

# Pre-clinical Modelling of Human Genetic Disease and Therapy

The Royal Society of Edinburgh  
8 – 10 May 2024

## Programme



### Day 1: Wednesday 8 May 2024

12:00 – 13:00 **Registration opens**

13:00 – 13:15 **Welcome – Organisers: Liz Patton and Owen Sansom**

#### **Session 1 – Cancer genetics, sponsored by Cancer Research UK Scotland Centre**

**Chair: Owen Sansom** Beatson Institute of Cancer Research, Glasgow, Scotland

13:15 – 13:45 **Ross Cagan** University of Glasgow, Scotland  
Fly models of RASopathies

13:45 – 14:15 **Cristina Lo Celso** Imperial College London, UK  
Interactions between healthy and malignant haematopoiesis in the bone marrow microenvironment

14:15 – 14:45 **Ramanuj DasGupta** A\*STAR Genome Institute of Singapore, Singapore  
Mapping spatio-temporal trajectories of tumour evolution, "one cell at-a-time"

14:45 – 15:15 **Hao Zhu** University of Texas, USA  
Clone wars: evolution of adaptation and malignancy in the liver

15:15 – 15:25 **Bio-Rad Laboratories**  
(8 minute talk, plus 2 minute Q&A)

15:25 – 16:00 **Tea/coffee break**

#### **Session 2 – Congenital disorders (I)**

**Chair: Pleasantine Mill** University of Edinburgh, Scotland

16:00 – 16:30 **Robert Semple** University of Edinburgh, Scotland  
Modelling developmental overgrowth disorders caused by mosaic activating PIK3CA mutations

- 16:30 – 17:00** **Cecilia Lo** University of Pittsburg, USA  
Systems approach in interrogating the genetics of congenital heart disease and insights into disease mechanisms
- 17:00 – 17:30** **Laura Greaves** Newcastle University, UK  
Development of new model systems to investigate the impact of mitochondrial DNA mutations on the pathogenesis of human disease
- 17:30 – 17:45** **Short talk Lucía Luengo-Gutiérrez** University of Cambridge, UK  
Retinal pathophysiology characterisation of the novel mitochondrial heteroplasmy mouse model m.5019A>G
- 17:45 – 18:00** **Short talk Scott Waddell** University of Edinburgh, Scotland  
From mouse to patient and back again: exploring the microenvironment in polycystic liver disease
- 18:00 – 18:15** **Flash talks Emma Hall** University of Edinburgh, Scotland; **Ilaria Signoria** Brain Center, The Netherlands; **Alex Raven** CRUK, Scotland Institute, Scotland; **Gareth Hardisty** University of Edinburgh, Scotland; **Sarah Muise** University of Edinburgh, Scotland
- 18:15 – 19:45** **Drinks reception and posters (Poster session 1)**

## Day 2: Thursday 9 May 2024

### Session 3 – Neural and muscular disorders

**Chair: Wendy Bickmore** University of Edinburgh, Scotland

- 09:00 – 09:30** **Adrian Bird** University of Edinburgh, Scotland  
The molecular basis of Rett syndrome
- 09:30 – 10:00** **Jason Rihel** University College London, UK  
Behavioural pharmacology predicts both perturbed and rescuing signalling pathways in zebrafish mutants of Alzheimer's disease risk genes
- 10:00 – 10:15** **Short talk Rebekah Tillotson** University of Edinburgh, Scotland  
Modelling intellectual disability and alpha-thalassemia in mice carrying an ATR-X syndrome patient mutation
- 10:15 – 10:45** **David Gutmann** Washington University School of Medicine, USA  
Preclinical modeling of cancer predisposition in neurofibromatosis 1 (NF1)
- 10:45 – 11:00** **Flash talks Kelly Blacklock** University of Edinburgh, Scotland; **Soniya Malik** University of Wolverhampton; **Zhongzhou Yang** Nanjing University, China; **Kasia Milto** University of Edinburgh, Scotland; **Shipra Bhatia** University of Edinburgh, Scotland
- 11:00 – 11:30** **Tea/coffee break and group photo**

