Structural Biology Foundations & Experimental Overview — Hands-on

Build a strong foundation in structural biology and the major experimental modalities used to determine biomolecular structure. You will understand how X-ray crystallography, cryo-EM, NMR and SAXS complement each other, how data are generated and interpreted, and how structures are validated and deposited in public repositories.

Structural Biology Foundations & Experimental Overview

Help Desk · WhatsApp

Session Index

Session 1

Fee: Rs 8800 Apply Now

Structural Biology Landscape & Core Concepts

Biomolecular structure hierarchy and biophysics

primary / secondary / tertiary / quaternary **proteins, nucleic acids, complexes** **folding & stability concepts**

Resolution, data quality and model interpretation

resolution & map detail **B-factors & uncertainty**

validation metrics

Repositories and data standards

PDB EMDB BMRB / SASBDB

Session 2

Fee: Rs 11800 Apply Now

X-ray Crystallography & Diffraction Basics

From sample to crystal and data collection

protein expression & purification overview crystallization screening beamlines & detectors

Diffraction, indexing and phasing concepts

Bragg diffraction & reciprocal space space groups & symmetry phasing strategies overview

Electron density maps and refinement overview

2Fo-Fc / Fo-Fc maps R-factors & geometry checks common pitfalls

Session 3

Fee: Rs 14800 Apply Now

Cryo-EM, NMR & SAXS Overview

Cryo-EM single particle analysis concepts

vitrification & grids micrographs & particle picking 2D/3D classification

NMR spectroscopy for biomacromolecules

chemical shifts & assignments NOEs & restraints solution dynamics

SAXS and low resolution shape information

I(q) curves & Guinier analysis Rg, Dmax & envelopes

hybrid modeling idea

Session 4

Fee: Rs 18800 Apply Now

Integrated Case Study & FAIR Reporting

Choosing modalities and designing an experiment

Theory + Practical walk-through

Reading and annotating a structure entry

PDB / EMDB viewers metadata & experimental details limitations & caveats

Deliverables: mini report, figure panels & checklist

PDF/HTML summary figure exports FAIR data checklist