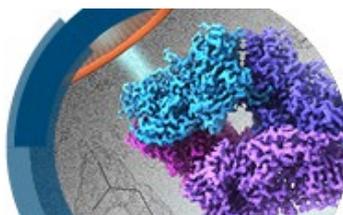


Challenges in biological cryo electron microscopy

Faraday Discussion



13-15 July 2022
Sheffield, UK and Online

13 July 2022 (all timings are BST)

11:30	Registration, tea and coffee
12:30	Lunch
13:30	Welcome and Introductions Stephen Muench, <i>Chair of Scientific Committee</i>
13:40	Outline of Discussion format Esther Johnston and Ella White, <i>Royal Society of Chemistry Publishing</i>
13:45	Introductory Lecture (Spiers Memorial Lecture) (Session Chairs: Vicki Gold and Stephen Muench) Helen Saibil <i>Birkbeck, University of London, UK</i>
14:45	Afternoon tea
	Session 1: Sample preparation in single particle cryo-EM (Session chairs: Stephen Muench and Corinne Smith)
15:15	Thin films and their implications for cryoEM structure determination Rebecca Thompson <i>University of Leeds, UK</i>
15:20	Towards sub-millisecond cryo-EM grid preparation <u>David Klebl</u> ** , Robert W. Kay, Frank Sobott, Nikil Kapur, and Stephen P. Muench <i>University of Leeds, UK</i>
15:25	Customising the plunge-freezing workflow for challenging conditions <u>Saskia Bakker</u> and Ian Hands-Portman <i>University of Warwick, UK</i>
15:30	Discussion
16:45	Flash poster presentations
	RSC Chemical Biology Esther Johnston, <i>Royal Society of Chemistry Publishing</i>
17:30	Poster session and wine reception Kindly sponsored by: 
18:30	End of day

** presenting online

14 July 2022 (all timings are BST)

	Session 1 continued: Sample preparation in single particle cryo-EM (Session Chairs: Corinne Smith and Stephen Muench)
09:15	Arrival refreshments
09:30	cryoWriter: A blotting free cryo-EM preparation system with climate jet and cover-slip injector Thomas Braun, Luca Rima, Michael Zimmermann, Andri Fränkl, Thomas Clairfeuille, Matthias Lauer, Andreas Engel, Hans-Andreas Engel <i>University of Basel, Switzerland</i>
09:35	Cryo-EM samples of gas-phase purified protein assemblies using native electrospray ion-beam deposition Tim Esser, Jan Böhning, Paul Fremdling, Tanmay Bharat, Joseph Gault, Stephan Rauschenbach <i>University of Oxford, UK</i>
09:40	Discussion
10:30	Morning coffee
	Session 2: Tomographic analysis, CLEM (Session Chairs: Per Bullough and David Bhella)
11:00	Strategies for picking membrane-associated particles within subtomogram averaging workflows Giulia Zanetti, Euan Pyle, Joshua Hutchings <i>Birkbeck, University of London, UK</i>
11:05	Bridging length scales from molecules to the whole organism by cryoCLEM and cryoET René A. W. Frank, Megan Lovatta, Conny Leistnera <i>University of Leeds, UK</i>
11:10	Diffraction contrast in cryo-scanning transmission electron tomography reveals the boundary of hemozoin crystals <i>in situ</i> Debakshi Mullick, Katya Rechav, Leslie Leiserowitz, Neta Regev-Rudzki, Ron Dzikowskie and Michael Elbaum <i>Weizmann Institute of Science, Israel</i>
11:15	Discussion
12:30	Lunch
	Session 3: Map/model validation and machine learning in EM (Session Chairs: Paula da Fonseca and Per Bullough)
14:00	Reconstruction and validation of entire virus model with complete genome from mixed resolution cryo-EM density Dmitry Nerukh, Vladimir S. Farafonov, Michael Stich <i>Aston University, UK</i>
14:05	Electron scattering properties of biological macromolecules and their use for cryo-EM map sharpening Arjen J. Jakobi** and Alok Bharadwaj <i>Kavli Institute of Nanoscience, Delft University of Technology, Netherlands</i>
14:10	Discussion
15:00	Afternoon Tea
	Session 3 continued: Map/model validation and machine learning in EM (Session Chairs: Per Bullough and Paula da Fonseca)
15:30	The impact of AlphaFold2 on experimental structure solution Andrea Thorn**, Maximilian Edich, David C. Briggs, Oliver Kippes, Yunyun Gao <i>University of Hamburg, Germany</i>
15:35	Overview and applications of map and model validation tools in the CCP-EM software suite Agnel Praveen Joseph**, Sony Malhotra, Tom Burnley, and Martyn D Winn <i>STFC, UK</i>

15:40	Image processing tools for the validation of CryoEM maps <u>José Luis Vilas</u> , Carlos Oscar S. Sorzano, E. Ramírez-Aportela, J. Krieger, D. del Hoyo, D. Herreros, E. Fernandez-Giménez, D. Marchán, J.R. Macías, I. Sánchez, L. del Caño, Y. Fonseca-Reyna, P. Conesa, A. García-Mena, J. Burguet, J. García Condado, J. Méndez García, M. Martínez, A. Muñoz-Barrutia, R. Marabini, J. Vargas, J.M. Carazoa <i>Natl. Center for Biotechnology CSIC, Spain</i>
15:45	Discussion
17:00	Close of sessions
18:30	Pre-dinner drinks – Halifax Hotel
19:00	Conference dinner – Halifax Hotel

** presenting online

15 July 2022 (all timings are BST)

	Session 4: Pushing the limits in single particle cryo-EM (Session chairs: David Bhella and Vicki Gold)
08:45	Arrival refreshments
09:00	High-throughput cryo-EM structure determination of amyloids <u>Sjors Scheres</u> and Sofia Lövestam <i>Laboratory of Molecular Biology - MRC</i>
09:05	Application of super-resolution and correlative double sampling in cryo-electron microscopy <u>Daniel Clare</u> , Yuewen Sheng, Peter J. Harrison, Vinod Vogirala, Zhengyi Yang, Claire Strain-Damerell, Thomas Frozio, Benjamin A. Himes, C. Alistair Siebert, Peijun Zhang <i>Electron Bio-Imaging Centre, Diamond Light Source, UK</i>
09:10	Discussion
10:00	Morning coffee
	Session 4 continued: Pushing the limits in single particle cryo-EM (Session chairs: Vicki Gold and David Bhella)
10:30	Cryomicroscopy <i>in situ</i>: What is the smallest molecule that can be directly identified without labels in a cell? <u>Christopher J. Russo</u> , Joshua L. Dickerson, Katerina Naydenova <i>Laboratory of Molecular Biology – MRC, UK</i>
10:35	Escaping the symmetry trap in helical reconstruction <u>Bertram Daum</u> , Lavinia Gambelli, Michail N. Isupov <i>Living Systems Institute, University of Exeter, UK</i>
10:40	Discussion
11:30	Concluding Remarks Lecture (Session Chair: Stephen Muench) Werner Kühlbrandt <i>Max Planck Institute of Biophysics, Germany</i>
12:10	Acknowledgements
12:15	Close of meeting and lunch

Presenting authors are indicated in the programme by an underline. The affiliation is for the presenting author.

** presenting online