Wellcome-iNEXT Cryo-EM in Structural Biology 2024

28th – 31st May 2024

In-person / hybrid event

Organisers: Lorna Malone (eBIC), Karen Davies (eBIC) & Anna Rackley (eBIC)

Day 1: Tuesday

09:00–09:15	Arrival at **RAL reception (R75)** for students and external visitors
09:15–09:30	**Welcome Coffee (G59)**
09:30–10:00	Introductions and welcome – **Martin Walsh (DLS)** (G59)
10:00–11.00	**Lecture 1:** An introduction to cryo-electron microscopy (cryo-EM) – **Karen Davies (eBIC)** (G59)
11:00–12:00	**Lecture 2:** Image formation in the electron microscope – **Dan Clare (eBIC)** (G59)
12:00–13:00	**Lunch break**
13:00–14:00	**Lecture 3**: Sample Preparation for Single Particle Analysis – **Peter Harrison** (pre-recorded) (G59)
14:00–15:00	**Lecture 4:** Screening Strategies in SPA – **Rebecca Thompson (TFS)** (G59)
15:00–15:15	**Coffee break (G59)**
15:15–16:00	*** Demo Session 1:** Sample Preparation for SPA (pre-recorded) – **Kyle Morris** (G59)
16:00–18:00	*** Demo Session 2:** SPA Screening and Data Collection – **Éilís Bragginton** (G59)
18:00 – 18:05	**Group Photo** (Diamond Atrium)
18:05 -	**Free Evening**

Day 2: Wednesday

09:00–09:15	**Arrival & Morning Coffee (G59)**
	Orientation & day overview - **Lorna Malone (eBIC)** (G59)
09:15–09:20	Health & Safety Talk – **Karen Davies (eBIC)** (G59)
09:20–09:30	*** Practical Session 1**:
09:45–10:45	**Group 1** – Sample Preparation for SPA using a Vitrobot **(I14 G27)**
	Group 2 & 3 – Sample Preparation for SPA using a Vitrobot **(synchrotron, Lab 11)**
	Group 4, 5 & 6 – SPA screening and data collection on a Krios **(I14 Control room)**
	*** Practical Session 2**:
11:00–12:00	**Group 1, 2 & 3** – SPA screening and data collection on a Krios **(I14 Control room)**
	Group 4 & 5 – Sample Preparation for SPA using a Vitrobot **(synchrotron, Lab 11)**
	Group 6 – Sample Preparation for SPA using a Vitrobot **(I14 G27)**
12:00–13:00	**Lunch break**
13:00–14:00	**Lecture 5:** Image processing theoretical introduction **– Matt Iadanza (CCP-EM)** (G59)
14:00–15:00	**Lecture 6:** SPA processing pipelines – **Daniel Hatton (DLS/eBIC)** (G59)
15:00–15:15	**Coffee break (G59)**
15:15–16:15	**Lecture 7:** Structural Heterogeneity in SPA Datasets – **Yuriy Chaban (eBIC)** (G59)
16:15–17:15	**Lecture 8**: Fitting and building of atomic models – **Agnel-Praveen Joseph (CCP-EM)** (G59)
17:15 –	**Free Evening**

Day 3: Thursday

09:00–09:15	**Arrival & Morning Coffee (G59)**
09:15–09:30	Orientation & day overview - **Lorna Malone (eBIC)** (G59)
10:00–11:00	**Lecture 9**: An Introduction to cryo-ET - **Kyprianos Hadjidemetriou (eBIC)** (G59)
11:00–12:00	**Lecture 10**: Sample Preparation and Screening for cryoET **– Michael Grange (RFI)** (G59)
12:00–13:00	**Lunch break**
13:00–14:00	**Lecture 11:** *In situ* structure determination using Cryo-FIB-SEM **– James Gilchrist (eBIC)** (G59)
14:00–15:30	*** Demo Session 3:** Sample Preparation for cryo-ET **Group 1, 2 & 3** – Sample Preparation for Cryo-ET (HPF and Micropatterning) **Group 4, 5 & 6** – Cryo-ET screening and data collection on a Krios **(I14 Control room)**
15:30–15:45	**Coffee break (G59)**
15:45–17:15	*** Demo Session 4:** Sample Preparation for cryo-ET **Group 4, 5 & 6** – Sample Preparation for Cryo-ET (HPF and Micropatterning) **Group 1, 2 & 3** – Cryo-ET screening and data collection on a Krios **(I14 Control room)**
17:15 –	**Dinner (The Bear, Wantage)**

Day 4: Friday

09:30–09:45	**Arrival & Morning Coffee (G59)**
10:00–12:00	*** Practical 3: Parallel Practicals:** Group 1 & 2 – CryoET Data Collection on Krios I **(I14 Control room)** Group 3 & 4 – CryoET Data Collection on Krios II **(I14 Control room)** Group 5 & 6 – CryoET Data Collection on Krios IV **(I14 Control room)**
12:00–13:00	**Lunch break**
13:00–14:00	**Lecture 12**: Cryo-ET processing pipelines – **Daniel Hatton (DLS/eBIC)**
14:00–15:00	**Lecture 13**: Averaging and reconstructing 3D maps in cryo-ET – **Alister Burt (Genentech)**
15:00–15:15	**Coffee break (G59)**
15:15–16:15	*** Student Presentations:** Student learning & feedback talks
16:15–17:15	* Wrap Up Q&A Discussion

End of Course

Lectures will be held in Diamond House G59 and broadcast to the community via Zoom.
(*) Practical sessions, demonstrations, feedback talks and wrap-up Q&A for in-person participants only.