

## Special Hands-On Workshop on Genomics & AI: From Raw Data to Biological Insight

Discover how real genomics data is taken from raw reads to biological insight using Linux, Python, and AI-assisted tools in this hands-on, beginner-friendly workshop for anyone interested in Genomics, Bioinformatics, and AI.

### What You Will Learn

- **Day 1 – Foundations for genomics analysis**

- Working with Linux
- Basic Python for biological data
- Handling and visualizing datasets

- **Day 2 – Introduction to transcriptome analysis**

- Concept of transcriptome analysis and understanding gene expression
- Workflow overview
- Key steps of transcriptome analysis

- **Day 3 – Hands-on transcriptome analysis**

- Running a complete transcriptome pipeline
- Differential gene expression analysis
- Visualizing results
- Biological interpretation of outputs

- **Day 4 – AI in genomics and exome analysis (Theory)**

- Introduction to AI in genomics
- How AI helps in prioritization of results
- Pathway enrichment analysis
- Introduction to exome sequencing & variant analysis (Theory)

- **Day 5 – Exome and variant analysis (hands-on session)**

- Alignment & variant calling overview
- Working with VCF files
- Understanding variant filtering and prioritization

## **Outcomes:**

**After this workshop, you will be able to:**

- Work confidently on the Linux command line for genomics tasks
- Use Python and Google Colab for biological data analysis
- Run and understand transcriptome analysis pipelines
- Perform exome and variant analysis workflows
- Apply AI tools for results interpretation and prioritization
- Visualize and communicate genomic data effectively