



## Preliminary Conference Programme

**Monday, 26 November 2018 (Venue: International Convention Centre)**

**09:30** Registration opens

**10:30** **Opening Ceremony – Welcome to Down Under**

**Co-chairs:** Prof Sakkie Pretorius (Macquarie University)  
Prof Jef Boeke (NYU Langone Health)

- 10:30 **G'day mate, welcome to Oz**
  - *Welcome to Country* by Elder
  - *Opening remarks by the Co-chairs*

**10:45** **Exciting future prospects and where is the impact?**

**Co-chairs:** Prof Nick Mansfield and Dr Louise Brown (Macquarie University)

**Panel:** Dr Leslie Mitchell (New York University), Dr Héloïse Muller (Institut Curie), Dr Giovanni Stracquadanio (University of Essex), Prof Rob Willows, Dr Paul Jaschke and Dr Iniga George (Macquarie University)

- 10:45 **Making a fresh start with young budding synthetic biologists**
  - *5-Minute Poster Lightning talks*. Competition for students and postdoctoral research fellows [early-career researchers (ECRs)]
  - Dr Ross Cloney (Senior Editor: *Nature Communication*) (15 min) *From Academia to Editorial (and Beyond)*
  - Awards for the top three Student and ECR presenters
- 12:15 **Formal Poster Session (1 hour)**
  - Poster viewing while light lunch is served

**Light lunch available during Poster Session**

**13:15** Bus transport for delegates to the Art Gallery NSW leaves from the International Convention Centre

## Monday, 26 November 2018 (Venue: Art Gallery of New South Wales)

### 14:00 Session 1: Coining bioeconomic futures with synthetic biology

**Chair:** Dr Alan Finkel (Chief Scientist of Australia)

- 14:00 **Earning a prosperous place in the global bioeconomy** (20 mins)
  - **Dr Alan Finkel** (Chief Scientist of Australia), **Dr Kate Fairley-Grenot** (Director: AgriFutures Australia), **Lorraine Chiroiu** (CEO of AusBiotech)  
*Maximising Australia's opportunities in the global bioeconomy*
- 14:25 **Benefiting from an entrepreneurial bioeconomy based on knowledge** (20 mins)
  - **Dr Richard Johnson** (Global Helix)  
*Viewing Australia's bioeconomy future through an American lens*
- 14:45 **Powering sustainable biofutures for shared prosperity** (15 mins)
  - **Prof Ian O'Hara** (Queensland University of Technology)  
*Energising, fuelling and refining Queensland's biofutures*
- 15:00 **Inventing a bioeconomic strategy aimed at value and growth** (15 mins)
  - **Prof Richard Kitney** (Imperial College London)  
*Designing the UK's roadmap to achieve an enhanced bioeconomy*
- 15:15 **Capitalising on a global network of biofoundries** (15 mins)
  - **Prof Paul Freemont** (Imperial College London)  
*Accelerating biodesign and bioengineering through automation*

### Afternoon Tea and Networking (15:30 – 16:00)

### Session 2: Graduating with *honoris causa*

**Chair:** Prof S. Bruce Dowton (Vice-Chancellor, Macquarie University)  
**Presiding over a special graduation ceremony**

- 16:00 **A special graduation ceremony for special high-achievers** (15 mins)
  - **Prof S. Bruce Dowton**  
*A framing of Macquarie University's futures*
- 16:15 **Conferral of Doctor of Letters *honoris causa* upon Dr Alan Finkel** (15 min)
  - **Dr Alan Finkel** (Australia's Chief Scientist)  
*Acceptance speech*
- 16:30 **Conferral of Doctor of Science *honoris causa* upon Prof Jef Boeke** (1 Hr)
  - **Prof Jef Boeke** (NYU Langone Health)  
*Acceptance speech and IYSGC2018 opening keynote address*

