



24th HFSP AWARDEES MEETING

9–11 July 2025 | Melbourne, Australia



International

**Human Frontier
Science Program**

Organization

THE INTERNATIONAL HUMAN FRONTIER SCIENCE PROGRAM ORGANIZATION

HFSP Board of Trustees

Steve Wesselingh, Australia
Alejandro Adem, Canada
Adrian Mota, Canada
Signe Ratso, European Commission
Henriette Van Eijl, European Commission
Nacer Boubenna, France
Christian Boehm, Germany
Ingrid Ohlert, Germany
Rajesh Gokhale, India
Pushkar Sharma, India
Iris Eisenberg, Israel
Barak Gatlenyo, Israel
Marcela Devoto, Italy
Pietro Pietrini, Italy
Hitoshi Nakagama, Japan
Yoshihiro Yoneda, Japan

Sunghoon Hwang, Republic of Korea
Hyong-Ha Kim, Republic of Korea
Troels Petersen, New Zealand
Kristin Danielsen, Norway
Benedicte Løseth, Norway
John Lim, Singapore
Teck Seng Low, Singapore
Gugu Moche, South Africa
Liesl Zuhlke, South Africa
Sarah Glaser, Switzerland
Thomas Werder Schlaepfer, Switzerland
Amanda Collis, United Kingdom
Mark Palmer, United Kingdom
Susan Marqusee, United States of America

HFSP Council of Scientists

Philip Hodgkin, Australia
Juliet Daniel, Canada
Mart Saarma, European Commission
Richa Rickhy, India
Fabio Benfenati, Italy
Hiroki Ueda, Japan

Kurt Krause, New Zealand
Aurora Martínez, Norway
Cheil Moon, Republic of Korea
Kong Peng Lam, Singapore
Kelly Chibale, South Africa
Paul Turner, United States of America

Program Committee

Pavel Kabat
Guntram Bauer
Almut Kelber
Barbara Pauly

Organizing Committee

Guntram Bauer
Liliana Gonçalves
Katie Luck
Severine Etchanchu
Irene Kuge
Olaf Kelm

PRACTICAL INFORMATION

Venues

Meeting Venue (Wednesday to Friday, 9–11 July)
Monash College (city center), 750 Collins Street

Welcome Reception Venue (Tuesday, 8 July)
The Westin Melbourne, 205 Collins Street, Melbourne

Meeting Dinner Venue (Wednesday, 9 July):
Melbourne Museum, 11 Nicholson Street, Melbourne



 Monash College City Center  The Westin Melbourne  Melbourne Museum

The HFSP Awardees Meeting venues are conveniently located within Melbourne's Free Tram Zone.

Registration and Information Desk

Participants can collect their meeting badge from the HFSP registration desk at the Westin Hotel (Welcome Reception Cocktail) on Tuesday, 8 July 2025, from 16:00 onwards.

Badges can also be picked up from the registration desk at Monash University (750 Collins Street – City Center Campus) on Wednesday, 9 July 2025, from 08:30 a.m.

For any general information, delegates can make inquiries at the registration desk as well. Printed programs and other meeting materials can be collected at these desks.

Luggage Storage

Participants are recommended to leave luggage in their hotel since storage at the venues is limited.

WIFI

The venue offers free Wi-Fi. The network name and password will be provided during the meeting.

Photography

Many awardees present unpublished data. Therefore, HFSP reminds participants not to photograph slides with data during oral presentations or posters without permission from the authors.

Social Media

We encourage participants to post content about the meeting on social media. Please consider using the hashtag **#HFSPmtg2025** in posts. Please consider tagging the HFSP pages using the following handles:

X: @HFSP

Bluesky: @hfspo.bsky.social

LinkedIn: @human-frontier-science-program-hfsp

Facebook: @HFSP

Since awardees often show unpublished data, do not publish results without permission from the authors.

Plenary Lectures, Oral Sessions and Poster Teaser Talks

A Control Desk will be available in the Auditorium/Amphitheatre. All presenters can load presentations at the Control Desk at the latest during the break prior to their presentation. Presenters cannot use their laptops to present.

The Control Desk will be open each morning from 08:30 throughout the day.

