



Researcher: Sustainable development and exploitation of green biorefinery feedstocks and products (Rural BioReFarmeries project)

University College/ Management Unit	Munster Technological University
University School/ Unit	CircBio Research Group
Project Title	Rural BioReFarmeries
Post Duration	18 months
Supervisors/ Mentors	James Gaffey & Helena McMahon
Project Partners (if applicable)	Collaborative EU project – many industry/academic partners https://www.cbe.europa.eu/projects/rural-biorefarmeries
Main Location for project	MTU Kerry and Farm Zero C
Funding source	Circular Bio-based Europe Joint Undertaking
Provisional start date	1 st December 2024
BiOrbic Challenge alignment	Climate Neutral Animal Agriculture
Salary	€42,633 per annum

Summary

The Circular Bioeconomy is a thematic area of research at Munster Technological University in Ireland, led by the Circular Bioeconomy Research Group (CircBio) based at the Shannon Applied Biotechnology Centre. This multi-disciplinary team leads and participates on a range of exciting, high impact, national and international research projects including Rural BioReFarmeries, Farm Zero C, Biorefinery Glas, INFORMBIO, BIOSWITCH, BBioNets, BIO4AFRICA, COOPID, MainstreramBIO ROBIN, BioAssess and many more. Research activities of CircBio focus upon improving the value and circularity of raw materials and waste, sustainable product development, analyzing, monitoring the impact of sustainable technologies and practices, and engaging with primary producers, industry, government and relevant stakeholders to ensure research impact is maximized with real-world impact. The group plays a leading role in the development of bio-based technologies for processing feedstocks from grasses to seaweeds, for the development of sustainable bio-based materials. The successful candidate will work on some of the group's exciting international projects in this domain. This position will suit candidates with previous experience of bioeconomy-related domains such as biorefining, bioenergy and nutrient recycling.

Munster Technological University, through CircBio will lead a new first-of-its-kind decentralised green biorefinery demonstration initiative funded under the Circular Bio-based Europe Joint Undertaking (CBE JU). "Rural BioReFarmeries" project will advance the development of farm-centred bioeconomy approaches through the deployment of green biorefineries across grassland regions of Europe. Two primary green biorefinery and anaerobic digestion demonstration sites in Ireland and Denmark will optimise the conversion of grasses, clover and green biomass residues sourced from local farms into value-added products such as human and animal grade protein, bio-based food packaging, flavours, anti-microbials, fertiliser and energy, in collaboration with upstream research and industrial sites in Netherlands, Ireland, Denmark and Poland.



Description of Work

This position of “Researcher: Sustainable development and exploitation of green biorefinery feedstocks and products” will help to oversee and implement the research activity at the project’s Irish biorefinery and anaerobic digestion demo site at Farm Zero C, Cork Ireland. The researcher will work closely with the MTU project team, based at Kerry (Tralee) and Cork. In the addition the researcher will collaborate closely with Irish and EU downstream partners (who will further analyse projects), industry (product end-users) and the green biorefinery demonstration plant of Aarhus University, Viborg, home to the Danish demo site.

Tasks and Responsibilities include

- Conduct a desk-based review of potential feedstock and product opportunities from green biorefineries
- Co-develop a standardized method for collection, comparison and analysis of green biorefinery feedstock and process data
- Liaise closely with the biorefinery team of sister green biorefinery demo site at Aarhus University, Viborg to collect and compare data, along with the wider Rural BioReFarmeries project team
- Characterise feedstocks of interest for green biorefinery processing to determine their suitability, considering key parameters like DM, sward length, crude protein (CP), carbohydrate, lignin and ash content
- Analyse green biorefinery processing co-products at bench and later demo scale considering key parameters for upstream use
- Investigate feedstock and co-product stability and preservation under different circumstances
- Support the Rural BioReFarmeries team in efforts to scale activities from lab/pilot to demonstration scale settings, including the supporting the technical and logistical aspects of the farm-scale demo plant
- Work with additional MTU and Rural BioReFarmeries partners on the efficient analysis, management and distribution of product samples
- Conduct an assessment of regulatory requirements impacting Rural BioReFarmeries products market access – with input from project colleagues
- Contribute to biorefinery analysis activities such as LCA, TEA and business model analysis with colleagues
- Management and mitigation of project risks related to sample analysis and distribution
- Participate in, contribute to and co-organize project related external events such as demonstration days, workshops, training and promotional events, as well as internal project meetings
- Contribute to broader project dissemination activities
- Support in delivery of designated project management and reporting activities in collaboration with co-ordinator and broader MTU Rural BioReFarmeries team
- Writing technical reports and peer-reviewed publications



- Mentoring of PhD students involved in tasks related to the green biorefinery and Rural BioReFarmeries projects
- Contributing to the broader activities of CircBio and Rural BioReFarmeries

Candidates must demonstrate the following

- ✓ PhD or MSc in a related area (e.g., biology, biochemistry, biotechnology, food technology, biorefinery product feedstock or project analysis)
- ✓ Relevant technical background with experience in characterisation and analysis of biomass-related feedstocks or products
- ✓ Relevant training and experience in process analytics related to key parameters in biomass/biobased product characterisation (e.g., mass, DM, ash, elemental analysis, protein and carbohydrate analysis)
- ✓ Familiar with extraction technologies of bioresources
- ✓ Experience of biomass-related sample preparation, scheduling and management
- ✓ Experience in capturing, comparing and analysing data related to biomass-related samples
- ✓ Experience in working as part of a multi-disciplinary team
- ✓ Genuine enthusiasm about working on an innovative bioeconomy project in a farm-based environment
- ✓ Strong leadership capability
- ✓ Excellent track record of delivering technical reports and/or publications
- ✓ Self-motivated and strong ability to work on own initiative will be essential to the role
- ✓ Ability to follow instruction of project PIs and collaborate with other team members is also a requirement
- ✓ Excellent interpersonal, communication, presentation and organizational skills
- ✓ A full driver's license is required in order to access the farm and other relevant sites

The following is desirable

- ✓ Knowledge and experience of biorefinery process systems and extraction of products (e.g., proteins/sugars) from biomass
- ✓ Any experience of grassland or other green biomass feedstocks (legumes, green crop wastes) suitable for green biorefinery
- ✓ Previous experience of research in a demonstration of farm-related environment
- ✓ Strong technical background, including track record of publishing related research is highly desirable
- ✓ Experience of project management, and demonstrable ability to plan and implement tasks in a timely manner

Salary

€42,633 per annum. The post is of 18 months duration and may be extended.



Application Procedure

All applications to be made online at www.mtu.ie/vacancies

For informal queries contact James.gaffey@mtu.ie or Helena.mcmahon@mtu.ie

Location

This post is based within the Circular Bioeconomy Research Group (CircBio) at Munster Technological University in Tralee however, travel to the demonstration facility at Farm Zero C at Shinagh Estates Farm in Bandon, Co. Cork will be required at various points for research, supervision and meeting purposes. Occasional national and international visits will be essential for training and to collaborate with project partners and funders

Funding

This project has received funding from the European Union's Circular Bio-Based Europe Joint Undertaking under Grant Agreement No. 101156954.

Closing date for applications is 1.00pm Tuesday, 15th October 2024

Applications received after the closing date will not be accepted.

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