Tasmanian and Antarctic
One Health Conference Programme

25th of November 2024

Aurora Lecture Theatre

Institute for Marine and Antarctic Studies

The University of Tasmania

We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture.

With thanks to our sponsors: Australian Society for Parasitology, the Antarctic and Southern Ocean Mission Integrator and the University of Tasmania for funding/supporting this event.

Conference Agenda

	Welcome
8:55 – 9.05	**Welcome and introduction/ Acknowledgement of country**
9:05 – 9:20	**Opening address** **Vice Chancellor Rufus Black**
	Keynote address
9.20 – 10:00	*What can we do in an apocalyptic world for wildlife and one health?* **Lee Skerratt, One Health Research Group Lead, University of Melbourne.**
	Session 1 Presentations
10:00– 10:15	*One Health for Antarctica* **Jane Younger, Institute for Marine and Antarctic Studies, UTAS**
10.15– 10:35	*Don't forget the Bacteria!* **Lou Cooley Director of Microbiology and Infectious Diseases, Royal Hobart Hospital**
10.35– 10.40	*Islands as One Health laboratories* **Nick Fountain-Jones, School of Natural Sciences, UTAS**
10.40–10:50	Panel (10 mins) **Jia Huan Liew School of Natural Sciences, UTAS (moderator)**
10:50-11:15	**Morning tea**
	Session 2 Presentations
11:15-11.30	*Tasmanian public health experiences of One Health* **Mark Veitch, Director of Public Health Tasmania**
11.30-11.45 (virtual)	*More than meets the eyes: repeated introductions, widespread circulation and species-specific response to H5Nx avian influenza on a subantarctic archipelago*. **Amadine Gamble, Cornell University**
11:45-12.00	*Tasmania's preparation for H5Nx avian influenza* **Sarah Michael & Emma Watson, Department of Natural Resources and Environment Tasmania**
12.00-12.05	*Australia's preparation for H5Nx avian influenza.* **Anna Kabaila, Director of Biosecurity Strategy at the Department of Agriculture, Fisheries and Forestry**
12.05 – 12.20	*Tuberculosis testing in primates in African sanctuaries – the challenge test prior to release primates back into the wild* **Alexandre Kreiss, Menzies Institute for Medical Research, UTAS**
12.20-12.30	Panel discussion **Kate Hutson, Cawthon Institute, New Zealand (moderator)**
12.30-1:30	**Lunch**

	Session 3 Presentations
1.30-1.45	*Assigning cause for emerging diseases of aquatic organisms*. **Kate Hutson, Cawthron Institute, New Zealand.**
1.45-1.50	Anisakis *& co – the rise in human cases is a consequence of random coincidence, better diagnostics, protection of marine mammals, or all of the above?* **Ivona Mladineo, Institute for Marine and Antarctic Studies, UTAS.**
1.50-2.05	*What mixed methods are telling us about the shared health between people and environments* **Emily Flies Geography, Planning, and Spatial Sciences, UTAS**
2.05-2.15	*Isolation, Mental Health, and a Guy Called Jeff*. **Vini Drozdowski, College of Arts Law & Education, UTAS**
2.15-2.25	**Panel discussion** **Moderator: Jane Younger, Institute for Marine and Antarctic Studies, UTAS.**
	Session 4 Rapid talks (questions at the end)
2.25-2:30	*Reproductive effects of a novel recombinant gonadotropin-releasing Hormone-1 vaccine in Formosan sika deer* **Ai-Mei Chang Menzies Institute for Medical Research, UTAS**
2.30-2.35	*A national collaboration to build our knowledge of* Vibrio parahaemolyticus *in Australia* **Alison Turnbull and Claire Hedges, Institute for Marine and Antarctic Studies, UTAS.**
2:35-2.40	*Reflections on the 50th Anniversary of The Green Book and Insights into Foodborne Parasites* **Silvan Betiol, Tasmanian School of Medicine, UTAS**
2.45-2.50	Panel discussion **Moderator: Jane Younger, Institute for Marine and Antarctic Studies, UTAS.**
2.50: 3.00	*Join the Australian Society for Parasitology!* **Kate Hutson (ASP Tasmanian Council Representative)**
3.00-3.30	**Afternoon tea**
	Session 5: Break-out groups
3.30-4.30	Horizon scan – breakout groups by One Health Silo. How can we leverage islands as One Health Laboratories? **Moderator: Nick Fountain-Jones**
4.30-4.45	**Closing address**
6.00pm	**Post conference celebration Boodle Beasley**

Abstracts (in order of presentations). Presenter is in bold.