PowerPoint presentations should be made in 16:9 screen format. Please note that the on-site display will use PC screens. We therefore suggest you check your presentation using Windows prior to the upload.

Poster Sessions

Participants should refer to the poster listing in the meeting program for the number of their posters. Posters should be installed on the poster board corresponding to the number in the program on the first morning of the meeting (Wednesday) and removed following the last onsite poster session on Friday. A printing service is not available at the conference venue. We strongly advise presenters to bring their posters with them to Melbourne, as options to print locally are limited.

Lunch and Coffee Breaks

Coffee breaks, lunches and the farewell cocktail will be served in the foyer of the Monash University – City Center Campus.

Social Program

Tuesday, 8 July 2025, 18:00 Welcome Reception at the Westin Melbourne

Wednesday, 9 July 2025, 19:00 Conference Dinner Reception at the Melbourne Museum

Friday, 11 July 2025, 18:00 Farewell Cocktail at the Monash College

PROGRAM

Wednesday, 9 July 2025

8:30–9:00 | REGISTRATION | *ENTRY HALL*

9:00–9:15 | OPENING REMARKS | *AUDITORIUM*

Yoshihiro Yoneda, President of HFSP

Pavel Kabat, Secretary General of HFSP

9:15–9:45 | NAKASONE CEREMONY | *AUDITORIUM*

Yoshihiro Yoneda, President of HFSP

Pavel Kabat, Secretary General of HFSP

Jacob Hanna, Weizmann Institute of Science, Israel

9:45–10:15 | COFFEE BREAK | *LOUNGE AREA*

10:15 –11:30 | NAKASONE LECTURE | *AUDITORIUM*

Jacob Hanna, Weizmann Institute of Science, Israel

11:30 –12:50 | ORAL SESSION 1 | *AUDITORIUM*

Chair: Almut Kelber

High-throughput synthesis and evaluation of antiviral copolymers for enveloped respiratory viruses

Nathan Boase, Queensland University of Technology (QUT), Australia

Seeing is believing: correlated single-cell imaging of extracellular electron transfer and associated protein structures reveals that diverse environmentally important bacteria respire via cytochrome nanowires secreted by hybrid type-4 pilus/type 2 secret

Nikhil Malvankar, Yale University, United States of America

Avian sensing of airflow through feather vibration

David Perkel, University of Washington, United States of America

Development and validation of Interorganelle Communication Matrixes for studying mitochondrial nuclear communication.

Konstantinos Lefkimmiatis, University of Pavia, Italy

12:50–14:00 | LUNCH | *ENTRY HALL*

14:00–15:20 | ORAL SESSION 2 | [AUDITORIUM](#)

Chair: Phil Hodgkin

How life got moving: reconstructing and re-evolving the bacterial flagellar motor
Matthew Baker, UNSW Sydney, Australia

The Cell Biology of Pluripotency
Jennifer Zenker, Monash University, Australia

Single molecule localization imaging of Env clustering in native HIV-1 viruses
Cecilia Zaza, University College London, United Kingdom

Bacterial targeting of the host epitranscriptome
Elizabeth Hartland, Hudson Institute of Medical Research, Australia

15:20–16:00 | POSTER TEASER TALK 1 | [AMPHITHEATRE](#)

Chair: Guntram Bauer

Is Quantum Coherence Important in Coupling the Antenna System to the Photosystem in Cryptophytes?
Gruning Gesa, University of New South Wales, Australia

A Functional Genomics Approach to Study Human-Specific Neural Progenitor Cell Development
Mai Ahmed, The Hospital for Sick Children, Canada

Nanoscale Curvature Enriches the Membrane-Associated Condensation of LAT/Grb2/SOS1
Wenting Zhao, Nanyang Technological University, Singapore

Hijacking Mosquitoes: Infection Dynamics of Dengue Virus in the Mosquito Brain
Umberto Palatino, The Rockefeller University, United States of America

Cross-Species Insights into Skeletal Muscle Homeostasis
Hong-Wen Tang, Duke-NUS Medical School, Singapore

Structural phylogenetics and the evolution of the bacterial flagellum
Nicholas Matzke, University of Auckland, New Zealand

Filming Insects in Action Using Fast Lock-On Tracking
T. Thang Vo-Doan, The University of Queensland, Australia

