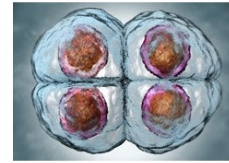


[View this email in your browser](#)



Reproductive Health Australia is a unified voice for Australian researchers in reproduction, advocating directly to the community, opinion leaders and the Government on behalf of the entire sector



Dr Kiri Beilby and Ms Nicole Rivers represented RHA at Science meets Parliament 2019 where they were able to meet with parliamentarians and inform them of benefits of Australian reproductive research and how RHA can support their need for evidence-based information .

Convenor's Corner

Dear RHA Member,

Welcome to our second Newsletter. RHA is now just over one year young and we continue to grow and make progress.

Earlier this year we contacted Federal parliamentarians, particularly Ministers and Shadow ministers, to tell them about RHA. We explained how RHA advocates for reproductive sciences in all fields and how evidence-based information in reproduction is essential to inform policy development across a range of areas. We have also been in contact with influential community leaders who may be interested in becoming RHA Community Champions.

Other notable achievements have been

- Membership of Science & Technology Australia [STA]
- A well-attended session at the recent Society for Reproductive Biology meeting in Sydney on "What can RHA do for you?"
- RHA is now on Twitter – see us on **@RepHealthOz**
- Our website is updated regularly with news from RHA and regular posts on the latest publications from Australian reproductive health researchers
- More than 220 Members

RHA Steering Group members recently published a review in the internationally peer-reviewed journal *Reproduction*. The article "*Reproductive science and the*

future of the planet” co-authored by Michael Holland, Bob Wong and myself, has received strong international interest. You can read it [here](#).

An important activity in November 2019 was “Science meets Parliament” in Canberra, where RHA had two fantastic representatives to advocate on our behalf. Dr Kiri Beilby and Ms Nicole Rivers were able to inform parliamentarians of the benefits of Australian reproductive research and how RHA can support their need for evidence-based information. See below for some advocacy tips to consider when meeting with politicians.

The first question often asked by parliamentarians and community leaders with whom we engage is “How big is RHA membership?” Our membership continues to grow but the more members we have, the stronger our voice, influence and impact.

We need more Members and more activities from our Members to spread the message.

If you know of a friend or colleague who is not yet a Member of RHA, please ask them to join as soon as possible. It’s FREE and takes moments to join – just go to the website, fill in a few boxes and then confirm your membership via your email. In return, we ask members to spread the advocacy word! If each Member introduced at least one other person to join RHA, we would have almost 500 members and our advocacy message would be greatly strengthened.

Another way to expand our advocacy message is through professional societies, organisations and institutions that will work with and promote RHA. Please let me know your favourite society and institution so that we can contact them. Alternatively, we are happy to help you do that!

As we head towards the end of another year, we would like to say a big thank you to our sponsors, who are listed on the RHA website, for supporting RHA for another year. They are the Biodiscovery Institute and the School of Biological Sciences at Monash University, the Robinson Research Institute, University of Adelaide, the Centre for Reproductive Health and the Hudson Institute of Medical Research, Healthy Male [formerly Andrology Australia] and a new sponsor, the Department of Obstetrics & Gynaecology, University of Melbourne.

We look forward to working with you to advocate for the enormous strengths and benefits of reproduction research in Australia.

Merry Christmas and Happy 2020!

Jock Findlay
RHA Founder & Convenor

Meeting a Politician? A Science Advocate’s Top Tips

- **Know your politician before you meet them.** Read their maiden speech as a minimum and you will learn a lot about their motivations and what’s

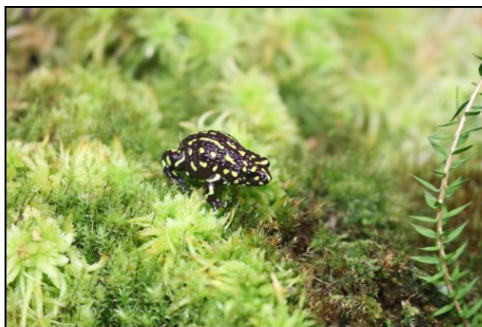
important to them.