Keynote: What can we do in an apocalyptic world for wildlife and one health?

Lee Skerratt

The University of Melbourne

For the environment, wildlife and some people, things are only going to get worse in the immediate future. As we struggle to mitigate the underlying drivers of environmental change impacting wildlife and people, globalisation, habitat loss, global warming and pollution, is there more that we could do to lessen their impact on biodiversity and us? Employing biosecurity and emergency responses have helped but there are large opportunities for improvement. Most of the crises precipitated have huge uncertainty, and research coupled with adaptive management can lead to better outcomes and reduce adverse impacts. The One Health Research Group has been working with wildlife managers to apply one health approaches to major wildlife health issues such as emergency wildlife diseases and events to provide solutions and the necessary capacity and engagement to do more than just document disasters but prevent, prepare and respond for the benefit of wildlife and people.

One Health for Antarctica

Jane Younger

The University of Tasmania

The One Health approach, which emphasises the interlinked health of people, animals, and ecosystems, provides an opportunity for safeguarding Antarctica's vulnerable environment. This talk examines how One Health principles could elevate our readiness for and response to emerging health threats in this region. The ongoing avian influenza panzootic, which is driving significant mortality in Antarctic seabirds and pinnipeds, highlights the urgent need for real-time disease surveillance, baseline data, preventive actions, and cross-disciplinary collaboration. By proactively integrating human, animal, and ecosystem health, One Health provides a vital, adaptable framework to protect Antarctica's unique ecosystems amid intensifying global pressures.

Islands as One Health laboratories

Nick Fountain-Jones

School of Natural Sciences, UTAS

Islands play a central role in understanding the ecological and evolutionary processes that shape life but are rarely used to untangle the processes that shape human, animal, and environmental health. Islands, with their discrete human and animal populations, and often well-studied ecological networks, serve as ideal natural laboratories for exploring the complex relationships that shape health across biomes. Relatively long coastlines and, in some cases, low lying topography also make islands sentinels for climate change. In this article, we examine the potential of islands as valuable laboratories and research locations for understanding the One Health nexus. By delving into the challenges faced in island settings, we provide valuable insights for researchers and policymakers aiming to globally promote and apply One Health principles. Ultimately, recognizing the interconnected health of humans, animals, and the environment on islands contributes to efforts aimed at promoting global health and sustainability.

More than meet the eyes: repeated introductions, wide-spread circulation and species-specific responses to H5Nx avian influenza on a Subantarctic archipelago

Augustin Clessin 1, Julia Emerit 2, Mathilde Lejeune 1, Francois-Xavier Briand 3, Dina M. Alter 2, Beatrice Grasland 3, Thierry Boulinier 1, Amanda Kuepfer 4, Zoe Fowler 5, **Amandine Gamble** 1

1 Centre d'Ecologie Fonctionnelle et Evolutive, UMR 5175, Université Montpellier, CNRS, EPHE, IRD, Montpellier, France

2 Department of Public & Ecosystem Health, Cornell University, Ithaca, United States

3 Anses - French Agency for Food, Environmental and Occupational Health Safety, Ploufragan-Plouzané Laboratory, Avian and Rabbit Virology, Immunology, and Parasitology Unit, Ploufragan, France

4 Falklands Conservation, Stanley, Falkland Islands

5 Falkland Islands Government, Stanley, Falkland Islands

Seabirds, which breed in dense colonies in which viruses can quickly spread, have been particularly affected by the recent highly pathogenic avian influenza (HPAI) panzootic. In October 2023, the virus reached Subantarctica. Subsequently, several HPAI outbreaks, mostly affecting penguins and albatrosses, were reported in the Falkland Islands. In parallel with intense mortality event surveillance, systematic sampling of both dead and live birds from 14 species allowed us to obtain new insights on the mechanisms driving HPAI transmission in seabird communities.

Immunological data suggest an earlier introduction and wider transmission than graspable with symptomatic case detection only, highlighting the potential importance of asymptomatic carriers. This was then confirmed by viral RNA direction in 7 species, including 4 species for which no unusual mortality event had been reported. Together, these data revealed that apex scavengers can survive infection and acquire immunity against the virus. On the contrary, meso-predators like penguins and albatrosses likely remain infected a few days and die before developing any immunity. Viral sequences suggest several introduction events from South America, followed by intense cross-species transmission, notably between preys and predators, but low probability of outbreak initiation, all together pointing towards at-sea scavenging as a key spread mechanism.

