**SUPERVISOR/S:** Joanna Hicks  
**PROJECT TITLE:** Unique sulphur acquisition mechanisms in a bacterial pathogen  
**FIELD:** Biochemistry and Molecular Microbiology  
**DIVISION/SCHOOL:** HECS - School of Health  
**PROJECT LOCATION:** Hamilton

**PROJECT ABSTRACT:**  
Sulphur is crucial for all living things, and bacteria are no exception. Sulphur containing molecules such as cysteine and glutathione play important roles in bacterial pathogens during infection by providing protection from oxidative stress from the host immune system. The strictly human pathogen Neisseria gonorrhoeae has evolved unique mechanisms for obtaining sulphur in the form needed to make these molecules. This project uses a combination of biochemical techniques including protein expression and purification, x-ray crystallography and biochemical assays to characterise proteins from the gonorrhoea bacterium to determine their role in sulphur acquisition. Determining the structure of key proteins and their function opens future avenues for new antimicrobials to overcome extensively antibiotic-resistant gonorrhoea, a global health issue.

**STUDENT SKILLS:**  
- Biochemistry experience (second year and above)  
- Accurate pipetting  
- Critical thinking  
- Microbiology skills

**PROJECT TASKS:**  
- Protein expression and purification using a bacterial host  
- Crystallisation of protein(s)  
- Characterisation of protein(s) by activity assays  
- Create Research Poster

**EXPECTED OUTCOMES:**  
- Student’s Research Poster (as per clause 6 of the [Scholarship regulations](#))  
- Optimised protein purification protocols  
- Crystallisation of protein(s)  
- Function of protein(s) determined by characterisation techniques