Foreword

Australia has a unique mammalian fauna that has evolved since the separation of the Australian continent with the break-up of Gondwana over 60 million years ago. Internationally we are renowned for our iconic mammals, particularly our marsupials and monotremes including the kangaroo, koala and platypus. Yet sadly, research on our native species is not a national priority.

Marilyn Renfree has spent most of her research life uncovering the secrets of marsupial reproduction and development, and by comparing them to eutherian mammals, she has discovered the many novel ways that make marsupials ideal biomedical models. Through this work she and colleagues have made many fundamental contributions to mammalian development, reproduction, genomics evolution and importantly marsupial and monotreme management and conservation. This special issue contains a broad array of articles stemming from the Reproduction Down Under conference held in Kingscliff NSW in August 2017 with participants from all over the world (Fig. 1). The conference was organised to highlight the contributions of Professor Marilyn Renfree to Australian science in the fields of reproduction and development in the year of her 70th birthday.

This conference covered a diverse set of topics in reproduction and development, divided into five main themes over two and a half days. These themes are: Contraception and Conservation; Development and Diapause; Sex and Reproduction, Genomic Imprinting and Marsupial and Monotreme Genomics. Each of these topics is reflected in the papers which follow in this volume and highlight the international interest and amazing contributions that marsupials and monotremes have made to modern biology.

Andrew Pask, Geoff Shaw, Kirsty Short and Marilyn Renfree

Scientific program of the meeting

**Conservation and contraception**
- Steve Johnston: Koalas, echidnas and wombat conservation
- Thomas Hildebrandt: Biotechnology for conservation of wild mammals

**Development and diapause**
- Geoff Shaw: Embryonic diapause: a developmental breather
- Jane Fenelon: How to stop and restart an embryo: diapause around the world
- Stephen Frankenberg: Doing it differently: specification in the absence of an inner cell mass
- Claire Roberts: The dynamic placenta

**Genomic imprinting**
- Anne Ferguson-Smith: Genomic imprinting in eutherians and marsupials
- Shunsuke Suzuki: Emergence of novel CpG islands and genomic imprinting in mammalian evolution
- Mike O’Neill: Imprinting in the placenta
- Fumi Ishino and Tomoko: Acquired traits in mammals: genomic imprinting and roles of LTR retrotransposon-derived genes
- Kaneko-Ishino: Genomic imprinting in mammary glands

**Growth and lactation**
- Kevin Nicholas: Marvels of marsupial milk
- Elizabeth Pharo: Comparative lactation of seals and tammar
- Jenni Hetz and Brandon Menzies: The growth axis and lactation
- John Hearm: The top end – pituitary perspectives

**Marsupial and monotreme genetics and genomics**
- Frank Gruenzer: Sex chromosomes of monotremes
- Asao Fujiyama: Genomics of non-model organisms
- Janine Deakin: Marsupial Chromosomics: bridging the gap between genomes and chromosomes
- Rachel J. O’Neill: Centromere evolution and function in marsupials
- Paul Waters: Comparative genomics of mars and monotreme
- Rob Miller: Immune receptor innovation captured in marsupial and monotreme genomes
- Kathy Belov: A devil of a problem

**Sex and reproduction**
- Robin Lovell-Badge: Making a (eutherian) male
- Peter Koopman: SRY: Getting the ball rolling
- Humphrey Yao: Gonads and germ cells
- Dagmar Wilhelm: A new candidate gene for disorders/differences of sex development
- Jo Bowles: An essential function for a lonely Sox
- Andrew Pask: Gonadal sex reversal
- Andrew Sinclair: Insights from targeted gene sequencing of a large international cohort of patients with Disorders of Sex Development
- Nathalie Joss: The importance of anti-Mullerian hormone in reproduction
- Richard Behringer and Gen Yamada: Development: bats, mice and marsupials

**Growth and lactation**
- Marilyn Renfree: Reproduction Down Under
- John Funder: Summary of Meeting

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Fig. 1. Participants from the Reproduction Down Under Conference: 1, Kathy Belov; 2, Humphrey Hung-Chang Yao; 3, Dagmar Wilhelm; 4, Michael O’Neill; 5, Geoff Shaw; 6, Tamara Keeley; 7, Thomas Bernd Hildebrandt; 8, Rachel O’Neill; 9, Andrew Pask; 10, Jill Shaw; 11, Frances Thomas; 12, Elizabeth Pharo; 13, Jennifer Graves; 14, Janine Deakin; 15, Anne Ferguson-Smith; 16, Nathalie Josso; Marilyn Renfree; 18, Roger Short; 19, Andrew Sinclair; 20, Peter Koopman; 21, Jo Bowles; 22, Robin Lovell-Badge; 23, Blanche Capel; 24, Melanie Laird; 25, Jane Fenelon; 26, Kate Loveland; 27, Claire Roberts; 28, Bethaney Fehrenkamp; 29, Chen Yu; 30, Jessica Dudley; 31, Kevin Nicholas; 32, Leon Hughes; 33, Hiroyuki Imai; 34, Frank Grutzner; 35, Fumitoshi Ishino; 36, Asao Fujiyama; 37, Shunsuke Suzuki; 38, Iain Clarke; 39, Denis Lincoln; 40, John Hearn; 41, John Funder; 42, Peter Temple-Smith; 43, Kathryn Grueber; 44, Paul Waters; 45, Pradeep Tanwar; 46, Emanuele Pelosi; 47, Kim McIntyre; 48, Katie Ayers; 49, Liang Zhao; 50, Stephen Frankenberg; 51, Brandon Menzies; 52, Robert Miller; 53, Jennifer A. Hetz; 54, Kirsty Short; 55, Carolyn Hogg; 56, Richard Behringer; 57, Keng Yih Chew; 58, Jessica Stringer; 59, Nadia Edelsztein; 60, Gen Yamada; 61, Bruce Loveland; 62, Tamsin Short; 63, Stephen Johnston. Not pictured: Tomoko Kaneko-Ishino, Hisato Kobayashi, Gail Risbridger and Yuki Kaneko-Ishino.