



# ACRF AUSTRALIAN CENTRE OF EXCELLENCE

# Melanoma Imaging and Diagnosis

HIGHLIGHTS OF THE 2024 ANNUAL REPORT Finalised on 22nd February 2024



THE UNIVERSITY OF QUEENSLAND A USTRALIA





# **Executive Summary**

ACRF AUSTRALIAN CENTRE OF EXCELLENCE IN

# **Melanoma Imaging & Diagnosis**

Vision: A World Without Melanoma Purpose: Establish a network of 3D total body imaging systems to improve early diagnosis and surveillance of melanoma

# ACRF ACEMID is conducting the WORLD's largest melanoma imaging study

Advancing melanoma research and paving the way for a national targeted melanoma screening program

### ACRF ACEMID Recruitment

We aim to recruit **15,000** participants, with over **5,400** participants enrolled

# OLD EnrolmentsNSW EnrolmentsVIC Enrolments2427 people have<br/>been enrolled into 5<br/>QLD sites.1485 people have<br/>been enrolled into 2<br/>NSW sites.1504 people have<br/>been enrolled at 4<br/>VIC sites.

# Since 2021, ACRF ACEMID have established 14 sites across Australia.



## THE ACRF ACEMID PROJECT

The vision of the ACRF Australian Centre of Excellence in Melanoma Imaging and Diagnosis (ACRF ACEMID) is a "World Without Melanoma". To achieve this vision, ACRF ACEMID is delivering a next-generation, precision strategy of skin imaging technology integrated within a telemedicine research network spanning 15 dermatology research sites across Queensland (QLD), New South Wales (NSW), and Victoria (VIC) to reconceive how melanoma is screened for and detected. ACRF ACEMID will:

- Establish a network of state-of-the-art 3D total body imaging systems to form a multidisciplinary and multi-site centre of excellence; the first of its kind internationally.
- Integrate and leverage world-class research expertise that is unique to Australia to provide technologically disruptive and reliable solutions for the early diagnosis of melanoma, particularly for people at high and ultra-high risk and spanning urban and regional/rural areas.
- Champion a reduction in the overarching burden, morbidity and mortality associated with the 17,000 invasive melanomas and 28,000 in situ melanomas occurring yearly in Australia by helping ensure that healthcare services are targeted effectively and equitably to Australians most in need. Channelling people into risk stratified screening or surveillance programs will enable significant personal and health care system cost-savings.

The ACRF ACEMID lead researchers are Prof H. Peter Soyer (The University of Queensland (UQ), QLD), Prof Pablo Fernandez-Peñas (The University of Sydney (USyd), NSW) and A/Prof Victoria Mar (Monash University, VIC), with Prof Monika Janda (UQ) chairing the ACRF ACEMID Research Program Committee. The core research team, in combination with an exceptionally strong, multidisciplinary team of additional researchers, and alongside senior health, informatics, and hospital staff, enable the successful implementation of ACRF ACEMID.

### ESTABLISHMENT OF ACRF ACEMID SITES

#### There are 14 ACRF ACEMID sites established.

#### Four sites were established in 2023 and early 2024.

- Pinnacle Dermatology Orange, NSW in January 2024.
- Port Macquarie Community Health Centre, NSW in August 2023.
- Mt Isa Hospital, QLD in July 2023.
- Sunshine Coast University Hospital (SCUH), QLD in February 2023.

# Adding to the ten ACRF ACEMID sites established during 2022 and 2021.

- Peter MacCallum Cancer Centre (PMCC), Melbourne, VIC in October 2022.
- Wonthaggi Hospital, Bass Coast, VIC in September 2022.
- Bendigo Hospital, VIC in July 2022.
- Herston Imaging Research Facility (HIRF), Brisbane, QLD in February 2022.
- Cairns Hospital, QLD in January 2022.
- Skin Health Institute (SHI), Melbourne, VIC in August 2021.
- Westmead Hospital, Sydney, NSW in June 2021, relocated in May 2022.
- Melanoma Institute Australia (MIA), Sydney, NSW in May 2021.
- The Alfred Hospital, Melbourne, VIC in May 2021.
- Princess Alexandra Hospital (PAH), Brisbane, QLD previously established in 2017 with the original commercial version of the 3D total body imaging system. This was replaced in March 2023 with the latest updated technology.

Wagga Wagga, NSW is the last of the 15 ACRF ACEMID sites and will be installed in March 2024.



Port Macquarie site, NSW



Mt Isa Hospital site, QLD

## ACRF ACEMID COHORT STUDY

The ACRF ACEMID Cohort Study is the core study utilising the ACRF funded 3D total body imaging systems for the early detection of melanoma and other skin cancers.

The Cohort Study has enrolled over 5400 participants as of February 2024 at the 11 active ACRF ACEMID sites and aims to enrol up to 15,000 adult participants across the 15 ACRF ACEMID sites in QLD, NSW, and VIC.

