

Cryo EM Map to Model Fitting & Real Space Refinement — Hands-on

Gain practical skills in cryo EM map to model pipelines, from understanding maps and resolution to fitting, refining and validating atomic models in real space. This module walks through inspection of cryo EM maps, initial rigid body and flexible fitting, iterative real space refinement, validation metrics and preparation of deposition ready structures and figures.

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Session 1

Fee: Rs 8800 [Apply Now](#)

Cryo EM Maps, Resolution & Features

Cryo EM maps and resolution concepts

[map formats and voxel size](#) [global and local resolution](#) [FSC curves and filtering ideas](#)

Visual inspection and map preparation

[contour levels and noise assessment](#) [sharpening and blurring strategies](#) [segmentation and masking](#)

overview

Recognising map features at different resolutions

secondary structure elements side chain visibility
range ligand and cofactor densities

Session 2

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Initial Model Placement & Rigid Fitting

Starting models and homology inputs

choice of PDBs or predicted models sequence
alignment and trimming domain and subunit
segmentation

Rigid body fitting and docking into maps

manual docking workflows automatic fitting tools
overview cross correlation based scores

Building a consistent assembly model

symmetry and biological assemblies interfaces and
clashes check saving intermediate models safely

Session 3

Fee: Rs 14800 Apply Now

Real Space Refinement & Flexible Fitting

Local rebuilding and flexible fitting concepts

adjusting loops and side chains secondary structure
restraints handling low resolution regions

Real space refinement workflows

geometry and stereochemistry checks map model
correlation optimisation weighting and restraint

strategies

Ligands, cofactors and waters in cryo EM maps

identifying convincing density **parameterisation and restraints overview** **avoiding over interpretation of features**

Session 4

Fee: Rs 18800 Apply Now

Validation, Deposition & Case Study

Map model validation metrics

global and local fit scores **geometry and clash scores** **overfitting and cross validation ideas**

PDB and EMDB deposition readiness

file organisation and naming **metadata and annotation checklist** **common validation server outputs**

End to end cryo EM map to model case study

from map inspection to refined model **figures for manuscripts and talks** **documenting decisions and limitations**