This study highlights the need for systematic sampling of both live and dead animals, and affected and (apparently) non affected species to better understand HPAI dynamics. It also showcases successful community-led wildlife health monitoring and collaborative research on wildlife disease, involving local populations, local governmental and non-governmental organizations, and international research teams.

Tuberculosis testing in primates in African sanctuaries – the challenge test prior to release primates back into the wild

Alexandre Kreiss

Several conditions, stipulated by the IUCN, must be met for rehabilitated primates to be released back into the wild. One of them is the clearance of tuberculosis (Tb), with several negative tests prior to the reintroduction.

Tuberculosis is an insidious disease, and animals do not show symptoms until the disease is advanced. Several tests exist for Tb, but all tests have relative low sensitivity and specificity, therefore a combination of tests must be performed to increase the confidence of the results.

This talk will highlight the tests performed in primates in a sanctuary in Cameroon, and the difficulties of sourcing local laboratories and resources to meet the IUCN requirements.

Reflections on the 50th Anniversary of The Green Book and Insights into Foodborne Parasites

Silvana Bettiol

Foodborne Microorganisms of Public Health Significance, also known as The Green Book, celebrates its 50th anniversary as a seminal text in food science and technology education in Australia. This essential resource has evolved to embody a One Health approach, integrating human, animal, and environmental health perspectives to address complex food safety challenges across sectors. With an expanded scope that includes emergent pathogens, antimicrobial resistance, and food parasitology, the Green Book reflects the pressing need for systems-based public health approaches that consider the interconnectedness of ecosystems, agriculture, and human health.

This presentation honours the contributions of over 80 authors from across Australia and provides an overview of our chapter on foodborne parasites. The chapter explores the diverse transmission pathways of these parasites, covering both direct and indirect life cycles. It discusses transmission risks posed by food handlers, contaminated intermediate hosts, and consumption practices, categorising key parasites—protozoa, flukes, tapeworms, and roundworms—by their life cycles and ecological roles. Through its comprehensive and evolving approach, the Green Book remains an indispensable resource for advancing food safety and public health practices worldwide.

Assigning cause for emerging diseases of aquatic organisms

Kate Hutson

Cawthron Institute, Nelson, New Zealand

Harmful aquatic diseases have a legacy of destructive impact on marine and freshwater animals and plants. In New Zealand, aquatic disease investigations have doubled in the past five years, and most take years to solve, or are never resolved. This fundamental diagnostic shortfall undermines all disease management efforts, jeopardises the ~$3B economic value of NZ fisheries and aquaculture, and cause immeasurable social/cultural impacts.

Cawthron's *Emerging Aquatic Disease* programme will develop and implement innovative diagnostic methods and a new disease investigation pipeline to overcome longstanding challenges of aquatic disease correlation versus causation. We will tackle critical bottlenecks in three sequential steps of disease investigations including: forecasting & incident reporting, short-Listing suspects and assigning causation. New methods will be developed to culture as-yet-uncultured infectious agents that pose high risk of emergence, enabling culture-dependent whole-animal challenge methods. Novel cell-lines will provide high-throughput bioassay systems. Activities leverage Cawthron's recent investment in a new-for-NZ aquatic biocontainment facility.

Outcomes of the research will be critical new diagnostic resources that will be integrated within national disease investigation standards for faster diagnosis of future disease incidents. This includes tools and guidelines for a broad range of aquatic taxa, a large and diverse biobank, streamlined reporting and data management, and decision-support tools. The programme unites leading NZ and Australian scientific expertise and social science alongside mana whenua and government stakeholders. With our stakeholders we will build an interconnected method pipeline and social framework that translates scientific findings into lasting benefit for actionable conservation, fisheries, and aquaculture management.

Anisakis & co - the rise in human cases is a consequence of random coincidence, better diagnostics, protection of marine mammals, or all of the above?

Ivona Mladineo

IMAS, UTAS, Taroona, TAS

ivona.mladineo@utas.edu.au

Anisakiasis and anisakidosis are two clinical diseases in humans caused by ingestion of viable third-stage larvae (L3) of nematodes A. simplex sensu stricto (s.s.) and A. pegreffii in case of the former, and ingestion of Phocanema decipiens sensu lato and Contracaecum osculatum sensu lato larvae in case of the latter. In the last decade, anisakiasis in particular, has shown an increasing trend in countries with high per capita fish consumption. The infection has been related to a higher consumption of contaminated raw or undercooked fish and cephalopods (serving as intermediate hosts), facilitated by new culinary trends, especially the expansion of Asian-style dishes. However, due to an unspecific and transient symptomatology, and lack of official reporting of the disease, most cases undergo undiagnosed, misdiagnosed or unreported. In addition, repeated exposure to anisakid allergens has contributed to the development of Anisakis-IgM positive asymptomatic population that may result in hypersensitised patients exhibiting clear allergic reactions.

