

Label-Free Quantitative Proteomics and Differential Expression — Hands-on

Learn how to plan and execute label free quantitative proteomics experiments and interpret differential protein expression. This module focuses on MS1 intensity and spectral counting strategies, normalization and QC concepts, and practical differential expression workflows that link proteomics to biological questions.

Label-Free Quantitative Proteomics and Differential Expression

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Session 1

Fee: Rs 8800 [Apply Now](#)

Principles of Label-Free Quantitation

Concepts of label free quantitation in proteomics

[MS1 intensity based LFQ](#) [spectral counting](#) [precursor area integration](#)

Sensitivity, linear dynamic range and missing values

[limit of detection and quantitation](#) [ion suppression concepts](#) [missingness patterns](#)

Readouts: peptide level vs protein group level quantitation

unique and razor peptides **protein grouping ideas**
intensity roll up logic

Session 2

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Experimental Design, Replicates & QC for LFQ

Biological vs technical replicates for label free studies

group sizes and power concepts **pooling vs**
individual samples **time course and longitudinal sets**

Batch structure, randomization and run order planning

blocks and batches **randomization strategies** **bridge**
and reference samples

QC injections and stability monitoring for LFQ experiments

QC pool concept **TIC and identification trends** **drift**
detection ideas

Session 3

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Normalization & Quant Data Processing (Concepts)

From raw intensity tables to analysis ready matrices

log transforms **filtering low confidence entities**
handling missing intensities

Normalization strategies for label free data

total ion current ideas **median and quantile concepts**
internal reference scaling idea

Quality checks on normalized data

boxplots and density plots **sample clustering**

patterns **technical replicate agreement**

Session 4

Fee: Rs 18800 Apply Now

Differential Expression & Mini Capstone

Statistical testing for differential protein abundance

Theory + Practical (guided workflow)

Fold change, p values and false discovery rate concepts

volcano plot interpretation **multiple testing ideas**
effect size thinking

Mini capstone: small label free dataset from intensity table to hit list

basic QC and normalization **differential expression**
summary **short biological interpretation note**