UNIVERSITY OF OTAGO
ŌTĀKOU WHAKAIHU WAKA

INFORMATION FOR CANDIDATES

for appointment as

Postdoctoral Fellow

DEPARTMENT OF BIOCHEMISTRY
FACULTY OF BIOMEDICAL SCIENCES

1. SUMMARY OF THE RESEARCH PROJECT

This project will produce serine hydrolases for *in vitro* structure-function characterizations. The specific goal is to identify covalent inhibitors of *Klebsiella pneumoniae* serine hydrolases (*Kp* SHs) for the development of new antibiotics as part of the Mana Tūānuku Fellowship awarded to the PI Dr. Matthias Fellner.

2. MAIN OBJECTIVES

Specific research objectives need to be completed during the project with outcomes determining extension of the position. The first objective aims to produce each targeted enzyme via an established Escherichia coli production pipeline. For each enzyme activity assays need to be established. The second objective then uses these assays to discover and characterise covalent inhibitors for each target. In tandem a third objective will see the atomic structure determination of each enzyme alone and in complex with identified inhibitors to enable structure guided drug design. The final objective aims to determine the biological role of each enzyme to further aid drug development.

- To plan and execute experiments relating to the overall objectives of the project. Specifically, objectives 1-3 of the research plan
  - Objective 1. *Kp* SHs protein production, enzyme assay establishment and optimisation
  - Objective 2. *Kp* SHs atomic structure determination
  - Objective 3. *Kp* SHs fragment screens & first-line covalent fragment inhibitors
  - Objective 4. *Kp* SHs metabolomics and lipidomics for biological substrate discovery
- To analyse data and present it at scientific meetings and write up results for publications.
- To assist with supervision and training of postgraduate students.

3. KEY TASKS

- To carry out enzyme purification and characterization techniques (*Escherichia coli* cloning and overexpression, enzyme assays, protein crystallisation, mass spectrometry).
- To work independently with minimal supervision.
- To ensure all laboratory facilities run smoothly and efficiently in support of the proposed research.
- To assist in the supervision of postgraduate students and junior staff.
- To keep up-to-date with relevant published scientific papers.
- To assist in writing scientific papers that arise from the research.
- To assist with the writing of grant applications.

4. RELATIONSHIPS

Directly responsible to:	Matthias Fellner
Supervision of:	Assistance with the supervision of students and technical staff associated with the projects.
Functional relationships with:	Members of collaborating laboratories (Pletzer, Tan, Bogyo, Lentz, Knez, Beatty). Other research staff and students in Fellner research laboratory. Other members of the Department of Biochemistry (store, purchasing and administration).

5. BUDGETARY RESPONSIBILITY

Supervise ordering of materials associated with the research.

6. PERSON SPECIFICATION

- PhD in a relevant biological science and a publication record consistent with that of an active researcher.
- Experience in relevant experimental techniques highly desirable.
- Experience in protein production via E. coli, including cloning and purification.
- Experience in functional enzyme characterisation – chromatography, electrophoresis, activity assays, binding assays etc.
- Experience in structural enzyme characterisations, in particular X-ray protein crystallography.
- A thorough, organised, and systematic approach to laboratory practice and record keeping is essential.
- Ability to relate to a wide variety of people within a research environment.
- Ability to work without direct supervision, set priorities and allocate own timetable.
- Self-motivated.
- Ability to work well in a team environment.

<u>Preferred:</u>

- Mass spectrometry experience (whole or digested protein - proteomics, lipidomics, metabolomics).
- Cryogenic electron microscopy (cryo-EM) experience.
- Small-angle X-ray scattering (SAXS) experience.
- Circular Dichroism (CD) experience.
- Microbiology experience beyond E. coli.

7. MĀORI STRATEGIC FRAMEWORK:

Act in a manner consistent with the principles and implications, and the University's commitment to te Tiriti o Waitangi as articulated in the Māori Strategic Framework.

8. PACIFIC STRATEGIC FRAMEWORK:

Act in a manner consistent with the strategies and goals contained in the University's Pacific Strategic Framework.

9. HEALTH & SAFETY:

Act and work in a manner compliant with current health and safety at work legislation and University procedures, frameworks and guidelines. Role model safe behaviour and practices, share the responsibility to prevent harm and contribute to a safe campus and work environment, including raising workplace health and safety concerns for self, students, visitors and other staff.

10. SUSTAINABILITY:

Act in a manner consistent with the University's sustainability commitments; role-modelling sustainable practices