Job title	Research Associate/Fellow	Job family and level	Research and Teaching Level 4
School/ Department	School of Life Sciences	Location	Nottingham Engineering Biology Labs (NEBL), BioDiscovery Institute (BDI), University of Nottingham

Purpose of role

The purpose of this role is to undertake the research and achieve the objectives of a research project of the Carbon-Loop Sustainable Biomanufacturing Hub (C-Loop). C-Loop is an ambitious, pioneering new hub developing processes using engineering biology and microorganisms to transform industrial wastes into valuable, sustainable chemicals and materials - making a substantial positive impact towards a sustainable net-zero future.

This post is based in the Nottingham Engineering Biology Labs (NEBL) research cluster at the University of Nottingham and involves collaboration with our academic and industrial partners in the C-Loop consortium.

The person appointed will work closely with, and under the direction of, Prof John Heap. They will plan and conduct work using approaches, methodologies and techniques appropriate to the type of research, including both applying knowledge and approaches already established in the research group/cluster, as well as building on these with new developments for this project. They will be responsible for preparing outputs including writing and revising manuscripts for journal publication, preparing oral and poster presentations, and other types of outputs such as patent applications.

The person appointed will have the opportunity to use their initiative and creativity to identify areas for research, develop research methods and extend their research portfolio.

	Main responsibilities (Primary accountabilities and responsibilities expected to fulfil the role)	**% time per year**
1	To plan and conduct research using suitable approaches, methodologies and techniques within the research area - particularly towards the development of biocatalytic microbial strains, cultures/cocultures, and enzymes for 'bio-upcycling': using suitable waste feedstocks/substrates, especially fermentation wastes including C1 substrates, and transforming them into useful products. The work will involve C1-consuming microorganisms including photoautotrophs. The research is expected to include: ▪ Developing a microbial waste-to-products platform / process from initial proof of concept to a mature stage ready for industrial technology transfer and scale up ▪ Identification and investigation/characterisation of candidate microorganisms, products, genes, enzymes and conditions to explore for inclusion in the waste-to-products process	70

	▪ Design of coding sequences including variants and other genetic parts/elements as necessary to allow construction of genetic clusters/libraries for assimilation of feedstocks, redirection of metabolic fluxes, and biosynthesis of target products ▪ Literature, database and bioinformatics approaches to inform design ▪ Application of genetic tools and engineering biology/synthetic biology technologies including DNA assembly of constructs and combinatorial libraries ▪ Construction of engineered microorganisms, including transfer of DNA constructs/libraries into cells ▪ Characterisation of relevant properties of multiple iterations of a microbial waste-to-products process, including: o Growth characteristics and dynamics in cultures and cocultures o Production of target products o Enzymatic assays o Performance of other designed features o Using analytical methods (e.g. LC/GC/NMR/FID/MS) to detect and quantify feedstock consumption and product formation ▪ Development of process conditions ▪ Refinement of designs in light of observed results and iterative cycles of strain development ▪ Exploring and developing new directions and branches to the initial project ▪ Working in close coordination with others and using our established frameworks where applicable for all of the above	
2	Research existing literature and monitor publication of new literature to develop and maintain a very good understanding of relevant research and its wider context. This is needed as a firm basis for conducting the research project and developing outputs from the research including publications. Share learnings and develop ongoing discussion with the PI, other research group/cluster members, and collaborators, using digital platforms used by the group/cluster, discussions, and through research progress and 'journal club' style presentations at research group/cluster meetings.	5
3	Report experimental results to the PI, other group/cluster members, academic collaborators and industrial partner(s) on time and in the form requested, through written reports, oral presentations, and discussions. Participate in collaborative meetings and research with other members of the team. Maintain accurate and complete records of all findings, including keeping excellent written, electronic and biological records in line with the group/cluster's working practices.	5
4	Work with the PI to review, develop and potentially revise the project aim and objectives in light of learnings from experimental results, scientific literature, and developments by collaborators and elsewhere.	2.5
5	Work with the PI on dissemination and achieve successful research outputs by: ▪ Preparing and revising manuscripts for publication of the research	5

	▪ Contributing to dissemination at national and/or international conferences, as suitable opportunities are identified and agreed with the PI ▪ Complying strictly and carefully with the group/cluster working practices on disclosure, confidentiality, IP and commercial sensitivity as directed by the PI ▪ As necessary, working with the PI, academic and/or industrial partner(s), IP lawyers/attorneys and university technology transfer and commercialisation specialists	
6	As requested by the PI, engage in a professional and constructive manner with industrial partners, and staff and students of other collaborators and partners as necessary.	2.5
7	All group/cluster members including this role holder are expected to contribute positively to the research group/cluster and to foster a positive, supportive, inclusive and respectful culture and environment. This includes providing support, guidance and supervision to other staff and students, especially more junior group/cluster members, and supporting some aspects of general day-to-day activities to ensure a smooth running of the group/cluster and its laboratories. All group/cluster members including this role holder must contribute to keeping our workplace safe and healthy.	5
8	Assist in writing proposals for further research funding.	5

Person specification

	Essential	**Desirable**
Skills	▪ Microbiology expertise ▪ Molecular biology expertise including molecular cloning / DNA assembly ▪ Excellent oral and written communication skills ▪ Excellent analytical and critical skills ▪ Ability to organise and keep track of complex projects ▪ Ability to build relationships and collaborate with others	▪ Expertise in microbial photoautotophs: cyanobacteria and/or microalgae ▪ Microbial metabolic engineering expertise ▪ Expertise in developing microbial cultures / cocultures / fermentation ▪ Familiarity with using bioinformatics approaches in biotechnology ▪ Ability to foster a research culture and commitment to learn in others
Knowledge and experience	▪ Appropriate microbiology experience ▪ Appropriate molecular biology experience including molecular cloning / DNA assembly	▪ Experience with construction and use of genetic libraries in microorganisms ▪ Experience with multiple different microorganisms ▪ Experience using bioinformatics approaches in biotechnology ▪ Experience of scientific collaboration

Qualifications, certification and training (relevant to role)	▪ PhD or equivalent in Engineering Biology, Synthetic Biology, Metabolic Engineering, Microbiology, Molecular Biology, Biocatalysis or other closely related relevant subject area or the equivalent in professional qualifications and experience in research area. OR ▪ Very near to completion of a PhD	▪ BSc or Masters degree in Microbiology, Molecular Biology, Biochemistry, or closely related field.
Statutory, legal or special requirements		

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 friendly, engaging and receptive, putting others at ease. Actively listens to others and goes out of way to ensure people feel valued, developed and supported.
Taking ownership	Is clear on what needs to be done encouraging others to take ownership. Takes action when required, being mindful of important aspects such as Health & Safety, Equality, Diversity & Inclusion, and other considerations.
Forward thinking	Drives the development, sharing and implementation of new ideas and improvements to support strategic objectives. Engages others in the improvement process.
Professional pride	Is professional in approach and style, setting an example to others; strives to demonstrate excellence through development of self, others and effective working practices.
Always inclusive	Builds effective working relationships, recognising and including the contribution of others; promotes inclusion and inclusive practices within own work area.

Key relationships with others