

Database Search Engines, FDR and Decoy Strategies — Hands-on

Learn how tandem MS spectra are converted into confident peptide and protein level identifications. This module focuses on the concepts behind database search engines, scoring, target decoy based FDR estimation and filtering strategies so that you can benchmark and interpret search results for discovery and targeted proteomics studies.

Database Search Engines, FDR and Decoy Strategies

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Session 1

Fee: Rs 8800 [Apply Now](#)

PSM & Database Search Concepts

From MS/MS spectra to peptide spectrum matches (PSMs)

[theoretical vs observed spectra](#) [search space definition](#) [search candidates concept](#)

Protein sequence databases and search space control

[reference proteomes](#) [contaminants and decoys overview](#) [enzyme and missed cleavage settings](#)

Search engines at a conceptual level

scoring of candidate PSMs **search parameters and tolerances** **multi engine searches motivation**

Session 2

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Scores, Thresholds & Target Decoy FDR

Search scores, e values and posterior probabilities (conceptual)

ranking PSM candidates **score distributions**
threshold thinking

Target decoy strategies for FDR estimation

decoy construction ideas **estimating false discoveries** **global vs local FDR intuition**

Setting FDR thresholds for discovery proteomics

1 percent vs 5 percent views **effect on IDs and coverage** **choosing cutoffs for studies**

Session 3

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PSM, Peptide & Protein Level Filtering

Multi level FDR in proteomics data flows

PSM level control **peptide level aggregation** **protein group concepts**

Filtering strategies for quantitative studies

minimum peptide counts **unique vs razor peptides**
handling shared peptides

Quality diagnostics on search and FDR results

score vs FDR plots concept **decoy behaviour checks**

replicate and batch level sanity

Session 4

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Search Strategy Design & Reporting

Designing search and FDR strategies for a study

theory plus planning worksheet

Documenting parameters for reproducible analyses

search parameter tables **FDR and filtering summaries**
linking to raw and mzIdentML outputs

Reporting identifications in manuscripts and submissions

minimum reporting checklists **export formats for**
repositories **supporting tables and supplements**