MEDIA RELEASE

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AUSTRALIAN MUSEUM EUREKA PRIZES 2021

SCIENTISTS PAVE THE WAY FOR A BRIGHTER FUTURE IN RESEARCH & INNOVATION CATEGORY AT 2021 AUSTRALIAN MUSEUM EUREKA PRIZES

From revolutionary medical advancements to discoveries with global impact, scientists are building a better world in the Research and Innovation category at Australia's leading science awards

Sydney, 2 September 2021: The **Australian Museum** (AM) today announced the 21 finalists selected in the Research and Innovation category at Australia's leading science awards, the **2021 Australian Museum Eureka Prizes**.

With seven AM Eureka Prizes in Research and Innovation, this category highlights the most ground-breaking developments in Australian science. Prominent themes in the category this year include innovations in medicine and life-saving research making a global impact.

Highlights of finalists from the Research and Innovation category include:

- **World Mosquito Program**, for delivering an international research program that demonstrated the insect bacterium *Wolbachia* is a safe and highly efficacious intervention against dengue, currently responsible for 390 million infections per year around the globe;

- **Professor Julie Bines,** who has led development of the novel human neonatal rotavirus vaccine from laboratory to commercial manufacture, a critical advance to tackle rotavirus globally, which causes 215,000 child deaths annually;

- **Associate Professor Diane McDougald and Dr Gustavo Espinoza Vergara**, for discovering that the bacteria responsible for cholera become more virulent when passaging through a previously unknown vector who transmits the bacteria through water. This discovery creates new opportunity to purify water supplies of waterborne bacterial pathogens – improving conditions for up to 2 billion people who only have access to contaminated water.

- **The Carbon Cybernetics Group**, who have discovered a way of building a revolutionary two-way brain-machine interface to treat epilepsy and restore vision using the unique properties of diamond and carbon fibres.

Australian Museum Eureka Prizes
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- **Team Chimera** discovered that a benign virus infecting Australian mosquitoes holds the key to accelerating viral research and paving the way to designing new vaccines, diagnostic approaches and antiviral drugs. Mosquito-borne flavivirus infections are a significant global health challenge, with dengue alone causing 400 million infections per year.

- **Professor Justin Gooding, Professor Maria Kavallaris AM, Dr Julio Ribeiro, Dr Aidan O'Mahony, Dr Robert Utama and Dr Lakmali Atapattu**, who have developed a breakthrough 3D bioprinting system that can rapidly produce 3D cell structures with unprecedented cell viability; a game-changer for cancer research and therapeutic development.

Known as the 'Oscars' of Australian science, the AM Eureka Prizes offer $160,000 in prize money, across a broad spectrum of research from environmental to innovative technologies, defence and mentoring.

The AM Eureka Prizes winners will be announced on **Thursday 7 October** at a live broadcast event. The event will be open to all audiences and free to stream online. Register to attend at australian.museum/eurekaprizes.

THE 2021 AUSTRALIAN MUSEUM EUREKA PRIZE FINALISTS IN RESEARCH & INNOVATION ARE:

NSW Environment, Energy and Science (DPIE) Eureka Prize for Applied Environmental Research

Coral Nurture Program, University of Technology Sydney and Wavelength Reef Cruises
In a world-first, scientists are partnering with local tourism operators to implement a coral restoration project that is reaping benefits for the Great Barrier Reef and communities that rely on it. Since 2018, the Coral Nurture Program has undertaken widespread coral planting to boost the health of local reef sites and introduced a new industry model for stewardship.

FutureFeed, FutureFeed; CSIRO; James Cook University; and Meat and Livestock Australia
Ruminants, such as cattle and sheep, are responsible for a large proportion of agricultural greenhouse gas emissions in the form of methane. A natural feed ingredient made from seaweed, FutureFeed, is significantly reducing methane contributions from red meat and dairy livestock while simultaneously increasing sector productivity, offering a solution to two major global challenges: climate change and hunger.

NSW Bushfire Hub, University of Wollongong; Western Sydney University; University of Tasmania; and UNSW
The NSW Bushfire Hub, a consortium of four research groups, undertook extensive research into the devastating Black Summer bushfires. Their findings addressed major knowledge gaps relating to droughts, fuel dynamics, and the social and environmental impacts of the fires — directly influencing many of the NSW Bushfire Inquiry recommendations and setting the future direction for fire management.

