Statistical Inference for Omics — t-tests, ANOVA & GLM — Hands-on

Build a solid, practice oriented understanding of statistical inference for omics and biomedical data. This module walks you from basic sampling distributions through t tests, ANOVA and generalized linear models, with a focus on assumptions, effect sizes, confidence intervals and reproducible reporting in R and Python.

Statistical Inference for Omics — t-tests, ANOVA, GLM

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Session Index

Session 1

Fee: Rs 8800 Apply Now

Foundations of Statistical Inference

Omics data types and distributions

continuous / counts / proportions **mean variance relationship** **log and variance stabilizing transforms**

Sampling distributions and central limit theorem

standard error and uncertainty **bootstrap intuition** **finite sample caveats**

Confidence intervals and p values

interval estimation vs testing | one sided vs two sided | practical vs statistical significance

Session 2

Fee: Rs 11800 Apply Now

Group Comparisons: t-tests & ANOVA

Two group and paired comparisons

independent and paired t tests | Welch correction | non parametric alternatives

One way and multi factor ANOVA

F statistic and variance decomposition | interaction terms | balanced vs unbalanced designs

Post hoc tests and assumptions

pairwise comparisons | normality and variance checks | robust and rank based options

Session 3

Fee: Rs 14800 Apply Now

GLM for Omics and Count Data

Linear models for omics signals

design matrices and contrasts | covariate adjustment | batch effects in models

Generalized linear models

logistic regression for binary traits | Poisson and negative binomial for counts | link functions and interpretation

Diagnostics and goodness of fit

residual plots | overdispersion checks | influence and leverage

Session 4

Fee: Rs 18800 Apply Now

Omics Inference Clinic & Reporting

Case studies with real omics datasets

gene expression and clinical cohorts

Reproducible analysis in R and Python

R stats and broom | Python statsmodels and pingouin | scripted workflows and notebooks

Deliverables: analysis report and scripts

PDF or HTML summary | annotated R and Python code | assumption and decision log