
- Experience in fermentation processes and process flowsheeting;
- Experience in biochemical characterisation and thermochemical processing of biomass/biowastes;
- Experience with mechanistic modelling of biomass supply chains and their end-of-life;
- Good time management and planning skills, with the ability to meet tight deadlines and manage competing demands effectively without close support;
- Excellent communication skills, both written and verbal, and the ability to communicate your research at national and international conferences;
- A proven ability to work well both individually and in a team;
- A strong commitment to your own continuous professional development.

Desirable

- Experience of pursuing external funding to support research;
- A developing track record of peer-reviewed publications in international journals;
- Experience in techno-economic and sensitivity analyses;
- A strong MSc in Energy and Environment.

How to apply

You can apply for this role online; more guidance can be found on our How to Apply information page. Applications should be submitted by **23:59** (UK time) on the advertised closing date.

Contact information

To explore the post further or for any queries you may have, please contact:

Professor John Blacker, Professor
Email: J.Blacker@leeds.ac.uk

Additional information

Faculty and School Information
Further information is available on the research and teaching activities of the Faculty of Engineering & Physical Sciences, and the School of Chemical and Process Engineering.

Working at Leeds
We are a campus-based community and regular interaction with campus is an expectation of all roles in line with academic and service needs and the requirements of the role. We are also open to discussing flexible working arrangements. To find out more about the benefits of working at the University and what it is like to live and work in the Leeds area visit our Working at Leeds information page.

A diverse workforce
As an international research-intensive university, we welcome students and staff from all walks of life and from across the world. We foster an inclusive environment where all can flourish and prosper, and we are proud of our strong commitment to student education. Within the Faculty of Engineering and Physical Sciences we are dedicated to diversifying our community and we welcome the unique contributions that individuals can bring, and particularly encourage applications from, but not limited to Black, Asian and ethnically diverse people; people who identify as LGBT+; and people with disabilities. Candidates will always be selected based on merit and ability.

The Faculty of Engineering and Physical Sciences are proud to have been awarded the Athena SWAN Silver Award from the Equality Challenge Unit, the national body that promotes equality in the higher education sector. Our equality and inclusion webpage provides more information.

Information for disabled candidates
Information for disabled candidates, impairments or health conditions, including requesting alternative formats, can be found under the 'Accessibility' heading on our How to Apply information page or by getting in touch by emailing HR via hr@leeds.ac.uk.

Criminal Record Information
Rehabilitation of Offenders Act 1974
A criminal record check is not required for this position. However, all applicants will be required to declare if they have any 'unspent' criminal offences, including those pending.

Any offer of appointment will be in accordance with our Criminal Records policy. You can find out more about required checks and declarations in our Criminal Records information page.

Salary Requirements of the Skilled Worker Visa Route
Please note that this post may be suitable for sponsorship under the Skilled Worker visa route but first-time applicants might need to qualify for salary concessions. For more information, please visit the Government's Skilled Worker visa page.

For research and academic posts, we will consider eligibility under the Global Talent visa. For more information, please visit the Government's page, Apply for the Global Talent visa.