Eureka Prize for Excellence in Interdisciplinary Scientific Research

Lindell Bromham, Felicity Meakins, Xia Hua and Cassandra Algy, Australian National University; University of Queensland; and Karungkarni Art and Culture Aboriginal Corporation
Bringing together an Indigenous community member, linguist, mathematician and biologist, this team is studying Gurindji, an Indigenous language of northern Australia. Their research is developing new ways to understand the processes of language change and factors that help keep Indigenous languages strong and vibrant.

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The Carbon Cybernetics Group, University of Melbourne; St Vincent's Hospital; National Vision Research Institute; Carbon Cybernetics; and RMIT University
The Carbon Cybernetics Group is dedicated to finding a functional cure for epilepsy. Using the unique properties of diamond and carbon fibres, the team is developing a miniaturised neural implant capable of predicting and stopping seizures — world-first technology that is giving real hope to people living with epilepsy.

U-Breathe, UNSW
Early in the COVID-19 pandemic, this multidisciplinary team of medical experts, engineers and scientists disproved long-held ideology on droplet transmission. They have successfully visualised aerosol flow, demonstrating greater variability in human respiratory aerosol dynamics than previously understood and laying the groundwork for development of high-performing cloth masks.

Australian Infectious Diseases Research Centre Eureka Prize for Infectious Diseases Research

Professor Julie Bines, Murdoch Children's Research Institute and University of Melbourne
Rotavirus is a major cause of death among children and despite evidence of vaccine effectiveness, significant barriers to access remain. Professor Julie Bines is leading the development of RV3-BB, a safe, effective and affordable newborn rotavirus vaccine that will prevent rotavirus gastroenteritis from birth, potentially saving thousands of lives.

Doherty COVID Immunity Group, University of Melbourne and Royal Melbourne Hospital, Doherty Institute
First to report on immune responses to COVID-19, the Doherty COVID Immunity Group is at the forefront of coronavirus pandemic research. Using biological samples collected by rapid detection platform SETREP-ID, their work has accelerated global immune research and underpinned further study on immune dysfunction in severe cases of COVID-19.

World Mosquito Program Impact Assessment Team, Monash University
Dengue is a major public health problem in tropical regions that conventional approaches to reducing mosquito populations have been unable to control. The World Mosquito Program Impact Assessment team has led epidemiological field trials that demonstrate the efficacy of a sustainable method for controlling dengue by releasing mosquitoes infected with the insect bacterium Wolbachia.

ANSTO Eureka Prize for Innovative Use of Technology

Professor Justin Gooding, Professor Maria Kavallaris AM, Dr Julio Ribeiro, Dr Aidan O'Mahony, Dr Robert Utama and Dr Lakmali Atapattu, UNSW; Australian Centre for NanoMedicine; Children's Cancer Institute; and Inventia Life Science Pty Ltd
While 3D cell culturing offers vastly enhanced models of cell structures than 2D methods, it remains slow and expensive. This team has developed a breakthrough bioprinting system that can rapidly produce 3D cell structures with unprecedented cell viability and tunability — a game-changer for cancer research and therapeutic development.

Membrane Team, Monash University; RMIT University; University of Texas and CSIRO
Global demand for lithium has increased dramatically over the past decade, but current extraction methods are time-consuming and require large amounts of harmful chemicals. The Membrane Team has developed a controlled filtration technology that can separate lithium from other unwanted impurities with remarkable precision, heralding a new era in sustainable battery production.

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Team Chimera, University of Queensland; Monash University; and QIMR Berghofer Medical Research Institute
Mosquito-borne flavivirus infections are a significant global health challenge, with dengue alone causing 400 million infections per year. Team Chimera discovered that a benign virus infecting Australian mosquitoes holds the key to accelerating viral research and paving the way to designing new vaccines, diagnostic approaches and antiviral drugs.

Macquarie University Eureka Prize for Outstanding Early Career Researcher

Dr Emma Camp, University of Technology Sydney
Dr Emma Camp's discovery of corals thriving in extreme conditions is informing new adaptive management solutions in both Australia and abroad. Together with government and nature conservation agencies, she is developing improved management strategies for coral reefs worldwide, while using her work as a platform to advocate for action on climate change.