16:00–18:00 | POSTER SESSION 1 | [EXHIBITION AREA](#)

19:00–22:00 | MEETING DINNER | [MELBOURNE MUSEUM](#)

Thursday, 10 July 2025

8:30–10:10 | ORAL SESSION 3 | AUDITORIUM

Chair: Elyse Williams

Artificial allosteric protein switches with machine learning-designed receptors

Kirill Alexandrov, Queensland University of Technology, Australia

Integrated approaches for the recognition of small molecule inhibitors for toll-like receptor 4

Ramanathan Sowdhamini, National Centre for Biological Sciences, India

Haemogenic and intermediate gastruloids: novel 3d stem cell-based embryo models to study blood development in vitro

Susanne Carina van den Brink, Hospital del Mar Research Institute, Spain

Unraveling the transcriptomic landscape of reptilian chromatophores: from development to color-producing cells

Athanasia Tzika, University of Geneva, Switzerland

Probing the evolutionary ecology of cognition through High-Density Diffuse Optical Tomography

Carlos A. Botero, University of Texas, United States of America

9:45–10:15 | COFFEE BREAK | LOUNGE AREA

10:40–12:20 | ORAL SESSION 4 | AUDITORIUM

Chair: Barbara Pauly

Shuffling the Genomic Deck: Engineering Bacterial Genome Diversity

Briardo Llorente, Macquarie University, Australia

Origins of cell types and alternative neural systems

Leonid Moroz, University of Florida, United States of America

Receptor-normalized generalist-specialist viral co-infections in marine Vibrio bacteria

Jacob Bobonis, University of Vienna, Austria

Exome capture of mitochondrial symbiont Midichloria in ticks during blood-feeding provides new insights into a unique endobiosis

Aaron Jex, WEHI, Australia

Protein import into bacteria: how telomere phage toxins enter and kill klebsiella

Trevor Lithgow, Monash University Melbourne, Australia

12:20–13:00 | POSTER TEASER TALK 2 | AMPHITHEATRE

Chair: Almut Kelber

Using optogenetics to investigate extracellular matrix-encoded signals that orchestrate fibroblast heterogeneity

Srinivas Allanki, The Francis Crick Institute, United Kingdom

Cuticular hydrocarbon sensing mediates group formation in the clonal raider ant

Matteo Rossi, The Rockefeller University, United States of America

Neuronal communications through lipids; advances in mass spectrometry imaging for synaptoneurolipidomics of single cells

Reuben Young, University Of Wollongong, Australia

Building a single cell epigenetic oscillator

Amith Zafal Abdulla, Brandeis University, United States of America

Characterization of hydrogel matrix for evaluating schistosome egg migration

Kennedy Okeyo, Purdue University, United States of America

Sequencing carbohydrate chains one-at-a-time

Dhaneesh Kumar Gopalakrishnan, Max Planck Institute for Solid State Research, Germany

Photosynthetic energy transfer: Missing in action (–detected spectroscopy)?

Julian Lüttig, University of Michigan, United States of America

Engineering Next-Generation Proximity Labeling Enzymes for Spatial Proteomics in Living Cells

Chang Lin, Stanford University School of Medicine, United States of America

12:50–14:00 | LUNCH | LOUNGE AREA

14:00–15:00 | SPECIAL SESSION | AUDITORIUM

Apoptosis and clearance of dead cells

Invited Speaker: Shigekazu Nagata, Osaka University, Japan

15:00–16:40 | ORAL SESSION 5 | AUDITORIUM

Chair: Juliet Daniel

How animals produce vivid colours: new insights from reptiles

Devi Stuart-Fox, University of Melbourne, Australia

Dissecting viral protein multifunctionality – A path to understanding how deadly RNA viruses remodel the host cell

Angela Harrison, Monash University, Australia

Variant ribosomal DNA is essential for female differentiation in zebrafish

Timothy A. Hore, University of Otago, New Zealand

Capturing long-term hippocampal development in vitro using a novel stem cell-derived 3D brain organoid model system

Maria Giovanna Garone, Murdoch Childrens Research Institute, Australia

Mouse Lemur for a novel neuroscience model: A Cellular-Resolution Brain Atlas and Beyond

