

SUMMER RESEARCH 2024/25

PROJECT ABSTRACT



THE UNIVERSITY OF
WAIKATO
Tē Whare Wānanga o Waikato

PROJECT # 48

SUPERVISOR/S:	Dr Joanna Hicks & Adele Williamson
PROJECT TITLE:	Some like it hot: Exploring thermophilic RNA ligases for biotechnology applications
FIELD:	Biochemistry/Molecular Biology
DIVISION/SCHOOL:	HECS - Te Huataki Waiora School of Health
PROJECT LOCATION:	Hamilton

PROJECT ABSTRACT:

RNA ligases are enzymes capable of joining RNA strands and are extremely useful in biotechnology applications such as microRNA sequencing. However, biases exist in this ligation process due to the current enzymes working at low temperatures. Thermophilic RNA ligases are an attractive alternative for high temperature ligation but display varying activity. This project will build on previous work to characterise and optimise the activity of two thermophilic RNA ligase enzymes including their substrate preferences and temperature optima.

STUDENT SKILLS:

- Pipetting and general lab skills
- SDS-PAGE analysis of proteins
- General biochemistry laboratory skills
- Skills in the purification and characterisation of proteins (not essential)

PROJECT TASKS:

1. Express and purify recombinant RNA ligases using existing methods
2. Test the activity of thermophilic RNA ligases
3. Create a research poster for the project

EXPECTED OUTCOMES:

- Student's Research Poster (as per clause 6 of the [Scholarship regulations](#))
- Pure RNA ligase enzymes obtained
- A better understanding of the substrate preferences for two thermophilic RNA ligases and their temperature optima

