MEDICAL ADVANCES WITHOUT ANIMALS

ABOUT THE MAWA TRUST

DEVELOPING ALTERNATIVES TO ANIMAL RESEARCH

MAWA'S AIM

The aim of The Medical Advances Without Animals Trust (MAWA) is to advance medical science and improve human health and therapeutic interventions without using animals or animal products for biomedical research.

MAWA'S HISTORY

The MAWA Trust was established in 2000 by Ms Elizabeth Ahlston and Associate Professor Garry Scroop, with Professor Stephen Leeder AO, then Dean of Medicine, the University of Sydney, later Editor-in-Chief of the Medical Journal of Australia, as its first Chair. MAWA is an Australian organisation and a registered charity which began operations in Sydney but moved its administrative base to Canberra in 2007 to take advantage of research and funding opportunities. The MAWA Trust has three Trustees: Ms Elizabeth Ahlston, Professor Anne Keogh AM and The Honourable Kevin Rozzoli AM.

MAWA FOUNDERS, CHAIRS AND TRUSTEES


Assoc Prof Garry Scroop


Ms Elizabeth Ahlston


Prof Stephen Leeder AO


Prof Anne Keogh AM


The Hon Kevin Rozzoli AM

MAWA'S EXPERTISE

The Trust has appointed Ms Sharyn Watson as its Executive Director and is managed by a Board which includes senior scientists in medicine and other members with valuable expertise in a broad range of areas crucial to MAWA's operations. The Trust has also established a Scientific Advisory Panel which MAWA calls on for advice and review of research projects submitted for MAWA funding. Membership of MAWA's Advisory Panel comprises senior scientists, researchers, academics and medical consultants with expertise across a range of disciplines, many with international profiles and considered to be leaders in their fields. A number of experts in law, ethics, philosophy and other relevant disciplines are also represented on, or are available to, the panel.

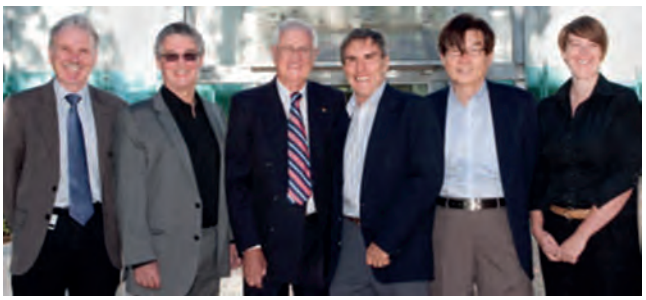
ANU/MAWA PARTNERSHIP - A MAJOR INITIATIVE

The MAWA Trust has formed a partnership with The Australian National University (ANU) to establish the Australian Centre for Alternatives to Animal Research (ACAAR). The Centre will provide a focal point for alternatives research, act as a knowledge and technical resource, and develop and implement strategies to facilitate a broad adoption of replacement methods. As a first step MAWA awarded funds to the ANU for three Fellowships, the appointment of an A/Professor in Alternatives to provide scientific leadership in replacement research and a range of grants, scholarships and bursaries.


The Hon Kevin Rozzoli, MAWA Chair, with Prof Kiaran Kirk, Dean, College of Medicine, Biology & Environment after a new round of MAWA Grants and Fellowship Awards to the ANU in 2017.

The ANU has been named in the top 10 of the world's international universities. The *2017 Times Higher Education International Universities Rankings* has ANU at 7th in the world and between the University of Oxford (6th) and the University of Cambridge (8th). The ANU was the highest ranked Australian university for the fourth year in a row.

Pictured after the signing of the ANU/MAWA Partnership Agreement in 2010 are some of the senior academics and executives who provided valuable guidance and strong support for MAWA's initiatives. MAWA is particulary appreciative of the support of Professors Aidan Byrne and Kiaran Kirk.


Prof Aidan Byrne, Dean of Science and Director, College of Physical and Mathematical Sciences,(later CEO Australian Research Council); Prof Simon Easteal, Deputy Director, JCMSR; Dr Simon Bain, Director Research Integrity; Prof Shin-Ho Chung, Research School of Biological Sciences; Ms Karen Jackson, Manager, ANU Joint Colleges of Science Research Office in 2010.

ANU/MAWA PROGRAM

The ANU based research program began with the establishment of an alternatives bioinformatics research group in the John Curtin School of Medical Research (JCSMR), Australia's national medical research institution, and by supporting computational biophysics research projects in the ANU's highly regarded Research School of Biology and Research School of Chemistry. The ANU has also been awarded research grants, scholarships and bursaries for other replacement projects and for researchers and scholars to travel to overseas institutions for training. The work at ANU both complements and contributes to a range of research projects which MAWA supports in other Australian universities and research institutions.

