This funded three-year PhD scholarship opportunity will be based at the School of Science, University of Waikato, Hamilton, New Zealand. This research is part of a Marsden Fund Fast-Start project. The successful candidate will have prior experience in laser ablation ICP-MS, live bee studies and/or RNA sequencing and data analysis. We anticipate that this research will lead to exciting results and high impact publications.

BACKGROUND: Honeybee health and populations are declining worldwide due to multiple stressors. Honeybees are intimately involved with their environment during foraging flights, making the foragers – and consequently the colony – susceptible to exposure to pollutants. While there is a large focus on pollutants such as pesticides, the influence of inorganic elements is currently an understudied area. Unlike pesticides, inorganic elements (such as cadmium and lead) do not break down. The continued exposure to these metals may have an implication for bee colonies.

PROJECT: This project aims to determine if long-term exposure to metals has an effect on bee colonies. By assessing the impact of metals at three organisational levels (cellular, individual bee and colony), we aim to determine the relationship between metal accumulation in the bee brain with alteration in gene transcription and subsequently colony health and function.

Fundamental aspects of this project will include carrying out laboratory based and colony bee studies, analysing the uptake of metals into the bee and relating this to changes in gene expression and health of the hive.

The project will involve regular sample collection (e.g. bees, larvae, honey) from hive sites over the three-year period and monitoring a number of health indicators (e.g. mite count, larvae weight). The student will prepare samples for a range of techniques including ICP-MS, LA-ICP-MS and transcriptome analysis, as well as being involved in analysis of samples and data interpretation. They will also be responsible for cell culture work and subsequent experiments.

The student should be comfortable working with large datasets and have sound knowledge in statistical analysis.

This research will make a significant contribution to understanding the influence that metal exposure has on bees at the cellular, individual bee and colony levels.

Eligibility criteria:

1) a master’s degree in a relevant discipline (e.g., analytical chemistry, biochemistry);
2) demonstrated experience in analytical laboratory work and working with large datasets;
3) previous experience with at least one of the following: laser ablation ICP-MS, live bee studies (lab-based or colony) and/or RNA sequencing and data analysis
4) excellent written skills evidence by scientific journal papers, conference papers or technical reports
5) a willingness to work with bees and not have an allergic reaction to them
6) excellent interpersonal and communication (oral and written) skills
7) demonstrated English language skills (if English is not your first language, TOEFL or IELTS scores should be submitted with your application if available).

Knowledge on keeping bees is desirable but not essential

This PhD studentship is funded for 3 years and consists of a $27,500 stipend per annum plus domestic fees. This position is for full-time study. Domestic or International students are welcome to apply.

Ideally, this project will commence between 1 June and 1 December, but a later start date may be possible if mutually agreed.

**Application documents required:**
- Cover letter describing how applicant meets requirements of this position and their motivation and interest related to the research project, plus any other information that is deemed relevant
- CV
- Academic transcript and TOEFL/IELTS scores
- References from at least two academic referees, and one character or industry referee and their contact details

**Contact and email address for applications:**

Applications are to be submitted to megan.grainger@waikato.ac.nz, with the subject line: “PhD Application: Metals in Bees”.

Incomplete applications will not be considered.
Review of applications will begin on 29 March 2021 and continue until the position is filled. Final acceptance is subject to the approval of the University of Waikato postgraduate studies office.

For any further information, please contact Dr Megan Grainger, megan.grainger@waikato.ac.nz

**Closing date:**
Ongoing review of applications from 30 June 2021