



## Programme

### Organizers:

Marta Bally  
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Susan Daniel  
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Universidad Autónoma de Madrid, Madrid, Spain

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Cornell University, Ithaca, NY, USA

# Pre-conference programme

## Sunday, 1 June

17:00-19:30 Registration

20:00 *WELCOME COCKTAIL*

20:30-22:00 *DINNER*

## Breakfast

Breakfast is served every conference day from 7:30 to 10:00.

# Programme Monday, 2 June

- 8:30-8:35 Welcome by the chairs  
8:35-8:50 Welcome from FEBS (*Zrinka Kovarik and Julia Hansen*)  
8:50-9:00 General information

## Session I: Physical virology at the length scale of viral macromolecules

*Chair: Steve Bonilla*

- 9:00-9:05 Introduction to Session I
- 9:05-9:50 Structural dynamics of multiprotein complexes: viral assemblies and the Vault particle  
Nuria Verdaguer, Molecular Biology Institute of Barcelona, IBMB-CSIC, Spain
- 9:50-10:35 Packaging and discovering RNA bacteriophage genomes  
Rees Garmann, San Diego State University, CA, United States
- 10:35-11:10 *COFFEE / POSTER VIEWING*

## EMBO Young investigator lecture

- 11:10-11:55 Learning the RNA Jigsaw Rules from Viruses with Multi-segmented Genomes'  
Alexander Borodavka, University of Cambridge, United Kingdom
- 11:55-12:15 The metabolite IP6 modulates the energy landscape and promotes pore opening in the protein lattice of the HIV-1 capsid  
Alejandro Valbuena, Universidad Autónoma de Madrid, Spain

## Science policy lecture

- 12:15-13:00 Science as Service: how to use storytelling to bridge the gap between your science and community impact  
Heather Masson-Forsythe, Science Policy and Communications, VA, US

- 13:00-15:05 *LUNCH / FREE TIME*  
15:05-15:35 Meet the Speakers from Session I

## Cont. Session I: The proteins..

- 15:40-16:00 From Validation To Prediction: A Biophysical Tool For Mapping SARS-CoV-2 Variant Evolution  
Fernando Luis Barroso da Silva, University of Sao Paulo, Brazil
- 16:00-16:45 Simultaneous polyclonal antibody sequencing and epitope mapping by cryo electron microscopy and mass spectrometry  
Joost Snijder, Utrecht University, the Netherlands

## Session II: Physical virology at the length scale of the viral particle

*Chair: Ekaterina Selivanovitch*

- 16:45-16:50 Introduction to Session II
- 16:50-17:10 Revealing the mechanisms of virus assembly with single-particle kinetics  
Pedro Buzón, University of Zurich, Switzerland
- 17:10-17:30 *COFFEE / POSTER VIEWING*
- 17:30-18:15 Icosahedral viruses through the computational  
Jodi Hadden-Perilla, University of Delaware, DE, United States
- 18:15-18:35 Molecular simulations of nucleic acid packaging in viruses  
Kush Coshic, Max Planck Institute of Biophysics, Germany
- 18:35-18:55 RNA polarization under icosahedral confinement  
Horacio Guzman, Instituto de Ciencia de Materiales de Barcelona, Spain
- 18:55-19:05 *SHORT BREAK*
- 19:05-19:50 Dynamic nanomachines: Unravelling a virus maturation pathway through cryo-EM  
Roger Castells-Graells, Spanish National Cancer Research Centre, Spain
- 19:50-21:00 *DINNER*
- 21:00-22:30 Poster session I

## Programme Tuesday, 3 June

### Cont. Session II: The particle..

9:00-9:45 Structural diversity of archaeal viruses  
Mart Krupovic, Institut Pasteur, France

### Session III: Physical virology at the length scale of the host cell

*Chair: Juliana Carten*

9:45-9:50 Introduction to Session III

9:50-10:35 More than simple adhesion: Interactions between glycans and small DNA tumor viruses for cell entry  
Mario Schelhaas, Universität Münster, Germany

10:35-10:55 Structure of a thermostable phage's portal vertex and neck complex illuminates its maturation process  
Brian Kelch, University of Massachusetts, MA, United States

10:55-11:30 *COFFEE / POSTER VIEWING*

11:30-12:15 New Tools and Mechanistic Insights into Viral Fusion  
Raya Sorkin, Tel Aviv University, Israel

12:15-13:00 A nanoscale view on virus infection  
Christian Sieben, Helmholtz Centre for Infection Research, Germany

13:00-15:25 *LUNCH / FREE TIME*

15:25-15:55 Meet the Speakers from Session II and III

### Cont. Session III: The host cell

16:00-16:20 Interfacial Partitioning of Conserved Tyrosine Y819 Optimally Positions the SARS-CoV-1 Fusion Peptide during Host Cell Membrane Interactions and Entry  
Ambika Pachaury, Cornell University, NY, United States

16:20-16:40 Membrane composition asymmetry is a defense mechanism against viral infection  
Gonen Golani, University of Haifa, Israel

