

Infectious Diseases Through an Evolutionary Lens

British Medical Association House, London, UK
17 – 19 October 2023

Programme

Day 1: Tuesday 17 October 2023

- 11:30** **Registration opens**
- 12:00 – 13:20** **Lunch**
- 13:30 – 13:45** **Welcome**
- Keynote speaker**
- 13:45 – 14:20** **Harmit Malik** Fred Hutchinson Cancer Center, USA
Fitness landscapes during adaptation in host-virus arms races
- Session I – Host response**
- 14:30 – 14:50** **Sonja Best** National Institutes of Allergy and Infectious Diseases, USA
New effector functions of the primate antiviral restriction factor TRIM5
- 15:00 – 15:20** **João Marques** Federal University of Minas Gerais, Brazil
Nucleic acid sensing during viral infection in *Drosophila* and vector mosquitoes
- 15:30 – 15:40** **Lucy Thorne** Imperial College London, UK
Evolution of enhanced innate immune suppression by SARS-CoV-2 variants of concern
- 15:45 – 16:10** **Coffee break and posters**
- 16:15 – 16:35** **Russell Vance** University of California, Berkeley, USA
Effector-triggered immunity during nuclear arms races with pathogens
- 16:45 – 17:05** **Lalita Ramakrishnan** University of Cambridge, UK
Mycobacterium tuberculosis pathogenicity viewed through the lens of molecular Koch's postulates
- 17:15 – 17:25** **Desmond Richmond-Buccola** Harvard Medical School, USA
Convergent mutations in phage virion assembly proteins enable evasion of Type I CBASS immunity
- 17:30 – 17:40** **Amy Goldberg** Duke University, USA
Integrating epidemiological and population-genetic models of *Plasmodium vivax* genomic variation
- 17:45 – 18:00** **Poster flash talks**
- 18:00 – 19:30** **Poster session**

Day 2: Wednesday 18 October 2023

Session II – Pathogen emergence and evolution

- 09:00 – 09:20** **Paul Sharp** The University of Edinburgh, UK
African ape origins of human malaras
- 09:30 – 09:50** **Alfred Amambua-Ngwa** MRC Unit The Gambia at LSHTM, The Gambia
Dynamics of antimalarial resistance evolution in *Plasmodium falciparum* from West Africa
- 10:00 – 10:10** **Teresa O'Meara** University of Michigan, USA
Evolution of outbreak potential and pathogenesis via a novel fungal adhesin
- 10:15 – 10:40** **Coffee break and posters**
- 10:45 – 11:05** **Linfa Wang** Duke-NUS Medical School, Singapore
The contrasting evolution story of bat-borne zoonotic viruses: coronaviruses versus henipaviruses
- 11:15 – 11:35** **Andrea Gamarnik** Fundación Instituto Leloir, Argentina
Flavivirus host adaptation and viral mechanisms of immune evasion
- 11:45 – 12:05** **Tyler Starr** The University of Utah, USA
Molecular evolution of SARS-CoV-2 and related bat coronaviruses
- 12:15 – 12:25** **Gemma Murray** University College London, UK
The emergence and diversification of a zoonotic pathogen from within the microbiota of intensively farmed pigs
- 12:30 – 13:35** **Lunch and posters**

Session III – Evolutionary history of human infectious disease

- 13:45 – 14:05** **Sarah Tishkoff** University of Pennsylvania, USA
Adaptation to infectious disease in Africa
- 14:15 – 14:35** **Kirsten Bos** Max Planck Institute for Evolutionary Anthropology, Germany
Ancient pathogen genomics
- 14:45 – 14:55** **Matthew Daugherty** University of California, San Diego, USA
Evolution of effector-triggered immune sensing of viral infection by the CARD8 and NLRP1 inflammasomes
- 15:00 – 15:10** **Group photo**
- 15:10 – 15:40** **Coffee break and posters**
- 15:45 – 16:05** **David Tobin** Duke University, USA
An ancestral bacterial effector promotes disseminated infections
- 16:15 – 16:35** **Heran Darwin** New York University, USA
Identification of a new vulnerability in *Mycobacterium tuberculosis*: what has evolution taught us?
- In conversation with**
- 16:45 – 17:30** **Katherine Wu** The Atlantic, USA
In conversation with Sara Cherry
- 17:30 – 17:45** **Poster flash talks**
- 17:45 – 19:15** **Poster session**
- 19:15** **Dinner at Camino, King's Cross**

Day 3: Thursday 19 October 2023

Session IV – Evolutionary insights from diverse host responses

- 09:00 – 09:20** **Judi Allen** The University of Manchester, UK
Type 2 immunity and tissue repair: learning from helminths
- 09:30 – 09:50** **Nels Elde** The University of Utah, USA
Infection biology in zebrafish
- 10:00 – 10:20** **Emily Troemel** University of California, San Diego, USA
C. elegans host response to infection by the Orsay virus and microsporidia
- 10:30 – 10:55** **Coffee break**

Session V – Evolution of virulence traits

- 11:00 – 11:20** **Philip Kranzusch** Harvard University, USA
Evolution of antiviral immunity
- 11:30 – 11:50** **Sara Cherry** University of Pennsylvania, USA
Defining the interface between RNA biology and emerging RNA viruses
- 12:00 – 12:10** **Mary Petrone** University of Sydney, Australia
Evidence for an ancient aquatic origin of the RNA viral order Articulavirales
- 12:15 – 12:25** **Tera Levin** University of Pittsburgh, USA
Dynamics of bacterial virulence gene evolution via HGT
- 12:30 – 13:35** **Lunch**

Session VI – Clinical consequences and therapeutic opportunities

- 13:45 – 14:05** **Brenda Kwambana-Adams** Liverpool School of Tropical Medicine, UK
Linking prolonged carriage, adaptive evolution and the emergence of antimicrobial resistance in *Streptococcus pneumoniae*
- 14:15 – 14:35** **Vanessa Sancho-Shimizu** Imperial College London, UK
Inborn errors of immunity: human genetic insights on understanding life-threatening infections
- 14:45 – 14:55** **Stephen Goldstein** The University of Utah, USA
Rise and fall of horizontally acquired host genes during coronavirus evolution
- 15:00 – 15:25** **Coffee break**
- 15:30 – 15:40** **Aïda Nitsch** University of Turku, Finland
How do epidemics spread? A comparative study of the spatio-temporal dynamics of childhood diseases across pre-health care Nordic countries
- 15:45 – 16:05** **Wendy Barclay** Imperial College London, UK
Evolution of pandemic influenza
- 16:15 – 16:35** **Stephen Russell** Mayo Clinic, USA
Targeting virus attachment and entry for biomedical applications
- 16:45** **Closing remarks**