



NACE PhD Project Brief

Beyond Penicillin Allergy – The National Scaling of Antibiotic Allergy Delabelling in Health Care

1. Project Overview

Project title	Beyond Penicillin Allergy – The National Scaling of Antibiotic Allergy Delabelling in Health Care
Linked NACE project / pillar	International Network of Antibiotic Allergy Nations (iNAAN) / Pillar 1, Transforming Allergy Care
Host institution	Doherty Institute, University of Melbourne Entry requirements: https://study.unimelb.edu.au/find/courses/graduate/doctor-of-philosophy-medicine-dentistry-and-health-sciences/entry-requirements/
Proposed start date	Q1 2027
Proposed duration	3 years, Full Time

2. Supervisor Team

Role	Name & title	Institution & Department
Primary Supervisor	Professor Jason Trubiano	Doherty Institute, University of Melbourne Centre for Antibiotic Allergy and Research, Department of Infectious Diseases & Immunology, Austin Health
Co-Supervisor 1	Elise Mitri	Doherty Institute, University of Melbourne Centre for Antibiotic Allergy and Research, Department of Infectious Diseases & Immunology, Austin Health
Co-Supervisor 2	Dr Sara Vogrin	Doherty Institute, University of Melbourne Centre for Antibiotic Allergy and Research, Department of Infectious Diseases & Immunology, Austin Health

3. Plain language summary

Many people are told they are allergic to antibiotics when they are not. Incorrect allergy labels often prevent people from receiving the best antibiotics and can lead to complications, including longer hospital stays, more side effects and antibiotic resistance. Australia has already shown that testing low-risk penicillin allergy labels is safe and effective. This project will expand this approach to other commonly reported antibiotic allergies, including cephalosporins and sulfonamides, improving access to first-line antibiotics for people who need them most, including those who are immunocompromised. This research will help make antibiotic allergy testing a routine part of healthcare across Australia.

4. Key Research Gap

Although substantial evidence supports the safe and effective use of direct oral challenge (DOC) to remove low-risk penicillin allergy labels, significant gaps remain for other commonly reported antibiotic allergies, particularly cephalosporins and sulfonamides. Existing studies are limited in scale, largely conducted in single-centre outpatient settings, and lack evidence for broad multidisciplinary implementation in routine healthcare. There is also no nationally coordinated framework to support systematic evaluation and delabelling of non-penicillin antibiotic allergies. Furthermore, priority populations, including First Nations Australians, sexual health service attendees, and

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immunocompromised patients, remain under-represented despite their high antibiotic use and potential benefits from improved access to first-line therapies.

5. PhD project summary

The successful implementation of hospital-based direct oral challenge (DOC) for low-risk penicillin allergy through the iNAAN platform has established Australia as an international leader in antibiotic allergy delabelling. Building on this foundation, the overarching aim of this PhD proposal is to expand the iNAAN platform beyond penicillin allergy to establish a national implementation program for low-risk antibiotic allergy delabelling. Specifically, the project will generate evidence to support the safe and effective implementation of cephalosporin and sulfonamide DOC, identify feasible and effective implementation strategies to embed antibiotic allergy evaluation into routine healthcare, and develop a sustainable registry platform capable of addressing future antibiotic allergy research priorities.

The PhD program leverages an internationally established antibiotic allergy network, mature digital infrastructure, multidisciplinary collaborators, and evidence-based implementation methodology. This research will extend delabelling beyond penicillin by generating the evidence, implementation strategies and scalable infrastructure required to transform antibiotic allergy care across Australia and establish a globally transferable model for implementation.

The PhD program will comprise six inter-connected research projects:

Project 1:

Aim: To identify current evidence gaps in antibiotic allergy delabelling across antibiotic classes and patient populations in Australia

Methodology: Scoping review using Joanna Briggs Institute methodology and PRISMA-ScR reporting to systematically map evidence gaps in antibiotic allergy delabelling across antibiotic classes and patient populations in Australia.

Anticipated research outcomes: The findings of this scoping review will establish national antibiotic allergy research priorities and inform subsequent implementation studies.

Project 2:

Aim: To synthesise the international evidence for DOC for cephalosporin and sulfonamide allergy

Methodology: Paired systematic reviews and meta-analyses reported using the PRISMA guidelines to evaluate the safety and effectiveness of DOC for cephalosporin and sulfonamide allergy.

Anticipated research outcomes: These systematic reviews will consolidate the available international evidence base, identify remaining evidence gaps, and inform subsequent implementation studies.

Project 3:

Aim: To develop a protocol for a multicentre Type II hybrid effectiveness-implementation trial evaluating cephalosporin and sulfonamide DOC using the established iNAAN digital platform.

Methodology: The trial protocol will define eligibility criteria, cephalosporin and sulfonamide DOC pathways, effectiveness and implementation outcomes, data collection procedures, safety monitoring, and a randomised 1:4 factorial implementation strategy – i) Education ii) Audit and Feedback iii) Education plus Audit and Feedback iv) Standard implementation (control). The protocol will incorporate digital decision support and data collection via a smartphone +/- web application, clinician education and audit and feedback, and will be reported in accordance with relevant SPIRIT and implementation trial reporting guidance.



Project 4 and 5:

Aim: To evaluate the safety, effectiveness and implementation of multidisciplinary-led DOC for low-risk cephalosporin and sulfonamide allergies in adult inpatients

Methodology: Type 2 Hybrid Effectiveness-Implementation Trial

Interventions:

- Effectiveness - Direct oral challenge for low-risk cephalosporin or sulfonamide allergy
- Implementation – Cluster randomised implementation strategy (1:1:1:1) – Education, Audit and Feedback, Education and Audit and Feedback, Standard implementation

Outcomes:

- Effectiveness – safety (proportion delabelled), antibiotic utilisation, hospital length of stay, hospital readmission, healthcare savings
- Implementation – adoption of cephalosporin and sulfonamide allergy assessment per hospital admissions, impact of an implementation strategy on adoption of assessment and direct oral challenge, fidelity, acceptability, feasibility, sustainability

Anticipated research outcomes: This project will establish the evidence and implementation strategies required to expand routine antibiotic allergy delabelling via DOC beyond penicillins. Expected outcomes include real-world evidence evaluating cephalosporin and sulfonamide DOC, expansion of the iNAAN platform to multiple antibiotic classes and improved antimicrobial stewardship outcomes through increased access to first-line antimicrobials.

Project 6:

Aim: To expand the iNAAN registry into a sustainable national platform capable of supporting randomised controlled trials addressing priority antibiotic allergy evidence gaps.

Methodology: Development and expansion of the iNAAN digital registry platform to support embedded registry-based randomised controlled trials. The platform will integrate standardised electronic data capture via smartphone and/or web-based application, clinical decision support, participant randomisation, outcome collection, and follow-up.

Anticipated research outcomes: This infrastructure is expected to enable efficient multicentre evaluation of priority antibiotic allergy evidence gaps identified through the initial scoping review (Project 1) and establishing a sustainable national research platform extending beyond the life of the PhD program.

6. Contact

If you have any questions, please contact for:

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