While the shift in culinary trends has been associated to insurgence of human cases, other drivers have been suggested to contribute to increased anisakiasis/ anisakidosis incidence: the increase in population of marine mammals (serving as the final hosts) as a consequence of conservation efforts; practice of Mediterranean fishermen to eviscerate onboard some fish species that exhibit high anisakid intensity (e.g., Merluccius merluccius, Merlangius merlangus) and throw the parasitised viscera back in the sea; extension of anisakids habitat towards polar extremes likely facilitated by increased water temperature; and development and less restricted availability of non-invasive diagnostic tools, including MR, endoscopy, serological and molecular identification. However, it still needs to be proved the exact range of these drivers on Anisakis epidemiology and if significant, devise mitigation measures aligned to One Health strategy.

Reproductive effects of a novel recombinant gonadotropin-releasing Hormone-1 vaccine in Formosan sika deer (*Cervus nippon taiouanus*)

Ai-Mei Chang[12], Jai-Wei Lee[4], Chen-Chih Chen[*23]

[1] Menzies Institute for Medical Research, College of Health and Medicine, University of Tasmania, Hobart, 7000 Australia.

[2] Institute of Wildlife Conservation, College of Veterinary Medicine, National Pingtung University of Science and Technology

[3] Department of Veterinary Medicine, College of Veterinary Medicine, National Pingtung University of Science and Technology,

[4] Department of tropical Agriculture and International Cooperation, International College, National Pingtung University of Science and Technology, Pingtung, Taiwan; 1 Shuefu Road, Neipu, Pingtung, 91201, Taiwan.

*Correspondence: (C-C.C).

The Formosan sika deer (*Cervus nippon taiouanus*) is an endemic subspecies of sika deer in Taiwan. In the absence of natural predators, the population has rapidly grown, leading to increased human-

wildlife conflicts. Due to concerns over animal welfare and public safety, there is increasing demand for non-lethal control methods. Immunocastration, such as using the GnRH vaccine, offers a potential alternative for fertility control. In this study, we evaluated the effectiveness of a recombinant subunit GnRH-1 vaccine for immunocastration in 11 vaccinated sika deer, compared with a control group over a 6-month period (total = 22, 6 males and 16 females). All deer were clinically normal both before and during the experiment. Specific anti-GnRH immune responses were detected by Week 4 and persisted for at least 24 weeks post-vaccination in serum samples. We also observed significantly reduced levels of sex hormones, including testosterone and progesterone, along with a reduction in testis size and abnormal antler development in male deer in the vaccinated group. Our findings strongly support the efficacy of the recombinant subunit GnRH-1 vaccine as a viable tool for managing sika deer populations non-lethally, offering an effective solution for reducing reproductive rates and mitigating human-wildlife conflicts in Taiwan.

Keywords: Formosan sika deer, GnRH vaccine, Immunocastration, Population control.

A national collaboration to build our knowledge of *Vibrio parahaemolyticus* in Australia

Claire Hedges[1, 2], Alison Turnbull[1, 2]

1. Institute of Marine and Antarctic Studies, University of Tasmania.

2. Seafood Safety and Market Access Program, SafeFish

Vibrio parahaemolyticus is a marine bacterium that can cause vibriosis in humans following the consumption of contaminated seafood. There have been 6 outbreaks involving *V. parahaemolyticus* in Australia since 2016, following an international trend of increasing illnesses. In Australia, *V. parahaemolyticus* isn't a nationally notifiable pathogen so existing data is limited. A national collaboration has been initiated, bringing together researchers and government organisations in the food, environment and health space to enhance our knowledge of this bacteria using whole genome sequencing.

Join the Australian Society for Parasitology!

Kate Hutson

ASP Tasmanian Council Representative

The Australian Society for Parasitology brings together all those in Australia (and in many other countries) interested in parasites and parasitic diseases of humans and animals. The Society is active in all aspects of the science of parasitology and in education and lobbying for parasitological issues. Come and hear about the history of the society, current activities and events, and the benefits of becoming a member.