

# SUMMER RESEARCH 2024/25

## PROJECT ABSTRACT



THE UNIVERSITY OF  
**WAIKATO**  
*Te Whare Wānanga o Waikato*

### PROJECT # 52

<b>SUPERVISOR/S:</b>	Associate Professor Charles Lee
<b>PROJECT TITLE:</b>	Do post-surgical antibiotics assist the recovery of chronic rhinosinusitis patients?
<b>FIELD:</b>	Clinical Microbiology
<b>DIVISION/SCHOOL:</b>	HECS - Te Aka Mātuatua School of Science
<b>PROJECT LOCATION:</b>	Hamilton
<b>EXTERNAL PARTNER:</b>	University of Auckland

#### PROJECT ABSTRACT:

Since their use commenced, it has been evident that antibiotics can cause patients to experience side effects. In recent decades, the effect of antibiotic use on antibiotic resistance has been recognised as one of the leading threats to human health. What has only become apparent over recent years is that antibiotic use can also have a marked effect on overall health due to its prolonged deleterious effects on the human microbiome. Chronic rhinosinusitis (CRS) is one of the most prevalent chronic diseases in the Western world and is commonly treated with elective endoscopic sinus surgery (ESS). Currently, an overwhelming majority of ENT (ear, nose, and throat) surgeons recommend a course of oral antibiotics after ESS despite a paucity of evidence to support this practice.

Based on our published pilot study examining the use of oral prophylactic antibiotics after ESS, which suggested that the placebo had more favourable effects on patient recovery than oral antibiotics, we are conducting a multi-centre, double-blind, randomised study that includes four surgeons from across the North Island. This study aims to definitively test the hypothesis that routine prophylactic use of oral antibiotics after ESS results in a worse clinical outcome.

We seek a highly motivated student with a background in molecular and cellular biology (experience in microbiology is preferred but not required) to analyse human microbiome samples to enable an assessment of the microbiome as an endpoint. Depending on the student's experience and preference, the research project can focus either on sample processing (i.e., DNA extraction and PCR) or data analysis (primarily multivariate statistics conducted in R), although an extraordinarily motivated student can likely conduct both components.

We anticipate that findings from this study will rationalise the use of peri-operative antibiotics in ESS, potentially preventing many thousands of unnecessary antibiotic prescriptions every year and improving patient outcomes from this common procedure. The results will also further describe the microbiology and inflammatory profile associated with CRS and further evaluate the efficacy of ESS in treating CRS.

#### STUDENT SKILLS:

- Statistics (ideally experience with R and RStudio)
- Molecular genetic techniques such as PCR

#### PROJECT TASKS:

1. Process human microbiome samples using common molecular biology techniques
2. Analyse human microbiome data using multivariate statistical methods in R

#### EXPECTED OUTCOMES:

- Student's Research Poster (as per clause 6 of the [Scholarship regulations](#))
- Statistically robust data to interrogate the stated hypothesis for the research

