# Hydrogen-Deuterium Exchange (HDX) and Footprinting — Hands-on

Gain a strong conceptual understanding of hydrogen–deuterium exchange (HDX) and footprinting approaches used to probe protein dynamics, conformational changes and interaction surfaces. This module focuses on protection patterns, experiment planning, LC–MS readout ideas and how HDX/footprinting maps are interpreted as structural and functional constraints.

## Hydrogen-Deuterium Exchange (HDX) and Footprinting

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**Session Index**



**Session 1**

**Fee: Rs 8800** Apply Now

### HDX & Footprinting Foundations

Basic principles of hydrogen–deuterium exchange in proteins

**backbone amide exchange concepts** **protection by structure and binding** **global vs local exchange thinking**

Chemical and covalent footprinting ideas

**solvent accessibility concepts** **residue reactivity**

thinking | mapping exposed vs protected regions

When to use HDX vs footprinting approaches conceptually

conformational dynamics questions | ligand and partner binding studies | complementing structure and MD simulations

Session 2

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## Experimental Design & Labelling Strategies (Concepts)

HDX experiment planning at conceptual level

labelling time course ideas | temperature and pH thinking | global vs peptide level readout concept

Footprinting reagent and exposure concepts

mild vs more aggressive conditions | time and concentration thinking | controlling extent of modification (overview)

Controls, replicates and comparison conditions (idea level)

apo vs ligand bound states | mutant or buffer controls | biological vs technical replicate concepts

Session 3

Fee: Rs 14800 Apply Now

## Data Acquisition & Protection Pattern Concepts

HDX and footprinting LC–MS readout at high level

peptide level mass shift ideas | exchange vs back exchange awareness | modified vs unmodified peptide patterns

Protection and exposure patterns as structural signals

stabilization upon binding concepts | regions gaining

flexibility allosteric change thinking

Comparative HDX/footprinting maps between states (idea level)

difference plots concepts significance threshold thinking linking regions to function and interfaces

Session 4

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## Mini Capstone: From HDX/Footprinting Map to Interpretation

Mapping HDX/footprinting patterns onto protein models (conceptual)

Theory + Practical (planning oriented)

Interpreting binding sites, epitopes and allosteric regions at high level

footprints of ligand and partner binding conformational switching ideas combining with other structural data (overview)

Mini capstone deliverables (concept and report focused)

simple HDX/footprinting map layout state comparison summary table idea short narrative linking patterns to mechanism