ACRF ACEMID Site	Start Date	Participants
PAH, QLD	Feb 2021	999
MIA, NSW	Aug 2021	973
SHI, VIC	April 2022	429
Westmead Hospital, NSW	July 2022	512
HIRF, QLD	Aug 2022	1151
The Alfred Hospital, VIC	Sept 2022	613
Bendigo Hospital, VIC	Nov 2022	394
SCUH, QLD	April 2023	213
Cairns Hospital, QLD	June 2023	60
Wonthaggi Hospital, VIC	Aug 2023	68
Mt Isa Hospital, QLD	Jan 2024	4

The remaining four sites (Port Macquarie, Orange, Wagga Wagga in NSW; PMCC, VIC) are anticipated to commence Cohort Study recruitment by mid-2024.

Study participants are placed into 3 groups based on their calculated risk of melanoma with study visits occurring 6 monthly for the very high-risk group, 12 monthly for the high-risk group, and 24 monthly for the low/average risk group.

The Cohort Study collects a range of data including total body and linked dermoscopy images, questionnaire data (including demographics, behavioural, quality of life, personal and family history), and clinical data. Approval has also been obtained to access Medicare Benefits Schedule (MBS) and Pharmaceutical Benefits Schedule (PBS) data.

Processes to retrieve, scan and review the histopathology slides of participants biopsied lesions have been

established. All melanoma or borderline lesions, and an equal number of benign lesions will be analysed.

Saliva sample collection, for future genetic analyses, has also commenced at the central metropolitan sites in each state, with 668 samples collected to date.

The Cohort study, led by A/Prof Victoria Mar (Monash Uni), is funded by a NHMRC Clinical Trials and Cohort Studies Grant (APP2001517). Ethics approval and clinical trial registry details: Metro South Human Research Ethics Approval number HREC/2019/QMS/57206, UQ Ethics Approval number 2019003077, ANZCTR12619001706167.

# **IMAGE TRIAL**

The IMAGE Trial officially launched in February 2021, with 10 sites across metro and regional QLD, VIC, and NSW, utilising the ACRF ACEMID 3D total body imaging systems where available and 2D total body photography otherwise. Of these 10 sites, four are ACRF ACEMID sites (Alfred Hospital, PAH, SHI, Westmead Hospital).

The recruitment target of 670 participants was achieved in April 2023, with 128 undergoing 3D total body imaging at the four ACRF ACEMID sites

Whilst Melanoma Surveillance Photography (MSP) is recommended in the Australian melanoma clinical practice guidelines for surveillance of high-risk individuals, the Medical Services Advisory Committee (MSAC) identified several gaps in the evidence which require addressing before an informed recommendation about Medicare Benefits Schedule listing of MSP can be made.

The IMAGE Trial will address these evidence gaps and determine the extent to which MSP, comprised of 2D and 3D total body photography plus digital dermoscopy, improves diagnostic performance for melanoma and reduces the number of biopsies during the surveillance of high- and very high-risk individuals.

The IMAGE Trial, led by A/Prof Victoria Mar (Monash Uni), is funded by an MRFF Targeted Health System and Community Organisation Research Grant – Melanoma Surveillance Photography to improve early detection of melanoma in very high risk (or high risk) patients (APP1175082). NCT04385732



Researcher workshop photo

ACRF Australian Centre of Excellence in Melanoma Imaging and Diagnosis - Highlights of the 2024 Annual Report

# CRE IN SKIN IMAGING AND PRECISION DIAGNOSIS

This Centre of Research Excellence (CRE) is focused on enhancing melanoma early detection and diagnosis through improved diagnostic processes and procedures, consists of six work programs, and will use data generated by the ACEMID Cohort Study.

CRE Programs 1 & 2 aim to develop and improve artificial intelligence (AI) algorithms, such as naevus, freckling and sun damage scores. A naevus identification algorithm developed by the team provides relatively accurate counts for contribution to risk scores and is now undergoing enhancements to improve its ability to differentiate between seborrheic keratosis and naevi. A photo numeric scale has been developed to rate photodamage and freckling density and work is now underway to label images and develop the respective AI models.

CRE Program 3 is investigating the scarless biopsy method (also called tape stripping) and aims to collect 1000 lesion samples. To date, 40 participants have enrolled and provided 79 samples.

CRE Program 4 centres on integrating personalised homebased digital imaging support as part of the melanoma surveillance pathway. The ACRF ACEMID Consumer Working Group are contributing to this program and a systematic review on the use of apps for skin self-examination is continuing.

CRE Program 5 aims to assess what study designs and validation methods are needed for health technology assessment of AI and omics driven diagnostics. Currently interviews are being conducted with health technology assessors to help us understand how they evaluate precision medicine technologies.

CRE Program 6 looks at the framework for ethical, legal, and social governance, particularly for privacy and confidentiality in dermatology imaging. A data governance framework is being developed, taking into account the sensitivity of the 3D total body images.

An overview of this project can be found on the ACRF ACEMID <u>website</u>.

The CRE project, led by Prof Monika Janda (UQ), is funded by a NHMRC Centre of Research Excellence Grant (APP2006551).

# ROADMAP OPTIONS FOR MELANOMA SCREENING IN AUSTRALIA

This project aims to co-design a precision targeted melanoma screening approach to inform clinical and policy recommendations for an effective national risk-stratified melanoma screening program.