- **Always ask them what you can do for them.** Stand in their shoes; hundreds of people tell them what they want from the government. But how can you help them achieve their legacy?
- **Never embarrass a politician.** You can't influence someone that won't talk to you. Praise them for what they have done and advocate for ways to improve policy. Always be respectful no matter what their political persuasion.
- **Never go to a meeting with a politician empty handed.** Leave them a one-page summary (dot points are ideal) of your key messages (substantiated with evidence where possible).
- **Leave the meeting with something to do;** a great opportunity to re-engage with them. They may ask you for further information. If they do, always follow through.
- **Ask for a photo and share positively on social media.** Works for them and for you.

For more information, see [here](#)

RHA can also help you by providing material and advice

Amphibian reproductive technologies: using hormone therapy and IVF to save endangered frogs



Australian researchers' quest to save the critically endangered Corroboree frog using ART.

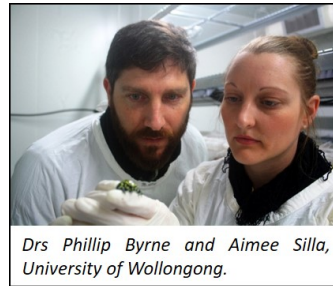
An interview with Drs Phillip Byrne and Aimee Silla, School of Atmospheric and Life Sciences, University of Wollongong, NSW.

Environmental change is responsible for unprecedented rates of species extinction, presenting a global threat to biodiversity. Although high extinction rates have been reported for all vertebrate classes,

amphibians have been most severely affected. Current estimates indicate that more than 40% of known amphibian species are threatened with extinction, with this global trend mirrored in Australia. In response to this amphibian extinction crisis, captive breeding programs have been established to preserve species diversity globally, with reproductive technologies being increasingly adopted to enhance the propagation and genetic management of threatened species.

Since 2011, the Evolution and Assisted Reproduction Lab at the University of Wollongong, headed by Associate Professor Phillip Byrne and Dr Aimee Silla, has focussed on developing innovative approaches to improve the reproductive output and genetic management of frogs in captivity. Building on a significant body of knowledge that Dr Silla acquired during her PhD at the University of Western Australia, with Dr Byrne's knowledge of evolutionary biology, these scientists have been devising ways to use hormone therapy to induce gamete release and achieve fertilisations using artificial fertilisation techniques. The

research program has been strategically developed in collaboration with the NSW Department of Planning, Industry and Environment (DPIE), Taronga Conservation Society Australia and Zoos Victoria to assist with the management of various endangered species, including the iconic and critically endangered Northern and Southern Corroboree frogs.



Drs Phillip Byrne and Aimee Silla, University of Wollongong.

The main goals of the Evolution and Assisted Reproduction Lab's research program are to: 1) develop hormone therapies to induce spawning (in breeding pairs of frogs), spermiation (sperm release) in males and ovulation (egg release) in females, 2) develop gamete-storage protocols to optimise gamete viability and longevity, 3) enhance the genetic management of targeted endangered species by developing innovative IVF techniques, and 4) assess the re-introduction success of individuals generated using reproductive technologies.

This work is the first in the world to combine molecular and IVF techniques to comprehensively investigate mechanisms underpinning genetic quality in amphibians. By identifying superior phenotypes and optimal genetic pairings, the team's research is expected to greatly improve the success of existing captive breeding programs, and assist with the protection of Australia's unique amphibian biodiversity.

The Placenta; a New Target for Treatment

An interview with Caitlyn Wyrwoll

"My fascination with reproductive biology started at 4 years of age when my mother was pregnant with my brother. She gave me a Women's Weekly magazine special which explained pregnancy and the images fascinated me. That probably influenced the development of imaging to answer my research questions".