HOW MAWA OPERATES

MAWA operates as an independent medical research and educational trust fund which facilitates the development and utilisation of non-animal based experimental methods to replace the use of animals in biomedical research. It is expected that by funding replacement research and training scientists in alternative techniques the reliance on the use of animals will be decreased. MAWA also encourages, through promotion and education, the wider adoption of such methods.

MAWA'S EUREKA PRIZE WINNER AND FINALIST

PHARMACOLOGY/TOXICOLOGY

Dr Hala Raghib
School of Medical Sciences
RMIT University

MAWA Doctoral Scholar Dr Hala Raghib won a prestigious Eureka Prize in 2007 for developing a genetically engineered human cell line to monitor drug action to replace animal testing. She was also listed as one of Melbourne's 'Top 100' most powerful and innovative personalities for scientific achievement. Dr Raghib now works in the pharmaceutical industry and lectures at the ACU.

MAWA Doctoral Scholar Dr Eric Han who developed a safe and reversible human model of nerve injury to replace animal experiments causing injury and pain was a finalist for a Eureka Prize in 2011 and 2012. Dr Han is now a lecturer and researcher at UNSW and serves on MAWA's Board and Scientific Advisory Panel.

NEUROPHYSIOLOGY/BIOMECHANICS

Dr Eric Han
Neuroscience Research Australia
& Faculty of Medicine UNSW

MAWA'S APPROACH

The Trust is taking a leading role in animal replacement in biomedical research and deliberately fosters dialogue with the scientific research community to discover common ground to achieve its goals. MAWA Board members are aware that an increasing number of medical scientists are attempting to replace animals wherever possible in line with the National Health and Medical Research Council (NHMRC) Code of Practice and that new graduates, in particular, are increasingly concerned with the ethical dilemmas they have to face when using animals or animal products in their research projects.

MAWA's approach is positive. MAWA's position is that to achieve real progress the Trust must engage with scientists and academics and together work for change. Rather than focusing on practices which the Trust does not support, MAWA concentrates on finding and implementing solutions and works cooperatively and productively with the research community. By maintaining this focus and building relationships with researchers, MAWA has been very successful in promoting its ideals, developing collaborations and partnerships, and identifying funding opportunities.

EXAMPLES OF ALTERNATIVE METHODS SUPPORTED BY MAWA

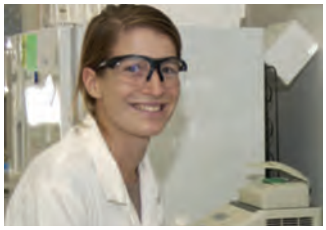
MAWA funded scholars and researchers have developed and utilised a number of alternative methods to replace animal use including: *in vitro* research using human cell and tissue cultures; human gene studies; post mortem studies; stem cell research; analytical technology; molecular research; plant tissue cultures; mathematical models; computer simulations; ethical clinical research with volunteer patients and healthy subjects; and bioinformatics and population studies.

MAWA HONOURS SCHOLARS

The Trust invites students from Australian universities to apply for MAWA Honours Research Scholarships for projects that meet MAWA's criteria. The aim of this initiative is to attract new graduates at the beginning of their research careers to train in advanced non-animal technologies. For example, Honours scholars supported by MAWA (pictured below) have replaced animals by using: (1) human DNA samples; (2) *in vitro* methods; (3) structure based drug design; and (4) microbiological models. Other MAWA Honours scholars have utilised a range of alternative methods with successful outcomes.

FOUR OF MAWA'S HIGHLY AWARDED HONOURS SCHOLARS

(1) PREDICTIVE MEDICINE



Ms Mace Neve, First Class Honours
John Curtin School of Medical Research
The Australian National University

(2) BIOENGINEERING

Mr Michael Stevens, First Class Honours
School of Engineering Systems
Queensland University of Technology

(3) BIOCHEMISTRY

Ms Karina Turci, First Class Honours
Molecular & Biomedical Sciences
The University of Adelaide

(4) MOLECULAR CELL BIOLOGY

Mr Mersad Delic, First Class Honours
School of Medical Science
Griffith University

IN ORDER TO EXPAND THE WORK OF THE MAWA TRUST AND
MAKE A WORTHWHILE IMPACT WE NEED YOUR HELP
ALL DONATIONS TO MAWA ARE TAX DEDUCTIBLE

