

SUMMER RESEARCH 2024/25

PROJECT ABSTRACT



THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

PROJECT # 50

SUPERVISOR/S:	Dr Megan Grainger
PROJECT TITLE:	Investigation of the effect of heavy metals on bee larvae
FIELD:	Metals/Chemistry
DIVISION/SCHOOL:	HECS - Te Aka Mātuatua School of Science
PROJECT LOCATION:	Hamilton

PROJECT ABSTRACT:

Honeybees are exposed to many contaminants during their life. These may come from nectar and pollen used as food sources or may be in particles from the atmosphere. Heavy metals are toxic and it is currently unknown the extent of chronic exposure of metals on honeybees during development and adulthood.

This project will assist with in-lab honeybee trials which is spin off project from a current project analysing the effect of heavy metals on adult bees. Honeybee larvae will be grafted into dishes and feed metals during their larval stage before analysing the emerging adult bee. Head, abdomen and thorax from the bee will be analysed to determine the areas of accumulation of metals. Individual brains may also be analysed. Due to the very small mass of sample, a new analysis method to quantify the metal concentration in the brain needs to be validated for accuracy.

As part of this project, the student will need to be comfortable being around live bees as they will need to go into hives to collect samples and also handle bees in the laboratory.

STUDENT SKILLS:

- Careful laboratory skills and ability to work independently
- Patience and a steady hand
- Attention to detail with data recording
- Capable using Excel
- Ability to follow instructions
- Quick to learn new methods
- Interest in bees and no allergy to stings
- Willing to go into hives to collect samples

PROJECT TASKS:

1. Validate a low flow method for ICP-MS
2. Dose grafted honeybee larvae with metals (separate trials)
3. Process larvae at the end of the trial for heavy metal analysis and RNA analysis
4. Work with PhD student to complete tasks
5. Help generate data that will lead to publication
6. Potential: Learn to dissect brain from bee head capsule
7. Potential field work: Assist in field collections and processing of samples

EXPECTED OUTCOMES:

- Student's Research Poster (as per clause 6 of the [Scholarship regulations](#))
- Method validated for analysis of samples with low volumes via ICP-MS
- Completed larvae trials with three heavy metals
- Samples prepared for RNA analysis