### Networking event with canapes for all attendees (17:30-18:30)

**08:00 Registration**

**08:30 Session 3: Synthetic biology stretching the realms of possibility**

**Co-chairs: Prof Hugh Durrant-Whyte** (NSW Chief Scientist & Engineer)  
**Dr Natalie Curach** (Bioplatforms Australia)

- 08:30 **Housekeeping and Introduction of Session Chairs** (5 mins)
  - **Prof Sakkie Pretorius**
- 08:35 **Keynote address** (35 mins)
  - **Prof Brenda Andrews** (University of Toronto)  
*Genetic networks and the essential genome*
- 09:10 **Feature Plenary talk** (30 mins)
  - **Dr Tom Ellis** (Imperial College London)  
*Refactoring signalling and metabolism via modular yeast genome engineering*
- 09:40 **Plenary talk** (20 mins)
  - **Dr Tom Williams** (Macquarie University)  
*Engineering and evolution of yeast metabolism*

**Morning Tea (10:00-10:30)**

**10:30 Session 4: Treading the synthetic tightrope with care**

**Co-chairs: Ms Nadia Levin** (Research Australia)  
**Prof Joanne Tompkins** (Australian Research Council)

- 10:30 **Keynote address** (30 mins)
  - **Prof Debra Mathews** (Johns Hopkins University)  
*The role of the public in shaping research*
- 11:00 **Feature Plenary talk** (20 mins)
  - **Dr Erika Szymanski** (University of Edinburgh)  
*Microbial participation and caring for our smallest collaborators*
- 11:20 **Plenary talk** (15 mins)
  - **Dr Alison McLennan** (University of Canberra)  
*Synthetic Biology and Intellectual Property in Australia*
- 11:35 **Plenary talk** (20 mins)
  - **Dr Josh Wodak** (University of New South Wales)  
*Life at the limits: The social dimensions of synthetic biology in the Anthropocene*
- 11:55 **Panel discussion** (20 mins)
  - Facilitated by **Dr Sharon Mascall-Dare** (Making Sense Communications)

**Media briefing and Lunch (12:15-13:30)**

**13:30 Session 5: Raising the synthetic bar**

**Co-chairs:** **A/Prof Matthew Chang** (National University of Singapore)  
**Dr Dan Johnson** (The Australian Wine Research Institute)

- 13:30 **Keynote address** (35 mins)
  - **Prof Bert Poolman** (University of Groningen)  
*Metabolic energy conservation and physicochemical homeostasis in synthetic cells*
- 14:05 **Feature Plenary talk** (25 mins)
  - **Prof Yasunori Aizawa** (Tokyo Institute of Technology)  
*Synthetic biology in the noncoding regions of the human genome*
- 14:30 **Plenary talk** (20 mins)
  - **Dr Jee Loon Foo** (National University of Singapore)  
Building the synthetic yeast chromosome XV and beyond
- 14:50 **Plenary talk** (20 mins)
  - **Prof Junbiao Dai** (Shenzhen Institutes of Advanced Technology, CAS)  
*Design and synthesis of a metazoan chromosome*
- 15:10 **Plenary talk** (20 mins)
  - **Dr Jingchuan Luo and Prof Jef Boeke** (New York University)  
*Karyotype engineering: synthesis and fusion of yeast chromosomes*

---

**Afternoon Tea (15:30-16:00)**

---

**16:00 Session 6: The past and future of DNA are ever present in synthetic biology**

**Co-chairs:** **Dr Romain Koszul** (Institut Pasteur)  
**Prof Barbara Messerle** (Macquarie University)

- 16:00 **Keynote Plenary talk** (25 mins)
  - **Prof Joel Bader** (Johns Hopkins University)  
*Detecting evidence of genetic engineering in production yeast species*
- 16:25 **Feature plenary talk** (25 mins)
  - **Prof Ian Paulsen** (Macquarie University)  
*Discovering new efflux pumps: How to get things out of a cell*
- 16:50 **Plenary talk** (20 mins)
  - **Prof Oliver Rackham** (University of Western Australia)  
*Engineered protein scaffolds to target nucleic acids*
- 17:10 **Plenary talk** (20 mins)
  - **A/Prof Claudia Vickers** (University of Queensland)  
*Synthetic biology tools to control carbon flux and couple production to bioprocess conditions: isoprenoids as a model system*

---

**Sydney Harbour Cruise Dinner for all attendees (18:30-22:30)**

---

## Wednesday, 28 November 2018 (Venue: International Convention Centre)

08:00 Registration

08:30 **Session 7: Synthetic biology pioneers new possibilities**

**Co-chairs:** Prof Chandra Chandrasegaran (Johns Hopkins University)  
Dr Deb Hailstones (NSW Department of Primary Industries)