MAWA FUNDING

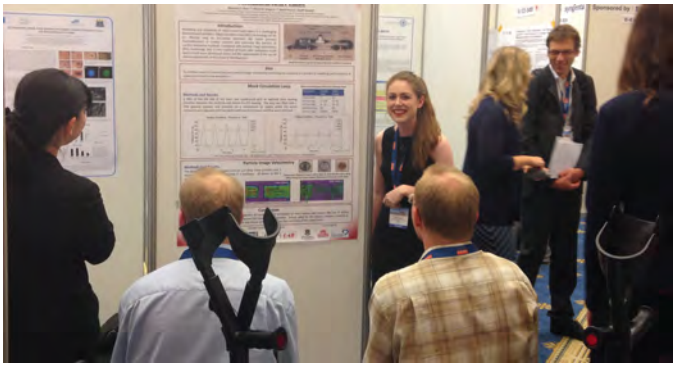
MAWA funding is provided through the award of: research, development and equipment grants; fellowships; doctoral, masters, honours, bridging and supplementary scholarships; and travel bursaries. The Trust also provides funding assistance for: distinguished scholar tours; the development of training programs in alternatives; sponsorship of significant symposiums, seminars and conferences; open access of pertinent scientific journal articles; and individuals to attend relevant Australian and international conferences.

RESEARCH STREAMS

MAWA does not limit its support to any particular research stream but encourages applications from a broad range of disciplines within, for example, biological sciences, medical sciences, computer sciences, mathematical sciences and bioengineering. MAWA also encourages transdisciplinary and collaborative approaches both within and across institutions and the emergence of areas of research strength.

9TH WORLD CONGRESS ON ALTERNATIVES, PRAGUE

MEDICAL ENGINEERING



MAWA Recipient Maureen Ross discusses her work at the World Congress

MAWA representatives attended the 9th World Congress on Alternatives (WC9), in Prague, in the Czech Republic. MAWA's Executive Director Sharyn Watson presented on MAWA's experience of partnering with a major university and taking a 'Replacement only' approach rather than the widely adopted '3Rs' (Replacement, Reduction and Refinement) in biomedical research.

MAWA was delighted that two Australian scholars supported by the Trust, Johanna Frolich and Maureen Ross, were accepted to present at the congress and Johanna was awarded a WC9 Travel Scholarship in addition to the MAWA funding awarded to both students. Maureen is currently continuing her research at the University of Queensland.

UNDERGRADUATE COURSE DEVELOPMENT IN ALTERNATIVES

MAWA recipient Assoc Prof Ian Macreadie, who is developing alternative methods in Alzheimer's research, has also introduced replacement science to undergraduate teaching for students enrolled in biomedical sciences at RMIT University. MAWA was delighted with the outcomes from the inaugural course and that it was offered again in the following year.

Students are also given the opportunity to present their work at RMIT University's Community Consultation Day. Two students from the pictured group, Eva Vidacs and Kiara Simonis (top left and bottom left), have been selected for MAWA Ambassadorial roles. Kiara is currently undertaking a Doctor of Veterinary Medicine at the University of Melbourne and Eva is currently considering her options with a view to a similar path.

BIOMEDICAL SCIENCES

Student team from RMIT University Undergraduates Alternatives Course

MAWA DOCTORAL SCHOLARS

Doctoral research scholarships were established with the specific intention of highlighting the scientific and practical advantages and merits of non-animal research, and encouraging new scientists to advance the development, validation and application of replacement methods in medical research. For example, Doctoral scholars supported by MAWA (pictured below) have replaced animals by the development of: (1) an animal blood-free medium for culture based diagnosis; (2) statistical analyses of virulence; (3) internal jugular sampling in humans; and (4) proteomic methods. Other Doctoral scholars have developed a range of alternative techniques with successful outcomes.

FOUR DOCTORAL SCHOLARS SUPPORTED BY MAWA

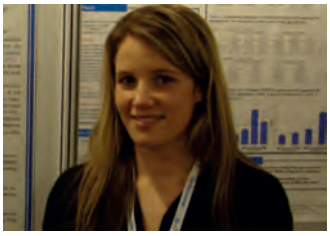
(1) PUBLIC HEALTH MICROBIOLOGY

Dr Rashmi Fotedar
The Prince of Wales Hospital &
Faculty of Medicine UNSW

(2) VIRULENCE STUDIES

Dr Brett Mitchell
James Cook University &
The Australian Catholic University

(3) NEUROSCIENCE



Dr Charlotte Keating
Monash Alfred Psychiatry Research Centre
Monash Univeristy

(4) PROTEOMICS

Dr John Ng
Lowy Cancer Research Centre &
Faculty of Medicine UNSW

MAWA'S RESEARCH PORTFOLIO

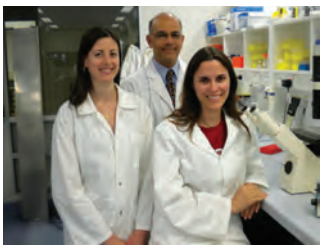
MAWA's research focus is on fundamental medical research to improve understanding of human illnesses, their causes, progression, and the underlying features to facilitate prevention, early diagnosis and effective treatment. MAWA Research Grants provide funds to support research projects of one to three years duration. The Trust has supported research into a vast range of diseases, disorders and disabilities. Some examples are: cancer; heart disease; diabetes; stroke; dementia; obesity; multiple sclerosis; neurological disorders; depression and acute and chronic pain studies.

