Cryo ET Tomography & Subtomogram Averaging — Hands-on

Develop a working understanding of cryo electron tomography (cryo ET) and subtomogram averaging. You will see how 3D volumes are reconstructed from tilt series, how particles are detected and aligned in tomograms, and how classification and averaging reveal structures of macromolecular complexes in their native context.

Cryo ET Tomography & Subtomogram Averaging

Help Desk · WhatsApp

Session Index

Session 1 — Cryo ET Principles & Tilt Series Acquisition   Session 2 — Tilt Series Alignment & Tomogram Reconstruction   Session 3 — Subtomogram Picking, Classification & Averaging   Session 4 — Interpretation, Validation & Integrative Modeling

Session 1
Fee: Rs 8800   Apply Now
Cryo ET Principles & Tilt Series Acquisition

Cryo ET concepts and use cases

cellular tomography   in situ macromolecular complexes   comparison to single particle cryo EM

Tilt series acquisition strategies

tilt schemes and angular coverage   dose distribution along tilt   missing wedge effects

Sample preparation and lamella considerations

thickness and milling overview fiducials and landmarks grid navigation concepts

Session 2
Fee: Rs 11800 Apply Now

Tilt Series Alignment & Tomogram Reconstruction

Preprocessing and CTF for tilt series

frame alignment for high tilt images per tilt CTF estimation dose dependent filtering ideas

Alignment using fiducials or patch tracking

fiducial selection and tracking warping and tilt axis refinement alignment quality metrics

Tomogram reconstruction methods

weighted back projection SIRT like approaches binning, cropping and denoising

Session 3
Fee: Rs 14800 Apply Now

Subtomogram Picking, Classification & Averaging

Particle and region of interest picking in tomograms

template based and manual picking segmentation assisted picking coordinate management

Subtomogram extraction and alignment

box size and binning choices initial alignment strategies handling of missing wedge

Classification and averaging workflows

heterogeneity analysis FSC and resolution

estimation   map sharpening and filtering

Session 4
Fee: Rs 18800 Apply Now

Interpretation, Validation & Integrative Modeling

Biological interpretation of tomograms and averages

Theory + Practical

Validation and reporting for subtomogram averages

geometry and map quality checks global and local resolution plots deposition considerations

Integrative use with models and complementary data

docking of atomic models overlay with fluorescence or segmentation figure panels and methods text