

Pathway Database Integration — KEGG, Reactome, BioCyc — Hands-on

Learn how to work productively with major pathway databases such as KEGG, Reactome and BioCyc and plug them into your omics and network analyses. This module covers data models, identifier mapping, pathway and reaction level integration, and practical workflows that link differential expression and multi omics readouts to pathway and network context.

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Session 1

Fee: Rs 8800 [Apply Now](#)

Pathway Databases & Data Models

Overview of major pathway resources

[KEGG pathways and modules](#) [Reactome reactions and events](#) [BioCyc and MetaCyc style collections](#)

Data models and file formats

[KGML, SBML and BioPAX ideas](#) [tabular exports and GMT sets](#) [reaction, gene and compound entities](#)

Toolchain for browsing and exporting pathways

KEGG, Reactome and BioCyc portals **API and bulk download options** **pathway diagram viewers**

Session 2

Fee: Rs 11800 Apply Now

ID Mapping & Harmonisation

Mapping genes, proteins and metabolites to pathway IDs

Ensembl, Entrez and UniProt IDs **KEGG Orthology and gene IDs** **ChEBI, HMDB and KEGG compound IDs**

ID conversion and harmonisation strategies

biomaRt and AnnotationDbi style tools **gprofiler and similar services** **handling one to many mappings**

Implementation toolkit for mapping pipelines

R and Python mapping scripts **reusable mapping tables** **logging unmapped entities**

Session 3

Fee: Rs 14800 Apply Now

Pathway Integration in Omics Workflows

Connecting differential analysis to pathways

from gene lists to pathway sets **over representation style analyses** **linking to KEGG and Reactome collections**

Pathway level visualisation and context

colouring pathway diagrams by log fold change **pathway network style overviews** **spotlighting key reactions and hubs**

Implementation toolkit for pathway aware analyses

R based enrichment and mapping packages **Python**
based workflows to annotate results **Cytoscape for**
pathway network views

Session 4

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Mini Capstone: Pathway Centric Network & Report

Build a pathway centric view for a real omics dataset

Theory + Practical

Integrate KEGG, Reactome or BioCyc context and visualise

mapped gene and metabolite layers **pathway level**
summary tables **network based pathway diagrams**

Deliverables: mapping scripts, pathway files & report

R or Python notebook **pathway and network export**
files **PDF/HTML pathway centric summary**