Jinhyun Kim, Korea Institute of Industrial Technology, Republic of Korea

16:40–17:10 | COFFEE BREAK | LOUNGE AREA

17:10–18:30 | ORAL SESSION 6 | AUDITORIUM

Chair: Paul Curmi

Exploring the microbial dark matter using electron cryotomography

Debnath Ghosal, University of Melbourne, Australia

Unraveling organ size determinants using limb-specific inter-species chimeras

Dr. Isha Goel, University of Cambridge, United Kingdom

Aphrogut: dissecting the process leading to yeast mating in social wasp intestines

Irene Stefanini, University of Turin, Italy

Chikungunya Virus-Mediated Modulation of Insect Cell Membrane Composition and Function

Nicholas Ariotti, University of Queensland, Australia

Friday, 11 July 2025

8:30–10:10 | ORAL SESSION 7 | AUDITORIUM

Chair: Barbara Pauly

Tumbleweed: an artificial motor protein that walks along a DNA track

Paul Curmi, University of New South Wales, Australia

Discovery and quantification of autocatalytic RNAs with generative models

Philippe Nghe, PSL Research University, France

Charting the lipidomic complexity of the synapse

Shane Ellis, University of Wollongong, Australia

Glil-expressing stromal cells are highly reparative precursors of long-lived chondroprogenitors in the fetal murine limb

Alberto Rosello-Diez, University of Cambridge, United Kingdom

T cell microvillus as a signaling organelle

Xiaolei Su, Yale University, United States of America

10:10–10:40 | COFFEE BREAK | LOUNGE AREA

10:40–12:00 | ORAL SESSION 8 | AUDITORIUM

Chair: Elyse Williams

From exploring the concept of adaptive immunity to viruses in mosquitoes to signatures of self-domestication

Mariangela Bonizzoni, University of Pavia, Italy

Unraveling the mechanisms of molecular resilience of neurons to cyclic mechanical stimulation

Vittoria Raffa, University of Pisa, Italy

The transcriptional program of golgi biogenesis

Roman Polishchuk, TIGEM, Italy

Stability Proteomics – a transformative experimental toolset for identification of protein–ligand interactions

Jerzy Dziekan, The Walter and Eliza Hall Institute of Medical Research, Australia

12:00–12:40 | POSTER TEASER TALK 3 | AMPHITHEATER

Chair: Juliet Daniel

Liposomal nanosensors for ultrasensitive neurochemical detection by mri

Vinay K Sharma, Massachusetts Institute of Technology, United States of America

Decoding the mechanisms of condensate-membrane interactions in changing environments: the focus on neuronal synapses

Dragomir Milovanovic, German Center for Neurodegenerative Diseases, Germany

mRNA Display Pipeline for Protein Biosensor Construction

Dr. Zhenling Cui, Queensland University of Technology, Australia

Identifying molecular determinants of global epistasis and protein superbinders by accurately screening and quantifying combinatorial deep mutational scanning libraries.

Pau Creixell, Cancer Research UK, United Kingdom

Visualization of dietary lipid transport through enterocytes

Yuki Naitou, Technical University of Dresden, Germany

Robust cytoplasmic partitioning by solving an intrinsic cytoskeletal instability

Melissa Rinaldin, Max Planck Institute of Molecular Cell Biology and Genetics, Germany

Unravelling the Mechanism of Intestinal Schistosome Egg Migration in a Complex Host Environment

Kennedy Okeyo, Purdue University, United States of America

Artificial Allosteric Protein Biosensors for Heart Failure Detection at Point-of-Care

Roxane Mutschler, Queensland University of Technology, Australia

12:50–14:00 | LUNCH | LOUNGE AREA

14:00–16:00 | POSTER SESSION 2 | EXHIBITION AREA

16:00–17:20 | ORAL SESSION 9 | AUDITORIUM

Chair: Mariangela Bonizzoni

Regulation of adipocyte hypertrophy and its impact on systemic metabolism

Siegfried Ussar, Helmholtz Center Munich–German Research Center for Environmental Health, Germany

Molecular definition of the endogenous Toll-like Receptor signaling pathway

Daniel Fisch, Boston Children's Hospital, Harvard Medical School, United States of America

