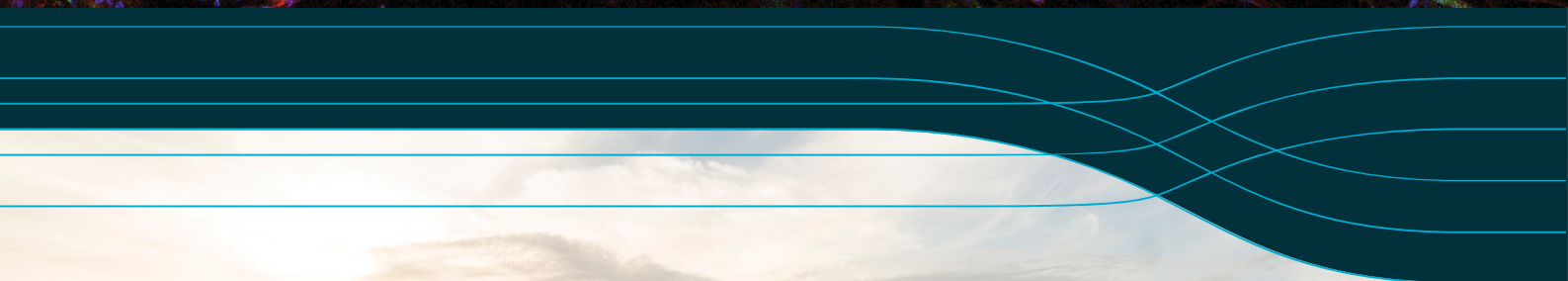


*Cutting Edge Symposia*

# *Challenges and opportunities for "ex vivo" model systems*

**Wed 26th - Fri 28th February 2020**

***"The Dome"* Geelong Library & Heritage Centre**

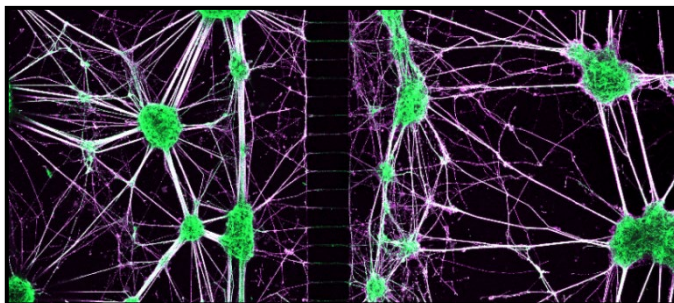


**Recent developments in 3D tissue culture, stem cell technology, automation, micro and nano fabrication.**

**Addressing key challenges for developing these technologies to replicate disease progression and pathogenesis.**



The last few years have seen dramatic breakthroughs in materials science and cell biology leading to the development of new and increasingly complex experimental platforms.



Advances in automation, nanofabrication, 3D tissue culture and stem cell technology are at the forefront of modern research and are now being applied to a broad range of diseases.

This forum is led by researchers within Australia's national science agency, the CSIRO and based at Australia's biocontainment facility - the Australian Animal Health Laboratory (AAHL).

This timely forum will:

- Showcase how these new technologies can be adopted to model a range of disease processes.
- Help researchers to consolidate knowledge, standardise procedures and address key challenges in applying these cutting edge technologies to model pathogenic diseases.

A critical and in-depth discussion of this topic, led by experts across various disciplines, will address the growing need to develop translatable approaches to modelling disease in complex cellular microenvironments and organ systems.

We are inviting researchers in the field to submit abstracts by 4<sup>th</sup> December 2019. Registrations and abstracts will be reviewed and confirmed by 23<sup>rd</sup> December 2019.

Convening Committee

*The 2020 Cutting Edge Symposia – Challenges and opportunities for "ex vivo" model systems*



## Conference location



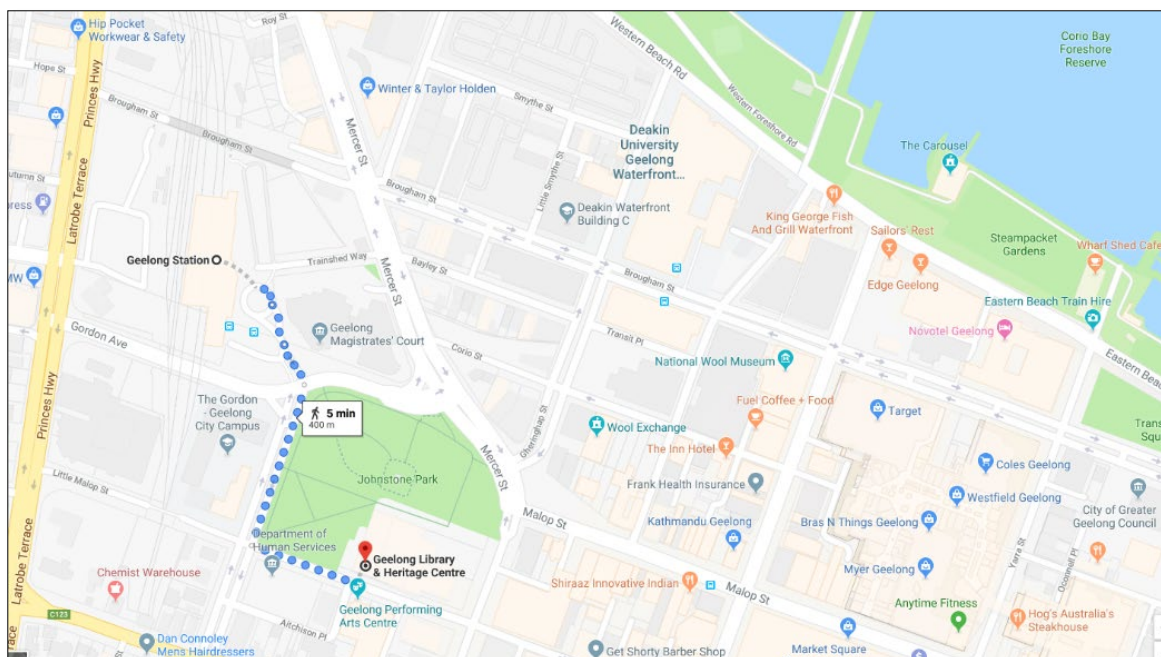
This Cutting Edge Symposium will be held in the regional port city of Geelong, Australia. Geelong is home to large Deakin University campuses, several hospitals and other research institutes including Australia's biocontainment facility, The CSIRO Australian Animal Health Laboratory (AAHL).