- 08:30 **Housekeeping and Introduction of Session Chairs** (5 mins)
  - Prof Sakkie Pretorius
- 08:35 **Keynote address** (35 mins)
  - Prof Christina Smolke (Stanford University)  
*Biosynthesis of complex plant-derived natural products*
- 09:10 **Feature Plenary talk** (30 mins)
  - Prof Birger Lindberg Møller (University of Copenhagen)  
*Merging pathway discovery and yeast bioengineering to produce high value diterpenoids*
- 09:40 **Plenary talk** (20 mins)
  - Prof Aleksandra Filipovska (University of Western Australia)  
*Manipulating mitochondrial metabolism*

### Morning Tea (10:00-10:30)

10:30 **Session 8: Breaking through the neo-synthetic sound barrier**

**Co-chairs:** Prof Yizhi (Patrick) Cai (Manchester University)  
Prof Helena Nevalainen (Macquarie University)

- 10:30 **Keynote address** (35 mins)
  - Prof Danielle Tullman-Ercek (Northwestern University)  
*Pushing the cellular boundaries: Thoughts and lessons learnt from the manipulation of biological interfaces*
- 11:05 **Feature Plenary talk** (25 mins)
  - Dr Leslie Mitchell (New York University)  
*The awesome power of synthetic neochromosomes*
- 11:30 **Plenary talk** (20 mins)
  - Dr Anthony Borneman (The Australian Wine Research Institute)  
*Constructing a synthetic yeast pan-genome neochromosome*
- 11:50 **Plenary talk** (20 mins)
  - Dr Daniel Schindler (University of Manchester)  
*Design and characterisation of a de novo constructed eukaryotic tRNA neochromosome*
- 12:10 **Plenary talk** (20 mins)
  - Prof Lars Nielsen (University of Queensland)  
*Once you eliminate the impossible: Deriving large-scale kinetic models through Bayesian sampling*

---

## Lunch (12:30-13:30)

---

### 13:30 **Session 9: Designing, reinventing and rewiring genomes and genetic networks**

**Co-chairs:** Prof Yingjin (YJ) Yuan (Tianjin University)  
Dr Kate Howell (University of Melbourne)

- 13:30 **Keynote address (30 mins)**
  - **Prof John Glass** (Craig Venter Institute)  
*Design, construction and analysis of a synthetic minimal bacterial cell*
- 14:00 **Feature Plenary talk (20 mins)**
  - **Prof Hiroshi Takagi** (Nara Institute of Science and Technology)  
*New metabolic regulation and physiological function of amino acids and their application*
- 14:20 **Plenary talk (20 mins)**
  - **Dr Yue (Chantal) Shen** (China National GeneBank/BGI-Research)  
*Redesigning the yeast genome to reveal its molecular intricacies and introduce extensibility*
- 14:40 **Plenary talk (20 mins)**
  - **Prof Jim Haseloff** (University of Cambridge)  
*Open tools for organism-scale design and engineering in plants*

---

## Afternoon Tea (15:00-15:30)

---

### 15:30 **Session 10: Forging new frontiers beyond the horizon**

**Co-chairs:** Prof Jef Boeke (NYU Langone Health)  
Prof Sakkie Pretorius (Macquarie University)

- 15:30 **Keynote address (30 mins)**
  - **Prof Farren Isaacs** (Yale University)  
*Genomes by design: Recoding & Rewriting life's genetic blueprint*
- 16:00 **Keynote address talk (30 mins)**
  - **Prof Lars Steinmetz** (Stanford University)  
*Personalised health, applying synthetic and edited genomes*
- 16:30 **Feature Plenary talk (20 mins)**
  - **Prof Kathryn North** (University of Melbourne)  
*Genomics and the brave world of personalised medicine: a global and local perspective*
- 16:50 **Closing address (30 mins)**
  - **Prof Floyd Romesberg** (The Scripps Research Institute)  
*A semi-synthetic organism that stores and retrieves increased genetic information*

**17:20 Closing remarks by Conference Co-Chairs (10 mins)**

---

## Closing Drinks and Canapes (17:30-19:00)

---