Unlocking the Diets of Early Hominins: New Methods and Insights into the Onset of Meat Consumption and Brain Expansion

Tina Lüdecke, Max Planck Institute for Chemistry, Germany

The sweet sound of pollination: identifying plant responses to vibroacoustic signals produced by their pollinators

José Tomas Matus, Institute for Integrative Systems Biology, Spain

17:20–17:45 | FINAL REMARKS | AUDITORIUM

18:00–20:00 | FAREWELL SESSION | LOUNGE AREA

POSTER LIST

- 1 *Building a single cell epigenetic oscillator*
Amith Zafal Abdulla, Brandeis University, United States of America
- 2 *A Functional Genomics Approach to Study Human-Specific Neural Progenitor Cell Development*
Mai Ahmed, The Hospital for Sick Children, Canada
- 3 *Using optogenetics to investigate extracellular matrix-encoded signals that orchestrate fibroblast heterogeneity*
Srinivas Allanki, The Francis Crick Institute, United Kingdom
- 4 *Mitochondrial function regulates cellular growth rates to actively maintain mitochondrial homeostasis in dividing cells*
Vaishnavi Ananthanarayanan, University of New South Wales (UNSW) Sydney, Australia
- 5 *Measuring the Effect of Relatedness on the Evolution of Motility in Bacteria*
Lucy Binsted, University of Edinburgh, United Kingdom, United Kingdom
- 6 *High-throughput synthesis and evaluation of antiviral copolymers for enveloped respiratory viruses*
Nathan Boase, Queensland University of Technology (QUT), Australia
- 7 *Recording the history of cell-cell interactions in vivo*
Costanza Borrelli, The Rockefeller University, United States of America
- 8 *Shedding light on rhodopsin-mediated microbial phototrophy at the single-cell level*
Ariel Chazan, ETH Zurich, Switzerland
- 9 *Brain Tissue-on-a-chip platform to spatiotemporally regulate the cell-to-organ level communication*
Ann Na Cho, The University of Sydney, Australia, Australia
- 10 *Identifying molecular determinants of global epistasis and protein superbinders by accurately screening and quantifying combinatorial deep mutational scanning libraries*
Pau Creixell, Cancer Research UK Cambridge Institute, United Kingdom
- 11 *mRNA Display Pipeline for Protein Biosensor Construction*
Zhenling CUI, Queensland University Of Technology, Australia
- 12 *High-Throughput Prediction and Selection of Beta-Lactamase Variants with Enhanced Catalytic Activity Using DLKcat*
Cagla Ergun Ayva, Queensland University of Technology, Australia
- 13 *Methane formation driven by reactive oxygen species across all living organisms and the early Earth*
Leonard Ernst, Monash Biomedicine Discovery Institute, Australia
- 14 *As complex as necessary: human bladder tissue models to understand and fight infections*
Carlos Flores, Biozentrum, University of Basel, Switzerland

- 15 *Epigenetic homeostasis as oncogenic barrier during cell differentiation*
Cristina Fracassi, CNRS, France
- 16 *Unraveling organ size determinants using limb-specific inter-species chimeras*
Isha Goel, University of Cambridge, United Kingdom
- 17 *Sequencing carbohydrate chains one-at-a-time*
Dhaneesh Kumar Gopalakrishnan, Max Planck Institute for Solid State Research, Germany
- 18 *Is Quantum Coherence Important in Coupling the Antenna System to the Photosystem in Cryptophytes?*
Gesa Grüning, University of New South Wales (UNSW) Sydney, Australia
- 19 *Progress in our Understanding of Lysosomal Transporters*
Alvin Chun Yin Kuk, Duke-NUS Medical School, Singapore
- 20 *The atmosphere: a living, breathing ecosystem?*
Rachael Lappan, Biomedicine Discovery Institute, Monash University, Australia
- 21 *Exploring pancreatic progenitor-macrophage crosstalk during pancreatic development*
Christopher Lee, King's College London, United Kingdom
- 22 *Engineering Next-Generation Proximity Labeling Enzymes for Spatial Proteomics in Living Cells*
Chang Lin, Stanford University School of Medicine, United States of America
- 23 *Stress exacerbates glucose-insulin signalling dysfunction in duchenne muscular dystrophy*
Angus Lindsay, University of Canterbury, New Zealand
- 24 *Photosynthetic energy transfer: Missing in action (-detected spectroscopy)?*
Julian Lüttig, University of Michigan, United States of America
- 25 *Intracellular wiring for extracellular electron transfer: periplasmic nanowires made up of cytochromes exta in diverse environmentally important bacteria and archaea for exporting intracellular metabolic electrons to surface-displayed nanowires*
Nikhil Malvankar, Yale University, United States of America
- 26 *Bacteria going wireless: a widespread porin-cytochrome complex om(abc)b kickstarts microbial respiration and nanowire formation as a metabolic trade-off for efficient proteome allocation*
Nikhil Malvankar, Yale University, United States of America
- 27 *Structural phylogenetics and the evolution of the bacterial flagellum*
Nicholas Matzke, University of Auckland, New Zealand
- 28 *Decoding the mechanisms of condensate-membrane interactions in changing environments: the focus on neuronal synapses*
Dragomir Milovanovic, German Center for Neurodegenerative Diseases, Germany
- 29 *Artificial Allosteric Protein Biosensors for Heart Failure Detection at Point-of-Care*
Roxane Mutschler, Queensland University of Technology (QUT), Australia