This meeting will be held in “*the High Ground - Wurdi Youang*” room under Geelong Regional Library and Heritage Centre’s distinctive Dome. The High Ground is a unique, 250 capacity space with inspiring architecture, intuitive technology and a north-facing balcony with scene-stealing views over Geelong, Corio Bay and the You Yangs. Located in the heart of Geelong’s cultural precinct, the High Ground is adjacent to historic Johnstone Park, the CBD and the waterfront.



This venue is also adjacent to the Geelong railway station and therefore provides an easy daily commute for attendees from Melbourne.





# Tentative Program

## **DAY 1:**

### ***Models of disease: Relevance, advantages & limitations***

#### **Challenges in modelling human and animal disease processes**

*This session will be structured as a prelude discussion to subsequent topics. The aim of this session is to outline the current models, challenges and future needs with a particular focus in the area of modelling host-pathogen biology for human and animal disease.*

#### **Engineering representative animal models: current advances, challenges and limitations**

*The advent of gene-editing technology has led to the emergence of new and improved animal models of disease that are increasingly humanised, express reporters or are more susceptible to disease. This session will discuss the current advances in animal modelling, whilst outlining gaps and hurdles in implementing these systems and where future advancements need to be made.*

#### **Application of Stem Cell Technology for Disease Models: filling the gaps of *in vivo* models**

*Since 2006, methods for making stem cells and an expanding range of differentiation protocols have been devised allowing for the creation of new models of disease previously not possible. Advantages and challenges of stem cell-derived systems will be showcased and discussed.*

#### **Early Career Researchers mini oral session**

*5 minute presentations with 2 minute questions for ECRs and students only.*

## **DAY 2:**

### ***Fabricated microenvironments, automation and data integration***

#### **Organoid and 3D culture models for personalised treatment strategies**

*Recent years have seen a rapid increase in the use of organoid cultures for research. These complex systems self-organise to recapitulate many essential features of tissues but exhibit inherent variability and in many cases require consensus within the scientific community on culturing techniques. How these complex cultures can be further modified to reveal new insights into pathogenesis will be explored.*

#### **Next-generation fabrication for researchers**

*Micro/nanofabrication technologies are increasingly utilised for cell biology applications. A wide range of surfaces and bioscaffolds have now been created to recapitulate microenvironments and regulate cell behaviour or response. Presenters will outline how these new advances in material science can best be applied to deliver new insights into pathogenesis and deliver new diagnostics and treatments.*

#### **Model systems “wish list” workshop**

*Panel discussion around problems with current models/ future hurdles/ potential applications. 4-5 selected leaders representing academia and industry across each field will participate in a panel discussion to facilitate cross talk across disciplines.*

#### **Automated technologies and data systems**

*Robotics and high throughput screening platforms have allowed us to understand the full complexity of host-disease interactions and reveal new candidates for therapy. Robust assay development and detailed planning are essential for success and will be discussed by leaders in the field.*



### **DAY 3:**

### ***AAHL showcase and career opportunities for ECRs***

#### **Morning sessions at Australia's biocontainment facility, The Australian Animal Health Laboratory (AAHL).**

*We will offer a virtual tour of the facility coupled with discussion and presentations from CSIRO researchers and external collaborators to showcase the work that is possible within the facility. Early Career Researchers and students will be encouraged to present their work in this session.*

*During the morning a limited number of physical tours into the secure area will be offered and undertaken for symposium participants that have pre-registered.*

#### **ECR career discussion and networking workshop at Little Creature Brewery Geelong.**

This panel will focus on career development for Early Career Researchers, particularly around productive ways to collaborate across disciplines to achieve high impact science in their research.



## **Key Dates**

- 4<sup>th</sup> December 2019 Abstract Submissions closed
- 23<sup>rd</sup> December 2019 Registrations, Oral and Poster Presentations Confirmed

## **Convening Committee**

| CSIRO-AAHL  | CSIRO-Manufacturing                                     | CSIRO-Health and Biosecurity  |
|---|---|---|
| Nathan Gödde (co-chair)<br>Megan Dearnley (co-chair)<br>Vinod Sundaramoorthy<br>Ryan Farr<br>John Bingham | Sally McArthur (Swinburne University)<br>Carmel O'Brien | Michelle Baker<br>Leah Cosgrove<br>Elizabeth Pharo<br>Sinead Williams |

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