Dr Caitlyn Wyrwoll

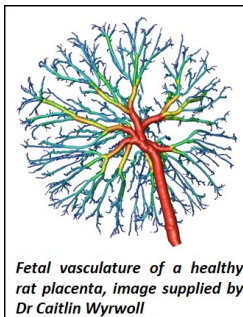
Dr Caitlyn Wyrwoll is a senior Lecturer in the School of Human Sciences at the University of Western Australia and leads a research group focused on placental development and its influence on the fetus and future health outcomes. Caitlin's work is ground breaking; she found a crucial role for the placenta, greater than was first thought, in influencing the baby's health and development throughout pregnancy. Her work may provide new ways to diagnose and treat babies at risk of diabetes, heart disease and stroke later in life. The work

has shown that when the placenta is exposed to a setting of excess glucocorticoid exposure, there is a direct impact on fetal brain and cardiovascular development which contributes to adverse health outcomes in later life. Her group uses experimental models of fetal growth restriction to assess the variation in 3D placental vascular structure across gestation and the implication this has for blood flow, placental biology and fetal outcomes. "This approach is setting a new and exciting direction for placental biology, which is also being applied to human placentas" Caitlin says, "None of this would have

been possible without a fantastic team of people; a diverse, multidisciplinary group of reproductive biologists, engineers, imaging specialists and computer scientists”.

‘It is really exciting!... it's invigorating to be involved in pushing a research field into a new direction”.

Caitlin says there are some big challenges to overcome in placental biology but the future also presents great opportunities for the field and for Australia. “There is so much more that needs to be revealed about placental biology to help better diagnose and potentially treat pregnancy complications. There's many exciting developments in imaging that will assist with this. In the context of early life origins of adult disease, the effects of climate change on reproductive function are going to have substantial impacts on human health outcomes, agriculture and conservation. If we can highlight and advocate for this in our field, hopefully this can lead to meaningful changes in policy”.



Fetal vasculature of a healthy rat placenta, image supplied by Dr Caitlin Wyrwoll

A role for reproductive technologies in restoring beef cattle numbers in Northern Australia after natural disasters such as drought or flood

Michael Holland, School of Veterinary Science, University of Queensland & Executive Champion of Agricultural Productivity, Reproductive Health Australia

The importance of the Northern beef industry

Australia has a national beef herd of 26.2 million cattle, of which 15.5 million are in Queensland, the Northern Territory and the Pilbara region of Western Australia. Australia has 2% of the World's cattle population but produces 3% of the World's beef. We each consume 26.2 kg of beef annually and we export 1.1 million tons to 78 countries so earning \$8 billion p.a. Over 191,800 people work in this industry as do many families. Thus, natural factors which adversely affect the beef industry such as drought, fire and flood have significant regional and national impact. In recovering from these natural disasters, one of the most difficult tasks is restocking to compensate for lost animals. If the disaster is sufficiently widespread, the number of animals for sale is low, especially when flooding due to cyclone activity is followed by drought. It is in these disaster situations as well as in normal breeding that reproductive technologies have an important role to play.

What can reproductive technologies do?

There are potentially two roles for assisted reproduction in the beef cattle industry. The first is a preventative role. Many producers in the North have developed blood lines in their cattle based on three or even four generations of genetic selection largely based on phenotypes successful in the particular environment of a specific property or region. These animals are nowadays increasingly also subject to genetic selection. The outcome of this selection is the basis for ongoing economic success. Reproductive technologies offer a potential safeguard for this highly valuable genomic resource.

Cryopreservation of bull semen and artificial insemination has been widely used in the dairy industry and recently it has gained ground in the beef industry, particularly among those producers who market high quality bulls and cows.



There is limited use of semen cryopreservation by elite cattle producers and limited recognition that semen banking could provide some “insurance” against elite stock loss. The regeneration of valuable herds could be achieved quickly if the semen were used in IVF with oocytes obtained by superovulation of high genetic value females. The fertilized eggs could be implanted in less valuable cattle and the offspring would be that of the elite bull and cow. The outcome would facilitate far more rapid herd regeneration than is otherwise achievable. Cryopreservation of oocytes is far more difficult but the technology is advancing. However, embryos can be vitrified and/or cryopreserved and stored in a bank with sperm to preserve the female and male genetic contributions.

The second role for assisted reproduction is enhancing genetic gain. This is a new discipline; a fusion of genetics and reproduction, perhaps to be called repronomics? Whilst much of the technology described is current, it is mostly not put together into a functional unit as described. Cost and effectiveness also need to be optimized if enhanced industry utilisation is to be achieved.

In this scheme, oocytes collected from superovulated females of high genetic merit are fertilized by semen from high genetic merit bulls using IVF. Small biopsy samples from each embryo establish its genetic profile. Embryos with the desired genetic profiles transferred into recipient low value cows produce elite offspring. Presently these embryos need to undergo vitrification or cryopreservation before they are transferred; this results in the loss of some embryos. Methods are under development to allow oocytes to be recovered, cultured, fertilized, and genetic analysis performed and the elite embryos transferred, all within the same collection cycle.

Genetic gain is directly proportional to improvements in the intensity and accuracy of selection. Improvements in reproductive technology resulting in shortening the generation interval (ie the time between the birth of an animal and the time at which it can first breed) also have important impacts as the generation interval is inversely proportional to genetic gain. Immature females can be superovulated and the oocytes used to shorten the generation interval and increase genetic gain. The next step is to obtain embryonic stem cell lines from high genetic merit females that can be differentiated into oocytes for IVF. This will be the ultimate shortening of the generation interval.

We face a number of scientific and ethical challenges as we move into this future, but the face of animal breeding will be changed irreversibly by harnessing reproductive technologies. Such developments are key to coping with the increased demand for animal protein by a World population that will reach 9 billion within 30 years.

Professor Bob Wong [Antidepressants and other drugs in water environments impacting fish behaviour](#)

Professor Andrew Pask [Uncanny similarity between Tasmanian tiger and wolf more than just skin deep](#)

Dr Marissa Parrot, [Eat your heart out; native water rats have figured out a safe way to eat cane toads](#)

Professor Helena Teede, [Woman In Medical Leadership](#)

Congratulations to.....

Professor Jock Findlay, esteemed international researcher and founder of RHA, has been elected a Fellow of the Australian Academy of Health and Medical Science in recognition for his distinguished career in reproductive health research.

RHA Executive Champions

- Professor Eva Dimitriadis, University Melbourne (Human Health)
- Professor Michael Holland, University of Queensland (Agricultural Productivity)
- Professor Bob Wong, Monash University (Environmental Sustainability)

RHA Steering Group

- Professor John Carroll
- Professor Eva Dimitriadis
- Professor Jock Findlay AO FAHMS
- Professor Michael Holland
- Professor Kate Loveland
- Professor Robert McLachlan AM
- Dr Sarah Meachem
- Professor Sarah Robertson FAA
- Professor Rebecca Robker
- Professor Lois Salamonsen FAA
- Professor Helena Teede, FAHMS
- Professor Bob Wong

RHA Office

- Professor Jock Findlay AO FAHMS (Convenor)
- Dr Sarah Meachem (Executive Officer)
- Dr Liza O'Donnell (Communications)
- Ms Rama Ravinthiran (Student Liason)

RHA Supporting Organisations

- Centre for Reproductive Health, Hudson Institute of Medical Research
- Hudson Institute of Medical Research
- School of Biological Sciences, Monash University
- Monash Biomedicine Discovery Institute, Monash University
- Robinson Research Institute, University of Adelaide
- Healthy Male (formerly Andrology Australia)
- Department of Obstetrics & Gynaecology, University of Melbourne

MEMBERSHIP

Become a RHA member – it's free! Go to www.reproductivehealthaustralia.org.au and click on Become a Member. It's free until June 2021!

JOIN NOW

Without reproduction, life wouldn't exist.

Copyright © 2019 Reproductive Health Australia, All rights reserved.

Want to change how you receive these emails?
You can [update your preferences](#) or [unsubscribe from this list](#).