- 30 *Visualization of dietary lipid transport through enterocytes*
Yuki Naitou, Technical University of Dresden, Germany
- 31 *Integrated gel stiffness characterization system for evaluating schistosome egg migration*
Kennedy Okeyo, Purdue University, United States of America
- 32 *Characterization of hydrogel matrix for evaluating schistosome egg migration*
Kennedy Okeyo, Purdue University, United States of America
- 33 *Unravelling the Mechanism of Intestinal Schistosome Egg Migration in a Complex Host Environment*
Martin Omondi, Kenya Institute of Primate Research, Kenya
- 34 *Hijacking Mosquitoes: Infection Dynamics of Dengue Virus in the Mosquito Brain*
Umberto Palatini, The Rockefeller University, United States of America
- 35 *Hybrid Exb/Mot stators require substitutions distant from the chimeric pore to power flagellar rotation*
Pietro Ridone, University of New South Wales (UNSW) Sydney, Australia
- 36 *Robust cytoplasmic partitioning by solving an intrinsic cytoskeletal instability*
Melissa Rinaldin, Max Planck Institute of Molecular Cell Biology and Genetics, Germany
- 37 *Cuticular hydrocarbon sensing mediates group formation in the clonal raider ant*
Matteo Rossi, The Rockefeller University, United States of America
- 38 *Liposomal nanosensors for ultrasensitive neurochemical detection by mri*
Vinay K Sharma, Massachusetts Institute of Technology, USA, United States of America
- 39 *Cross-Species Insights into Skeletal Muscle Homeostasis*
Hong-Wen Tang, Duke-NUS Medical School, Singapore
- 40 *Filming Insects in Action Using Fast Lock-On Tracking*
T. Thang Vo-Doan, The University of Queensland, Australia
- 41 *Probing the neural circuits for conscious awareness*
Jacob Westerberg, Netherlands Institute for Neuroscience, Netherlands
- 42 *Unravelling Archaea's Protein Degradation Network*
Joanna Whittaker, Uppsala University, Sweden
- 43 *The first pore structure of an independent and insecticidal Bacterial Exotoxin B protein Vpb4*
Raymond Wirawan, Monash Biomedicine Discovery Institute, Australia
- 44 *Neuronal communications through lipids; advances in mass spectrometry imaging for synaptoneurolipidomics of single cells*
Reuben Young, University Of Wollongong, Australia
- 45 *Nanoscale Curvature Enriches the Membrane-Associated Condensation of LAT/Grb2/SOS1*
Wenting Zhao, Nanyang Technological University, Singapore



Human Frontier Science Program Organization
12 Quai Saint Jean
67000 Strasbourg
France
www.hfsp.org

An aerial photograph of Melbourne, Australia, showing the city skyline with numerous skyscrapers in the background and the Melbourne Parliament House in the foreground, surrounded by green lawns and trees. A semi-transparent dark grey box is overlaid on the right side of the image, containing the event details.

24th HFSP Awardees Meeting

9–11 July 2025

Melbourne,
Australia