#### **Session IV: Advanced methods for virology**

*Chair: Dario Conca*

16:40-16:45 Introduction to Session IV

16:45-17:05 Snapshot of adenovirus disassembly reveals a portal-like structure and reorganization of internal capsid and core proteins  
Marta Martinez, The National Center for Biotechnology, Spain

17:05-17:30 *COFFEE / POSTER VIEWING*

17:30-18:15 "Locking on" to single viruses with 3D active-feedback microscopy  
Kevin Welsher, Duke University, NC, United States

18:15-18:25 *SHORT BREAK*

#### **Sponsor talk**

18:25-18:55 Utilizing Multi-Parametric Surface Plasmon Resonance (MP-SPR) and Quartz Crystal Microbalance with Dissipation Monitoring (QCMD) for Real-Time Analysis of Virus-Peptide Interactions  
Justas Svirelis, BioNavis, Finland

18:55-19:15 Variant-specific Interactions at the Plasma Membrane: Heparan Sulfate's Impact on SARS-CoV-2 Binding Kinetics  
Dario Conca, Umeå University, Sweden

19:15-19:35 Examining virus-cell interactions via confocal iSCAT microscopy  
David Albrecht, Max Planck Institute for the Science of Light, Germany

19:35-21:00 *DINNER*

21:00-22:30 Poster session II

## Programme Wednesday, 4 June

### Cont. Session IV: Advanced methods for virology

9:00-9:45 4D single particle microscopy and AI Synergy: A new era in studying virus and other biologicals cell entry mechanisms  
Nikos S. Hatzakis, University of Copenhagen, Denmark

### The EMBO Women in science lecture

9:45-10:30 Understanding and breaking barriers for women in science  
Cristina Gomez-Navarro, Universidad Autónoma de Madrid, Spain

10:30-11:05 *COFFEE / POSTER VIEWING*

### Session V: Advanced materials inspired by viruses

*Chair: Irina Tsvetkova*

11:05-11:10 Introduction to Session V

11:10-11:30 Magic sizes enable minimal-complexity, high-fidelity assembly of programmable shells  
Botond Tyukodi, Babes-Bolyai University, Romania

11:30-12:15 High-fidelity *in vitro* assembly & cargo packaging in encapsulin protein cages  
Yu Heng Lau, University of Sydney, Australia

12:15-13:00 Cell-free synthesis of viral membrane proteins for vaccine nanocarriers  
Neha Kamat, Northwestern University, IL, United States

13:00-13:20 An assembly-line mechanism for *in vitro* encapsulation of fragmented cargo in virus-like particles  
Ayesha Amjad, Indiana University, IN, United States

13:20-19:45 *LUNCH / FREE TIME*

19:45-21:00 *DINNER*

21:00-22:30 Poster session III

## Programme Thursday, 5 June

### Cont. Session V: Advanced materials inspired by viruses

- 9:00-9:45 Virus-like particles at the interface of soft materials  
Frank Sainsbury, Griffith University, Australia
- 9:45-10:30 Functionalized viral protein assemblies as scaffolds for neural tissue engineering  
Laura Palomares, Universidad Nacional Autónoma de México. Mexico
- 10:30-10:50 Multiple-enzyme kinetics in single monodisperse nanoreactors unveil correlations between broadly distributed catalytic rates  
Klara Strobl, Universidad Autónoma de Madrid, Spain

10:50-11:15 *COFFEE*

### Panel discussion

- 11:15-12:15 Panel discussion and future perspectives  
*Moderators: Ekaterina Selivanovitch and Karim Rafie*

### Session VI: Physical virology in therapeutics and diagnostics

*Chair: Yusuke Azuma*

- 12:15-12:20 Introduction to Session VI
- 12:20-13:05 Dissection of enveloped virus membrane fusion mechanisms using cell-free assays  
Enya Qing, Loyola University Chicago, IL, United States
- 13:05-15:25 *LUNCH / FREE TIME*
- 15:25-15:55 Meet the Speakers from Session IV, V, VI

## Cont. Session VI: Physical virology in therapeutics and diagnostics

- 16:00-16:20 Revealing SARS-CoV-2 replication transcription super-complex (RTC) architecture and dynamics via native MS  
Fatema-Aqila Said, Center for Structural Systems Biology (CSSB)/Deutsches Elektronen-Synchrotron (DESY), Germany
- 16:20-17:05 Novel bioelectronic devices for screening viral interactions; at both cell membrane and tissue level  
Roisin Owens, University of Cambridge, United Kingdom
- 17:05-17:25 Bacteriophage T7: link between a virtual and an experimental, atomic force microscope (AFM)  
Maria Aznar Palenzuela, Universidad de La Laguna, Spain
- 17:25-18:00 *COFFEE*
- 18:00-18:45 Chemical interactions of empty/full AAV capsids measured with single particle AFM  
Caryn Heldt, Michigan Technological University. MI, United States
- 18:45-19:05 Concluding remarks
- 19:30- *CONFERENCE DINNER*



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