

Project Title	SARS-CoV2 vs Zika: Who is stronger?
Supervisor	Professor Si Ming Man, Dr. Anukriti Mathur and A/Prof Dipti Dipti Talaulikar
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Lead discipline (please select one)

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|--------------------------------------------------|-------------------------------------------------|
| <input type="checkbox"/> Nursing and Midwifery | <input type="checkbox"/> Health Economics |
| <input type="checkbox"/> Allied Health | <input type="checkbox"/> Biostatistics |
| <input type="checkbox"/> Medicine | <input type="checkbox"/> Value-based Healthcare |
| <input checked="" type="checkbox"/> Pre-clinical | <input type="checkbox"/> Epidemiology |
| <input type="checkbox"/> Health Policy | <input type="checkbox"/> Other |

Outline of the project 250 words max

SARS-CoV2 and Zika viruses are some of the leading public health concerns of our generation. Inflammation is a hallmark in the pathogenesis of both of these virus infections. Therefore, understanding how the immune system controls and overcomes infections caused by these emerging viruses is of particular importance. In this project, we asked “**How are SARS-CoV2 and Zika viruses being recognised by the immune system?**”, a question which addresses the molecular basis by which these infections trigger pathological inflammation and death in humans.

The **aim of this project** is to identify the host immune receptors sensing the proteases of SARS-CoV2 and Zika virus, resulting in inflammation and cell death. The experiment outlined below will address this aim:

Experiment: You will culture mouse primary bone-marrow-derived macrophages (BMDMs) from wildtype mice and mice lacking 10 immune receptors. You will stimulate BMDMs with the purified a protease each from SARS-CoV2 and Zika virus. Immunoblotting, ELISA and cell death assays will be performed to determine which immune receptors are responsible for detecting these viral proteases.

Expected outcomes:

This proposal will provide fundamental understanding of how disease-causing viruses are recognised by the immune system. The knowledge derived from this project may inform the clinical management of infections caused by SARS-CoV2 and Zika virus, enabling more effective control of SARS-CoV2 and Zika virus infections in Australia and worldwide.

Proposed research methods

Students will gain hands-on research experience in a world-leading research institution and learn molecular and protein techniques relevant to immunology and infectious disease. These methods include immunoblotting, transfection, ELISA and mammalian cell culture.

Preferred study discipline being undertaken by the student

Medical Sciences, Biological sciences, or Medicine

Benefits to the student and to the department

This project will provide following benefits to the student:

- i) opportunity to contribute to world-class and timely research;
- ii) enhance critical thinking and research skills;
- iii) learn experimental techniques relevant to the study of immunology and infectious disease;
- iv) improve scientific writing and communication skills;

The project will provide following benefits to the department:

- i) attract students with an interest in medical research;
- ii) showcase research excellence of the Division;
- iii) promote future collaboration;
- iv) demonstrate leadership in research and education.

Alignment with Government Research Priorities 100w max

The knowledge gained from the proposed project will:

- i) enhance scientific understanding of how viral pathogens are recognised and destroyed by the immune system;
- ii) illuminate the inflammatory and cell death mechanisms controlled by the immune system.

This proposal aligns with the Australian Government's National Science and Research Priorities in the area of health.

Department within ACT Health Directorate / Canberra Health Services where the student will be based

The project will be jointly supervised in the labs of Professor Si Ming Man from The John Curtin School of Medical Research and A/Prof. Dipti Talaulikar from the Canberra Hospital.

Please submit form to preclinical.research@act.gov.au