



PROJECT SUMMARY FORM

Project Title	The role of genetic variability in <i>E. coli</i> in modulating the bioactivity of therapeutic drugs in humans.
Supervisor name	Professor Paul Pavli
CHS/ACTHD position	Consultant, Gastroenterology and Hepatology Unit
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Lead discipline (please select one)

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

Does this project involve research led by, or relating to Aboriginal or Torres Strait Islanders?

- | | |
|------------------------------|--|
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No |
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Outline of the project (250 words max)

The main goal of this project is to correlate genetic variants in *E. coli* with patient metadata to identify mutations that may explain metformin resistance in humans. We have obtained and sequenced over 250 isolates of *E. coli* from human intestinal biopsies and characterised their fitness using a range of physiological assays. This number is highly representative of the diversity of *E. coli* found in humans.

The first step is to correlate the whole genome sequencing results with metadata from the patients from whom the *E. coli* were isolated. This will include BMI, underlying health issues both chronic and acute (e.g type 2 diabetes), medication records (metformin, antibiotics), age, gender, and diet (e.g vegetarian). These results will be used to identify factors contributing to metformin resistance in diabetic patients.

Proposed research methods

Chart review, statistical correlation techniques, analysis of genetic variability from genome analysis in *E. coli*.

Preferred study discipline being undertaken by the student

Medicine

Benefits to the student and to the department

The student will become familiar with the techniques described above. The microbiome is the “new frontier” in medicine and an understanding of the various analytical techniques will provide a sound framework for further research.

How does this project align with any or all of the three strategic objectives of *Better Together: A strategic plan for research in the ACT health system* (100w max)

[Better together - A strategic plan for research in the ACT health system 2022–2030](#)

This project aligns with objectives 1-3 by creating a learning health system that generates evidence in an international collaborative study (with Filipe Cabreiro, PhD, Group Head Host-Microbe Co-Metabolism, MRC London Institute of Medical Sciences, Imperial College London) to translate high value research into effective practice by maximising the use of common medications.

ACTHD/CHS Department where the student will be based

Gastroenterology and Hepatology Unit

Will the student be in a patient facing role at any time during the project?

No

Will the student require access to CHS and/or ACTHD network / DHR / applications / database? If yes, please identify

Access to Clinical Patient Folder (CPF) will be necessary.

Will the student require CHS / ACT Health building access? If yes, please identify

Not necessarily if remote access to the CPF or Digital Health Record can be provided

Supervisor availability across key dates

Friday 10 Nov – Preplacement presentation session, Canberra Hospital Auditorium <i>Approximate duration 9am-12pm – supervisors are not required for full session. Possible Webex option.</i>	Yes
Placement period 10 Nov – 9 Feb Please indicate availability across this time. <i>E.g. leave over Christmas/New Year</i>	<i>No leave is planned except for the Public Holidays.</i>
At least two face-to-face sessions with the student each week during their 6-week placement.	Yes
Friday 9 Feb – Final presentation session, Canberra Hospital Auditorium <i>Approximate duration 9am-1pm – supervisors are not required for full session. Possible Webex option.</i>	Yes

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