SAXS Solution Scattering & Hybrid Modeling — Hands-on

Learn how small angle X ray scattering (SAXS) reports on biomolecular size, shape and flexibility in solution. This module walks through experiment design, data reduction, quality assessment, low resolution modeling and hybrid use of SAXS with crystallography, cryo EM and NMR to build integrative structural models.

SAXS Solution Scattering & Hybrid Modeling

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Session Index

Session 1

Fee: Rs 8800 Apply Now

SAXS Fundamentals & Experiment Design

Principles of solution scattering and SAXS observables

q space and I(q) **contrast and scattering length density** **size, shape and flexibility information**

Sample preparation and experiment planning

monodispersity and aggregation checks **concentration series** **buffer matching and background**

SAXS beamline and lab instrument overview

flow cell vs batch | radiation damage considerations | time resolved and SEC SAXS concepts

Session 2

Fee: Rs 11800 Apply Now

Data Reduction, QC & Guinier / Kratky Analysis

From 2D images to 1D scattering curves

radial averaging | buffer subtraction | merging frames and curves

Guinier, distance distribution and Kratky plots

Rg and I(0) estimation | P(r) and Dmax | folded vs disordered signatures

Quality control and data selection

monodispersity checks | frame rejection and outliers | reproducibility across concentrations

Session 3

Fee: Rs 14800 Apply Now

Shape Reconstruction & Rigid Body Modeling

Ab initio shape reconstruction from SAXS curves

dummy atom and bead models | symmetry and anisometry | clustering and averaging solutions

Rigid body and ensemble modeling strategies

fitting high resolution domains | flexible linkers and ensembles | comparison of candidate models

Goodness of fit and model discrimination

chi squared and residuals | q range selection | overfitting considerations

Session 4

Fee: Rs 18800 Apply Now

Hybrid / Integrative Modeling & Reporting

Combining SAXS with high resolution structures

Theory + Practical

Integrative use with crystallography, cryo EM and NMR

consistency checks across methods **restraint based hybrid models** **model uncertainty communication**

Deposition, FAIR data and figure ready reporting

SASBDB deposition concepts **checklists and validation summaries** **panels and methods text for manuscripts**