



7th INTERNATIONAL YEAST 2.0 SYNTHETIC GENOMES CONFERENCE

Preliminary Conference Programme

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

09:00 Registration opens

10:15 **Opening Ceremony – Welcome to Down Under**

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

- 10:15 **G'day mate, welcome to Oz**
 - *Welcome to Country* by Elder
 - *Opening remarks by the Co-chairs*
 - *Opening address by the Hon. Victor Dominello, MP, Minister for Finance, Services & Property*

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 Lawrence Lee (University of NSW), **Prof Rob Willows** (Macquarie University),
Dr Paul Jaschke (Macquarie University), **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)]
Monica Espinosa Gomez, Yu Zhao, Rosemary Cripwell, Roy Walker, Lena Hochrein, Cristian Varela, Giovanni Stracquadanio, Kate Howell, Weimin Zhang, Heinrich Kroukamp, Aaron Brooks
- 12:05 **Dr Ross Cloney (Senior Editor: *Nature Communication*) (15 mins)**
From academia to editorial (and beyond)
- 12:20 Awards for the top Student and ECR presenters
- 12:30 **Formal Poster Session (45 mins)**
 - 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**

Sponsored by NSW Department of Primary Industries

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

- 14:00 Dr Phil Wright (NSW DPI) (5 mins)
- 14:05 **Earning a prosperous place in the global bioeconomy (15 mins)**
 - **Dr Alan Finkel AO** (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 OBE** (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 in a global network of biofoundries

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

Session 2: Macquarie University Graduation Ceremony

Presided over by Prof S. Bruce Dowton, Vice-Chancellor and President, Macquarie University

Conferral of Doctor of Letters *honoris causa* upon Dr Alan Finkel AO, Australia's Chief Scientist

In recognition of his outstanding contribution to Australian science, medicine and innovation

Conferral of Doctor of Science *honoris causa* upon Professor Jef Boeke, NYU Langone Health

In recognition of his visionary leadership of the groundbreaking international Yeast 2.0 project

IYSGC2018 Opening Keynote address (60 mins)

- **Prof Jef Boeke, NYU Langone Health**

Networking events

All delegates: Drinks and canapes – Ground floor Art Gallery of NSW 'Australian Galleries' (17:30-18:30)

Speakers and Organisers: Dinner – Art Gallery of NSW 'Restaurant Function Space' (18:30)

Tuesday, 27 November 2018 (Venue: International Convention Centre)

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 CC** (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 facilitated by Dr Sharon Mascall-Dare

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**

Sponsored by CSIRO

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

- 16:00 A/Prof Claudia Vickers (CSIRO) (5 mins)
- 16:05 **Keynote Plenary talk (25 mins)**
 - **Prof Joel Bader** (Johns Hopkins University)
Seeking evidence of genetic engineering
- 16:30 **Feature plenary talk (25 mins)**
 - **Prof Ian Paulsen** (Macquarie University)
Extending our synthetic biology toolkit – identifying novel metabolite efflux pumps
- 16:55 **Plenary talk (20 mins)**
 - **Prof Oliver Rackham** (University of Western Australia)
Engineered protein scaffolds to target nucleic acids
- 17:15 **Plenary talk (20 mins)**
 - **Dr Esteban Marcellin Saldana** (University of Queensland)
From greenhouse gases to renewable chemicals: a new opportunity for synthetic biology
- 17:35 **Plenary talk (20 mins)**
 - **A/Prof Claudia Vickers** (CSIRO/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 (19:00-23:00)

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

08:00 Registration

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

Co-chairs: **Em Prof Ian Dawes** (University of New South Wales)
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 plant 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)
Learning to design, designing to learn: the dual program of automated strain engineering

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)
A simple model plant for whole organism engineering

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)
Genome engineering technologies for programming and recoding organisms
- 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 AM** (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)