Associate Professor Rona Chandrawati, UNSW
Associate Professor Rona Chandrawati is a prominent researcher in colourimetric polymer sensor technology and a rising leader in the field of nanozyme development for drug delivery. Her innovative research has already found widespread application in areas including food safety, disease diagnosis and the treatment of glaucoma.

Dr Tess Reynolds, University of Sydney
As high-quality imaging becomes increasingly commonplace in medical diagnosis and treatment, so does the demand for minimally invasive procedures. Dr Tess Reynolds has developed ACROBEAT, a new technology that enables imaging and treatment hardware to operate in sync with the patient, delivering clearer, faster and safer medical images.

Department of Defence Eureka Prize for Outstanding Science in Safeguarding Australia

Cross Domain Desktop Compositor, University of Melbourne; Defence Science and Technology Group; UNSW; and CSIRO's Data61
Simple, secure and trustworthy: easy to say, but often difficult to achieve. By combining a world-class secure operating system with novel hardware architecture, the Cross Domain Desktop Compositor team has defied the trend of increasing complexity in computing technologies to enable a new method for keeping sensitive information secure from internet attacks.

FOWI Work Systems Design Team, Curtin University
While the future Attack Class Submarines promise to deliver enhanced endurance and expanded capabilities, the design and build of these vessels involves significant technical, human and social challenges. Research undertaken by the FOWI Work Systems Design Team is driving the development of new systems that will optimise crew endurance, supporting future submariners to perform at high standards.

Strong Bond, Western Sydney University; and Defence Science and Technology Group
Using innovative nanotechnology, the Strong Bond team has developed a high-performance nanocomposite adhesive that has significant implications for national security capabilities. This durable material enables rapid patch repairs of military infrastructure and can also improve the resilience of structural joints and laminated composites used in a range of defence platforms.

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UNSW Eureka Prize for Scientific Research

Professor Anita Ho-Baillie, Dr Martin Bucknall and Dr Lei Shi, University of Sydney and UNSW
Solar cells are traditionally made of silicon, but metal halide perovskites are emerging as the new class of solar material. Inexpensive, efficient and versatile, they are also prone to damage from heat and humidity — a limitation that has been successfully addressed by Professor Anita Ho-Baillie and her team. Their game-changing research represents an important step towards commercial viability of perovskite solar cells.

Associate Professor Diane McDougald and Dr Gustavo Espinoza Vergara, University of Technology Sydney
Associate Professor Diane McDougald and Dr Gustavo Espinoza-Vergara discovered that the bacterium responsible for cholera, Vibrio cholerae, becomes more virulent when passaging through a previously unknown vector. Their finding reveals where pathogenic bacteria hide before causing infectious disease outbreaks, which will have wide-ranging impacts on the development of control strategies.

Professor Justin J. Yerbury AM, University of Wollongong
Motor neuron disease (MND) was discovered more than a century ago, yet there is still no effective treatment. Research led by Professor Justin J. Yerbury has demonstrated that protein deposits found in motor neurons, the pathological hallmark of MND, result from dysfunction in a process known as protein homeostasis. This is a breakthrough discovery that is informing the search for new therapies.

EVENT DETAILS
What: Australian Museum Eureka Prizes Winners Announcement
When: 7pm, Thursday 7 October 2021
Where: australian.museum/eurekaprizes

For more information and a full list of 2021 Australian Museum Eureka Prizes finalists: australian.museum/eurekaprizes

Eureka Prize Press Pack and Images Available HERE

SOCIAL MEDIA: #EurekaPrizes
Twitter: @eurekaprizes **Facebook**: @eurekaprizes

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About the Australian Museum
The Australian Museum (AM) was founded in 1827 and is the nation's first museum. It is internationally recognised as a natural science and culture institution focused on Australia and the Pacific. The AM's mission is to ignite wonder, inspire debate and drive change. The AM's vision is to be a leading voice for the richness of life, the Earth and culture in Australia and the Pacific. The AM commits to transforming the conversation around climate change, the environment and wildlife conservation; to being a strong advocate for First Nations cultures; and to continuing to develop world-leading science, collections, exhibitions and education programs. With more than 21.9 million objects and specimens and the Australian Museum Research Institute (AMRI), the AM is not only a dynamic source of reliable scientific information on some of the most pressing environmental and social challenges facing our region, but also an important site of cultural exchange and learning.

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