

# CSIRO Health and Biosecurity

We focus on major national and international challenges in health and biosecurity - to give Australia a sustainable, prepared and responsive one-Health system.

Australia's enviable health and biosecurity system is increasingly under threat through growing global connections, change and social complexities which collectively bring acute health and biosecurity challenges for our people, agriculture and food industries, the environment, and healthcare systems.

Health and Biosecurity is working with CSIRO's Australian Animal Health Laboratory (AAHL) in addressing these challenges under the banner of one-Health – the integration of multiple disciplines working to achieve optimal health for people, animals, plants, the economy and environment.

Overall, we aim for a one-Health system that is sustainable, pre-emptive, responsive, resilient, and based on cutting edge informatics, surveillance, and new technologies for integrated services and responses.

## Our research programs

We assemble strong multi-disciplinary teams focused on our customers' needs across government, industry and community to provide solutions for complex health issues and biosecurity challenges for Australia.

Through our Programs, in collaboration with AAHL, we bring together unique and world leading health and biosecurity capability, infrastructure and innovation from across CSIRO:

1. **e-Health** – we transform the health system through the delivery of digital health and productivity tools to improve decision support and operational efficiency; new insights from biomedical imaging and genomics; and improve access for all Australians to health services through broadband and mobile communications.
2. **Combating Emerging Infectious Diseases** – we partner with industry and the public health system to help protect Australia from infectious disease threats through the deployment of innovative early detection systems, novel vaccines and anti-viral drugs and appropriate animal models to allow rapid approval and deployment of countermeasures.
3. **Risk Evaluation and Preparedness** – we develop more effective surveillance and response tools, apply new genomic and RNA technologies and build greater wellbeing and resilience in communities to the impact

of pest and disease outbreaks to reduce the likelihood of adverse events, to minimise their impacts and achieve faster recovery.

4. **Managing Invasive Species Impacts** – we deliver new approaches to reducing impacts of invasive plants, invertebrates, vertebrates and diseases underpinned by broad capability in the biological, mathematical, economics and social sciences for generating measurable social, economic and environmental impacts.



*We're identifying the risks and developing intervention solutions to mitigate mosquito borne diseases and help safeguard Australia.*

## Our Advisory Committee

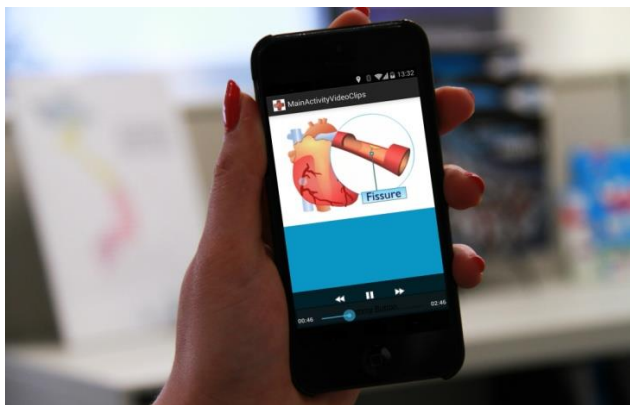
Providing advice and insights across sectors where we deliver impact.

- Ms Kathleen Plowman (Chair), Chief Executive Officer, Animal Health Australia
- Dr Charles Milne, Chief Veterinary Officer, Victoria
- Dr Gary Lum, Specialist Medical Advisor, Office of Health Protection, Department of Health
- Mr Greg Fraser, Chief Executive Officer, Plant Health Australia
- Dr Jim Thompson, Chief Biosecurity Officer, QLD Department of Agriculture and Fisheries
- Mr Johann van der Merwe, Gorgon Quarantine Manager, Chevron Australia Pty Ltd
- Dr Kim Ritman, Chief Scientist and Chief Plant Protection Officer, Department of Agriculture
- Dr Bruce Christie, Deputy Director General, Biosecurity and Food Safety, NSW DPI

## Our Impact

### Smartphone app a lifesaver for cardiac patients

We've developed and trialled an online cardiac rehabilitation program that improves program completion rates and patient health outcomes. With more than \$5.5 billion spent every year on acute and chronic management of heart disease, our technology also has huge potential to reduce the burden and cost to the community.



*Patients who used the Smartphone app were almost 30 per cent more likely to take part in rehab.*

### Australian e-Health Research Centre (AEHRC)

The AEHRC is the leading national research facility applying information and communication technology to improve health services and clinical treatment for Australians. It is a joint venture between CSIRO and the Queensland Government, through Queensland Health.

### Finding solutions to Foot and Mouth Disease (FMD)

Just one case of FMD in Australia would have dire consequences for our livestock industries, trade and economy. We're preparing for a potential outbreak by evaluating vaccines, diagnostic tests and control strategies. Our work is informing policy and is assisting in enhancing Australia's ability to respond to an FMD outbreak.

### Enhanced vaccine technology

Global pharmaceutical industries produce seasonal flu vaccines in eggs. In the event of an influenza pandemic, speed of vaccine supply is the most critical factor in protecting the population. The problem is eggs have a limited capacity to produce vaccine virus and the number of eggs required to rapidly produce sufficient vaccine doses is overwhelming. Our approach will use the advances in genome engineering technology to develop enhanced chicken eggs for improved influenza vaccine production. This approach will potentially help to combat

the impact of seasonal influenza and increase preparedness for the eventuality of pandemics or bioterrorist threats.

### Protecting human and animal health from mosquitoes

The emergence and spread of insect (vector)-borne diseases poses a risk to public health, livestock production and Australia's live export trade. We're identifying the risks and developing intervention solutions to help safeguard Australia.

### Keeping our honey bees healthy

Exotic pests and diseases pose a significant threat to honey bee health. We're focusing on these potential risks and ways to avoid their detrimental impact on agricultural industries that rely on honey bees for pollination. In August 2015 we launched the Global Initiative for Honey bee Health – an international collaboration of researchers, beekeepers, farmers, industry, and technology companies aimed at better understanding what is harming bees and finding solutions to help secure crop pollination and hence food security.

### Biological control for widespread invasive alien species

Australia's "ferals" — invasive alien weeds, pests and diseases — have massive impacts on Australian agriculture and the environment. CSIRO supports core national capability and infrastructure which has already generated huge benefits suppressing existing major pests of agriculture and the environment including bush flies, rabbits, silverleaf whitefly, weeds like skeleton weed, Salvinia fern, Paterson's curse and bridal creeper.



*We've tested and have now released a Mexican rust fungus in Australia for the biocontrol of Crofton weed.*

We continue to provide invasive species solutions through applying new techniques and multi-disciplinary science for industry and government by working to reduce their costs and impacts.

#### CONTACT US

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#### AT CSIRO WE SHAPE THE FUTURE

We do this by using science to solve real issues. Our research makes a difference to industry, people and the planet.

#### FOR FURTHER INFORMATION

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