## Session 4 – Inflammatory disease

**Chair: Sara Brown** University of Edinburgh, Scotland

- 11:30 – 12:00** **Ellen van den Bogaard** Radboud University Medical Center, The Netherlands  
Modelling chronic inflammatory skin diseases in organotypic skin models:  
from pathophysiology to therapeutics
- 12:00 – 12:30** **Fiona Powrie** University of Oxford, UK  
Translating immunology into new therapies for inflammatory bowel disease:  
discovery to translation
- 12:30 – 12:45** **Short talk Marie-Therese El-Daher** University of Edinburgh, Scotland  
ATRX deficiency reveals cGAS-mediated transcriptional regulation of type I  
interferon signalling
- 12:45 – 13:00** **Short talk Brian Ciruna** Hospital for Sick Children, Toronto, Canada  
Zebrafish models of idiopathic scoliosis link oxidative stress with  
intervertebral ECM defects, identifying first-in-kind prognostic biomarkers  
and possible therapeutic targets
- 13:00 – 14:00** **Lunch and posters**

## Session 5 – Translational cancer models

**Chair: Charlie Gourley** University of Edinburgh, Scotland

- 14:00 – 14:30** **Angelika Schnieke** Technical University of Munich, Germany  
Porcine cancer models for clinical translation
- 14:30 – 15:00** **James Amatruda** Children's Hospital Los Angeles, USA  
Fusion oncogene sarcomas: models, mechanisms and therapies
- 15:00 – 15:30** **Karen Blyth** Beatson Institute for Cancer Research, Scotland  
Contextualising cancer complexity through holistic mouse models
- 15:30 – 16:00** **Harriet Holme** PCD Research, Weatherden, UK  
Patient derived pre-clinical models
- 16:00 – 16:30** **Tea/coffee break**

## Special session

### Improving the translational impact of pre-clinical research

**Chair: Pleasantine Mill** University of Edinburgh, Scotland

- 16:30 – 16:50** **Emily Sena** University of Edinburgh, Scotland  
How we might improve the usefulness of our preclinical research
- 16:50 – 17:30** **Panel discussion: Improving the translational impact of pre-clinical research**  
**Emily Sena** University of Edinburgh, Scotland  
**Ross Cagan** University of Glasgow, Scotland  
**Sara Wells** MRC National Mouse Genetics Network, UK

17:30 – 19:00 **Drinks reception and posters (Poster session 2)**

19:00 – 21:30 **Conference dinner**

## Day 3: Friday 10 May 2024

### Session 6 – Congenital disorders (II)

**Chair: Luke Boulter** University of Edinburgh, Scotland

09:00 – 09:30 **John Sayer** Newcastle University, UK  
Investigating and treating primary renal ciliopathies

09:30 – 10:00 **Karen Liu** King's College London, UK  
Screening and identification of gene-function interactions in neurocristopathies

10:00 – 10:30 **Stefan Somlo** Yale School of Medicine, USA  
*In vivo* discovery of novel molecular signaling components in polycystic kidney disease

10:30 – 11:00 **Tea/coffee break**

### Session 7 – Therapeutic strategies for neuromuscular disease

**Chair: Sara Wells** MRC National Mouse Genetics Network, UK

11:00 – 11:30 **Eckhard Wolf** University of Munich, Germany  
Testing new therapeutic and diagnostic concepts in Duchenne muscular dystrophy pigs

11:30 – 12:00 **James Dowling** University of Toronto, Canada  
Pre-clinical models and the development of genetic therapies for rare neurogenetic diseases

12:00 – 12:30 **Ian Smyth** Monash University, Australia  
The role of Aurora Kinase A in the development of polycystic kidney disease

12:30 – 12:45 **Short talk Sek-Shir Cheong** Imperial College London, UK  
TReATS: A novel method for TAT-Cre Recombinase-mediated floxed Allele modification in *ex vivo* Tissue Slices

12:45 – 14:15 **Lunch and posters (Poster session 3)**

### Session 8 – Functional cancer genomics

**Chair: Katrin Ottersbach** University of Edinburgh, Scotland

14:15 – 14:45 **Daniel Peeper** The Netherlands Cancer Institute, The Netherlands  
Function-based genomics to combat immunotherapy resistance

14:45 – 15:15 **Gillian Morrison** University of Edinburgh, Scotland  
The Glioma Cellular Genetics Resource: a cellular toolbox to tackle glioblastoma

- 15:15 – 15:30** **Short talk Jasmine Ho** CRUK Scotland Institute, Scotland  
NF $\kappa$ B signalling promotes liver metastasis in genetically engineered mouse models of colorectal cancer
- 15:30 – 16:00** **Andrew Wood** University of Edinburgh, Scotland  
Degron peptides: cancer mutation hotspots and target validation tools
- 16:00 – 16:30** **David Adams** Wellcome Sanger Institute, UK  
Editing the cancer genome base-by-base
- 16:30** **Concluding remarks and departure: Liz Patton**