

CAUSALITY IN BIOLOGY & AI

10-11 NOVEMBER 2025
PRBB AUDITORIUM, BARCELONA

Day 1 — Mon 10 Nov 2025

14:15. Welcome & Presentation [James Sharpe](#) (Collaboratorium – EMBL Barcelona); [Mafalda Dias](#) (CRG)

Session I: Causality Concepts — Chair: Mafalda Dias

14:30. [Born in Water, Built in Silicon. Are We Really So Different in Intelligence?](#)

[Denis Noble](#) (University of Oxford)

15:10. [Causal Learning for Complex Cellular Systems](#)

[James DiFrisco](#) (Francis Crick Institute)

16:20. [Emergent \(Non-\)Causal Abstractions Over Causal Structure in Mesoscale Biological Systems](#)

[Jonas Hartmann](#) (UCL)

17:00. [Downwards Causality from Tissues to Genes](#)

[James Sharpe](#) (EMBL Barcelona)

17:40. [Integrating Biology Across Scales: How Causal is “Causal”?](#)

[Ava Khamseh](#) (University of Edinburgh)

18:20. *End of Day 1 — [James Sharpe](#) (EMBL Barcelona) and reception at the Collaboratorium at 19:00*

Day 2 — Tue 11 Nov 2025

09:15. Summary of Day 1 & Introduction to Day 2 [Mafalda Dias](#) (CRG)

Session II: Causality at Different Scales of Biology — Chair: James Sharpe

09:30. [Of Cause and Effect in Rapidly Self-Organizing System](#)

[Gaudenz Danuser](#) (Institute for Human Biology)

10:10. Systems Biology research programme

[Nicholas Edward Stroustrup](#) (CRG)

11:20. [Host-Microbiome Interactions: Leveraging Genetic Variation in the Host to Better Understand Causality](#)

[Amelie Baud](#) (CRG)

12:00. [Statistical genomics and systems genetics](#)

[Oliver Stegle](#) (EMBL Germany)

12:40. Flash Talks — Junior Researchers

Session III: Causality in AI Models — Chair: Gaudenz Danuser

14:30. [Causal Representation Learning: From Biomarkers to Mechanisms](#)

[Caroline Uhler](#) (Broad Institute of MIT & Harvard)

15:10. [Explainable AI for Protein Design](#)

[Noelia Ferruz](#) (CRG)

16:20. [Causal Molecular Design](#)

[Eli Weinstein](#) (DTU, Denmark)

17:00. *Closing Remarks* [James Sharpe](#) (Collaboratorium – EMBL Barcelona)

Supported by:



Funded by:

