



# NHMRC CRE IN SKIN IMAGING AND PRECISION DIAGNOSIS

Recent advances in 3D total-body skin imaging and artificial intelligence algorithms are posed to change the practice of skin cancer diagnosis. This CRE will develop the research base for a targeted nationwide skin cancer screening program in Australia.

Knowledge  
Generation  
and  
Translation

Research  
Capacity  
Building

Collaboration

## WHY WE NEED TO IMPROVE SKIN CANCER EARLY DETECTION

Skin cancers, including melanoma, present a significant health, social and economic burden in Australia. Despite the rising incidence of melanoma, the most deadly form of skin cancer, there is currently no national or population-based screening program available.

### OUR AIM

The aim of this CRE is to identify how skin imaging and artificial intelligence technologies can be integrated into the clinical care pathway to improve early detection, and ultimately reduce the health and economic burden caused by skin cancer.

### OUR OBJECTIVES

- Improve skin cancer early diagnostic processes and procedures through 3D total-body imaging and artificial intelligence
- Develop less invasive biopsy techniques called scarless biopsies (tape stripping)
- Improve support for skin self-examination
- Evaluate the economic impact of new technologies
- Understand stakeholder trust and acceptance
- Train future leaders in the field in these new technologies
- Translate research outcomes into developing the roadmap for a nationwide, targeted skin cancer screening program in Australia



The CRE is a 5 year project from November 2021 - November 2026



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## CORE STUDY:

### AUSTRALIAN CENTRE OF EXCELLENCE IN MELANOMA IMAGING & DIAGNOSIS (ACEMID)

This CRE builds on a world-first network of 15 3D total-body imaging devices across QLD, NSW and VIC connected by a telehealth research network.

All CRE Programs will use data generated by the CRE core study (ACEMID). The core study will recruit 15,000 participants to monitor their skin over 3 years in metropolitan, regional and rural hospitals.

The CRE core study will collect 3D total-body skin surface imaging data. It will collect clinical, dermoscopy, pathology, behavioural, proteomics and genomics data. We will develop artificial intelligence algorithms and risk assessment tools from this dataset.

ACEMID is the largest ever clinical imaging study on skin cancer in Australia.



## CONSUMER FOCUSED SOLUTIONS



The CRE has developed a consumer framework through the ACEMID Consumer & Community Engagement Working Group to ensure the research remains person-centred and transformative for end users. In this group researchers form equal partnerships with representatives from consumer organisations, as well as melanoma advocates and study participants who are involved in the whole research process. Consumers are also represented on the ACEMID Executive Committee.

## CONSUMER FORUMS

The CRE will hold annual Community and Consumer forums. These forums allow ACEMID researchers to update the public on their research progress and gather information that informs their research directions.



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This CRE will involve six programs anchored by the CRE core study. These programs will generate evidence for the improvement of the clinical care pathway and the translation of research outcomes into practice.

## CRE CORE STUDY: ACEMID

### CLINICAL CARE PATHWAY



#### Program 1: Macro Imaging

3D total-body photography



#### Program 2: Micro Imaging

Individual skin lesion classifiers



#### Program 3: Scarless Biopsy

To reduce the number of unnecessary biopsies and overdiagnosis, scarless biopsies (special adhesive tape) could be developed to greatly reduce the need for excisions and save costs.

We aim to develop algorithms that automatically identify and score naevus, freckling, and sun damage phenotypes, and integrate them in melanoma risk assessments and diagnostic artificial intelligence.

### TRANSLATION OF RESEARCH OUTCOMES



#### Program 4: Consumer-driven Self-Management

Digital tools along with the evidence from macro- and micro-imaging with artificial intelligence support, and scarless biopsies could be integrated into clinical and home care patient pathways.



#### Program 5: Economic Evaluation

Framework for economic evaluation of technologies



#### Program 6: Governance and Evaluation

Framework for ethical, legal and social governance



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The CRE is led by The University of Queensland, in collaboration with The University of Sydney, and Monash University, and builds on well-established linkages with other research entities, hospitals, technology & health services, and consumer groups.

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ACEMID AUSTRALIAN CENTRE OF EXCELLENCE IN  
Melanoma Imaging & Diagnosis