

## PhD Opportunity

PhD Opportunity – Precision Fermentation, Metabolic Engineering and Synthetic biology  
Location: Palmerston North, New Zealand

### Project Title

*New Zealand precision fermentation: from local bioresources to high value proteins*

### Project Overview

Precision fermentation offers a sustainable pathway to produce high-value proteins at scale. We are considering producing a mammalian glycoprotein that has significant applications across food, nutraceutical, and pharmaceutical industries. The mammalian protein has unique antimicrobial, anti-inflammatory, and immunomodulatory properties.

This PhD project will focus on developing and optimising a precision fermentation process to produce a novel protein variant using yeasts grown on hydrolysed sugars derived from forest residue biomass. A key aspect of the research will be the development and optimisation of an enzyme immobilisation platform to enable efficient and reusable enzymatic hydrolysis of forest residue biomass for sugar production. Building on recent successes, including the establishment of small-scale fed-batch fermentations and advanced proteomic analyses, the student will systematically design, test, and integrate genetic elements to enhance the expression and secretion efficiency of complex mammalian proteins.

Application of Adaptive Laboratory Evolution (ALE) will be used to improve host strain performance. The researcher will design and run ALE campaigns to enhance traits such as secretion efficiency, stress tolerance, and overall productivity, integrating evolutionary approaches with rational strain engineering.

The project will also compare protein variants to determine which offers superior expression and functionality in yeast system. Insights from this work will contribute to advancing sustainable alternative food technologies, supporting the objectives of the Centre of Research Excellence research programme.

The PhD will be hosted at the Riddet Institute, Massey University, in Palmerston North, New Zealand, and supported by The New Zealand Institute for Bioeconomy Science. This provides successful candidates with access to facilities and interdisciplinary expertise across institutions.

Collaboration is a cornerstone of this project, offering the candidate the chance to work closely with experts in strain engineering, bioinformatics, systems biology and fermentation. The PhD candidate will join a collaborative team led by Prof. Munish Puri (Riddet and Bioeconomy Science Institute), Dr David Hooks and Dr Alankar Vaidya (Bioeconomy Science Institute) and Dr Rajesh Sathyamoorthy (Riddet Institute). The research will be primarily conducted within the bioprocessing lab at Riddet Institute and Bioeconomy Science Institute, both internationally recognized for their innovations in fermentation and metabolic engineering. Opportunities for conference attendance, professional development, and national/international collaboration are integral to the program.

### Key Objectives

- Develop an enzyme Immobilisation platform for biomass hydrolysis
- Optimise production of hydrolysed sugars from forest residues
- Evaluate and compare the expression and secretion efficiency of mammalian variants.
- Optimise fermentation processes to achieve high yield and quality.

### Scholarship Details

The 3.5-year scholarship includes:

- An annual, tax-free stipend of NZD\$35,000.
- Tuition fees.

#### Host Institutions

- Riddet Institute ([www.riddet.ac.nz](http://www.riddet.ac.nz))
- Bioeconomy Science Institute ([www.bioeconomyscience.co.nz](http://www.bioeconomyscience.co.nz))
- Massey University ([www.massey.ac.nz](http://www.massey.ac.nz))

The student will be enrolled through the College of Science at Massey University, New Zealand.

#### Candidate Requirements:

- A First-Class Honours or Second-Class Honours (Division I) MSc degree (or equivalent) or BSc degree with Honours (or equivalent) in biotechnology, microbiology, molecular biology, biochemistry, or closely related field.
- Prior experience of working with enzyme immobilisation techniques such as adsorption, or covalent attachment, or cross-linking would be preferred
- Prior experience with molecular cloning, fermentation, and/or recombinant protein production is highly desirable. Skills in metabolic engineering and synthetic biology would be preferable
- Motivation and self-determination to complete a PhD within 3.5 years.
- Excellent written and oral communication skills. International students may be required to demonstrate English language proficiency, as per the English language entry requirements found [here](#).
- Ability to learn, work independently and collaboratively, adapt to change, and plan, organise, and implement projects in a timely manner.
- Ability to work effectively in a diverse, multidisciplinary team.

Start Date: Preferably by November 2026.

#### How to Apply:

Please send your (1) Cover letter, (2) CV, (3) Academic transcript, (4) A brief statement of research interests, and (5) The contact details of two referees to the Riddet Institute at [info@riddet.ac.nz](mailto:info@riddet.ac.nz), clearly stating Reference MP2026 in the e-mail subject line. Applications close on Tuesday, 15 September 2026. Applications will be reviewed as they are received.

Information about doctoral enrolment and study at Massey University can be found [here](#).

For further information, contact: Professor Munish Puri, email: [m.puri@massey.ac.nz](mailto:m.puri@massey.ac.nz). NOTE: Applications sent directly to Professor Munish Puri will not be accepted. Send applications to: [info@riddet.ac.nz](mailto:info@riddet.ac.nz), including the reference: MP2026, in the email subject line.