CATR
Centre for Advanced Training and Research

Online Certificate Course in

Molecular Medicine & Precision Healthcare

Decode Diseases at the Molecular Level – From Genes to Precision Therapy

11-25 MAY 2026 | 6:00 PM IST | Saudi Arabia 3:30 PM | Dubai 4:30 PM | Malaysia 9:00 PM | Singapore 8:30 PM | New York 7:00 AM | London 12:30 PM

About the Course

The 15-Day Online Certificate Course in Molecular Medicine is designed to provide a strong foundation in how molecular biology drives modern disease diagnosis, treatment, and personalized healthcare. This course bridges biology, medicine, and bioinformatics, using real disease case studies, databases, and practical tools used in research and clinical settings.

Key Course Features

- 100% Online Live / Interactive Sessions
- Concept + Case-Study Based Learning
- Hands-on exposure to NCBI, ClinVar, GEO, UniProt, DrugBank
- Bioinformatics integration with molecular medicine
- Certificate of Completion
- Industry-relevant & research-oriented curriculum

Who Can Join?

- Life Science, Biotechnology, Microbiology & Biomedical students
- Medical, Pharmacy & Allied Health students
- Research scholars & lab professionals
- Professionals transitioning into molecular medicine or bioinformatics
- Anyone interested in precision & personalized medicine

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Course Fee

Indian Participants: ₹1500
Other International: $150 US

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Course Module

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Module 1: Introduction to Molecular Medicine

Topics

- Molecular medicine: concept & scope
- Traditional vs molecular medicine
- Central dogma in disease
- Types of diseases (genetic, cancer, infectious, metabolic)

Case Study

- Sickle Cell Anemia (point mutation)
- Activity
- Disease–gene search using NCBI

Module 2: Molecular Basis of Genetic Diseases

Topics

- Mutation types: missense, nonsense, frameshift
- SNPs aur disease association
- Inherited vs acquired mutations

Tools

- ClinVar

Module 3 :Molecular Oncology (Cancer Biology)

Topics

- Cancer molecular mechanism
- Oncogenes &Tumor suppressor genes
- Cell cycle dysregulation
- Hallmarks of cancer

Important Genes

- TP53, BRCA1, BRCA2, EGFR

Practical

- Cancer genes analysis using UniProt / GeneCards

Module 4: Molecular Diagnostics

Topics

- PCR, RT-PCR, qPCR
- Next Generation Sequencing (NGS) overview
- Biomarkers & companion diagnostics

Bioinformatics Angle

- RNA-Seq role in diagnosis
- Differential gene expression concept

Practical

- GEO database

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Module 5: Molecular Therapeutics

Topics

- Targeted therapy
- Small molecule drugs
- Monoclonal antibodies
- Gene therapy
- RNA-based therapies (siRNA, mRNA vaccines)

Module 6: Precision & Personalized Medicine

Topics

- Precision medicine concept
- Pharmacogenomics
- Drug response variability
- Biomarker-based treatment strategies

Tools

- DrugBank

Practical

- Drug–gene interaction analysis

Module 7: Integration of Molecular Medicine & Bioinformatics

Topics

- Drug discovery pipeline
- Molecular docking (overview)
- Network medicine
- AI/ML applications in molecular medicine

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