It will provide a blueprint for a nationwide policy strategy for effective skin screening and surveillance, by evaluating risk stratification and who needs targeted skin screening, and investigating stakeholder trust, both by consumers and clinicians.

A program of work is being undertaken in relation to risk stratification. External validation of various melanoma risk assessment tools has been conducted, and the additional value of 3D total body imaging mole counts has also been assessed, with publications pending. Evaluation of the use of online melanoma risk assessment tools and skin imaging technologies among the Australian community and health professionals, via online surveys and interviews, is underway.

Stakeholder trust and acceptance is crucial for the uptake of technology-based health services, both by consumers and clinicians. Survey results outlining consumer acceptance of 3D total body imaging was published in 2023, with the team now focusing on the perspectives of clinicians. Interviews have been conducted to determine clinician attitudes towards the incorporation of AI tools into skin cancer detection and how they perceive AI will impact trust with consumers, with the respective analyses in their final stages.

An overview of this project can be found on the ACRF ACEMID website.

This project, led by Prof Monika Janda (UQ), is funded by a NHMRC Synergy Grant (APP2009923).

# **ENGAGEMENT ACTIVITIES**

#### **CONSUMER ENGAGEMENT**

The project team established a Consumer & Community Engagement Working Group in 2021, chaired by melanoma advocate Mr Craig Lawn, and continue to prioritise their close engagement and interaction with consumers.

Over the last 12 months the Consumer Working Group compiled their perspectives around AI and the use of AI in medicine, sharing their views via a presentation at the 2023 Australasian College of Dermatologists meeting in Sydney. They also continued to develop and submit applications to consumer-led funding opportunities, and actively contributed to grant applications submitted by the project team.

The project team interactions expanded during 2023 to become a member of the Australian Melanoma and Skin Cancer Alliance. AMSCA is a neutral entity, chaired by Alison Button-Sloan, uniting melanoma consumer, research and clinical organisations from around Australia with the common goal of improving outcomes for people affected by melanoma and skin cancer.

The third ACRF ACEMID <u>Consumer Forum</u> addressed the topic of 'Skin Checks in Australia – How do we reach the right people at the right time?' It was held as part of the ACRF ACEMID Annual Research Workshop in Sydney on the 1st December 2023.

Nearly 100 consumers and researchers joined the consumer forum, which was facilitated by melanoma advocate Craig Lawn. Attendees were provided with an update on the ACEMID Cohort Study and an overview of the current landscape of skin checks in Australia. The consumers then engaged in an interactive polling session that collected information about the use of melanoma risk tools, knowledge of personal melanoma risk, and skin check activities.

#### STAKEHOLDER ENGAGEMENT

Our collaborative engagement continues with the numerous ACRF ACEMID consortium partners, whose valuable contributions are essential for the success of the project. Over the last 12-18 months, the project engagement has expanded to include a broader range of stakeholders. This has included interaction with health professionals and peak health bodies to obtain their views on specific research topics and to disseminate information about the ACRF ACEMID project, its outcomes and vision, paving the way for future translational impact.

The project team have also been developing relationships and exploring partnership opportunities with the Australian Governments National Collaborative Research Infrastructure Strategy (NCRIS) capabilities, including the Australian Research Data Commons and the NCRIS Health Group (National Imaging Facility, Bioplatforms Australia, Phenomics Australia, Population Health Research Network, Therapeutic Innovation Australia), who have significant expertise of relevance to the ACEMID project.

Government engagement activities also encompass interactions with the Parliamentary Friends of Melanoma and Skin Cancer Awareness group in events organised by the Melanoma and Skin Cancer Advocacy Network (MSCAN). These events enable parliamentary representatives to be informed about the ACRF ACEMID project, the importance of early detection to melanoma outcomes, and our vision to work towards the development of a national targeted melanoma screening program.

## ADDITIONAL ACHIEVEMENTS

The ACRF ACEMID project team is comprised of over 40 investigators and continues to expand as the 3D total body imaging sites are established and additional research studies are initiated.

The project team are actively contributing to the development of the next generation of melanoma and skin cancer researchers, mentoring 15 post-doctoral researchers/clinical fellows and 17 PhD/MPhil students during 2023 - 2024.

There have been eight peer reviewed journal articles, and one clinical specialist college publication article, published since 2022, with more publications anticipated once the research data starts to accumulate from the Cohort Study and IMAGE Trial.

Over the last 12 months the project team has been successful in obtaining \$4.1 million in competitive research funding. This included a MRFF Digital Health Interventions grant (APP2025140), led by Prof Rachael Morton (USyd), to assess the impact of enhancing face-to-face skin cancer services with data from digital health technologies such as 3D total body imaging, digital dermoscopy, and AI driven lesion diagnosis; and a MRFF Critical Research Infrastructure grant (MRFCRI000002), led by Dr Ryan Sullivan (USyd), to deliver a secure national platform for privacy preserving analysis of sensitive imaging and multiple health data resources using machine learning, enabling the transformation of healthcare research.



Parliamentary Friends event (2023)