EXAMPLES OF MAWA FUNDED RESEARCH PROJECTS

(1) EXPERIMENTAL BIOPHYSICS

Prof Boris Martinac
Mechanobiology Laboratory
Victor Chang Cardiac Research Institute

(2) NUTRITION & METABOLISM



Prof Samman & Drs Karra & Foster
School of Molecular Bioscience
The University of Sydney

(3) ONCOLOGY

Drs Kristy Brown, Ashwini Chand & Colin Clyne
Prince Henry's Research Institute
Monash Medical Centre

(4) VASCULAR IMMUNOLOGY

Prof Georges Grau
Sydney Medical School
The University of Sydney

Examples pictured above: (1) the development of an alternative approach utilising yeast models and human cells to replace traditional studies of ion channels in animal tissues or animal models; (2) the investigation of zinc transporters in humans to replace the common practice of using animals to study zinc deficiency; (3) the validation of the use of human-derived cells/tissues to replace current methods using animals in breast cancer research; and (4) the utilisation of a human *in vitro* blood-brain barrier model for the study of multiple sclerosis to replace the use of animal models.

MAWA'S SUPPORT FOR TISSUE BANKS

Currently large numbers of animals are used in experiments that model human disease in an attempt to understand why human hearts fail. MAWA has awarded funding to the Sydney Heart Bank (SHB) to enable research to be conducted using available high-quality human heart tissue while reducing and ultimately eliminating the use of experimental animal models of heart failure. SHB aims to advance our understanding of the genetic, molecular and mechanical changes that lead to heart failure with the hope of one day finding a cure. The SHB is one of a few, and is by far the largest, human cardiac bio-bank with resources available to researchers across the globe. MAWA has also provided funding support for MS Research Australia's Brain Bank to facilitate research into multiple sclerosis.

THE SYDNEY HUMAN HEART BANK

Prof Cris dos Remedios, Dr Sean Lal & Dr Amy Li, The University of Sydney

CONGRATULATIONS TO MAWA GRANT RECIPIENTS

THEORETICAL & COMPUTATIONAL CHEMISTRY

Dr Megan O'Mara, Rita Cornforth Fellow, ANU

The Trust has been delighted not only with the excellent results achieved by MAWA scholars across many universities, but also their commitment to replacing animal use in their particular field. Similarly MAWA has been impressed by the outcomes from its diverse research portfolio with many scientists publishing in high ranking journals, and being selected to present their work internationally. This is a clear demonstration of a significant contribution to their fields of research. Congratulations to all MAWA recipients and more recently to: MAWA ANU Fellow Dr Rong Chen (pictured below right) who was subsequently awarded a prestigious and highly competitive NHMRC Early Career Fellowship which is currently funding his research for a further four years; and to Dr Megan O'Mara (pictured above) who, with Dr Evelyne Deplazes from the University of Queensland, was awarded MAWA funding, for her subsequent award of the prestigious and internationally competitive Rita Cornforth Fellowship.

MAWA FELLOWSHIPS

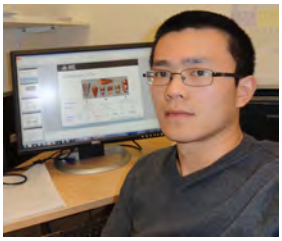
NEUROSCIENCE & THEORETICAL PHYSICS

Dr Andre Peterson
St Vincent's Hospital &
The University of Melbourne

Dr Rong Chen was awarded a MAWA Fellowship for his project which used computational tools to replace animal testing for studying ion channels that are directly or indirectly responsible for causing autoimmune diseases, such as multiple sclerosis, arthritis, and chronic heart diseases and to develop drugs to combat these diseases.

Dr Andre Peterson has been awarded a MAWA Fellowship for his project to investigate epilepsy from a neuronal modelling perspective as a viable replacement to animal models. A novel multi-disciplinary approach will utilise complementary methods including a mathematical model combined with voluntary human data.

COMPUTATIONAL BIOPHYSICS



Dr Rong Chen
Research School of Biology
The Australian National University