Computational Biology Training Program

> Develop computational and mathematical models to solve biological problems, enhancing our understanding of complex biological data in our Computational Biology Training Program.

NTHRYS provides Computational Biology Training Program at its Hyderabad facility, Telangana. Please refer below for more details including Fee strctures, Eligibility, Protocols and Modules etc.,. Please do call / message / whatsapp for more details on +91-7993084748.
Eligibility: BSc / BTech / MSc / MTech / MPhil / PhD in relevant field studying or completed students.

What do NTHRYS Provide in Computational Biology Training Program Accommodation Assistance

Please communicate with our Academic Services Department via whatsapp on +91-7993084748 for any queries.

Modules

Module 1: Fundamentals of Computational Biology
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This module introduces the basic concepts and methodologies used in computational biology, providing a solid foundation for further exploration into more complex topics.

- Introduction to Computational Biology - overview of the field and its impact on modern biology (no specific tool)

- Basic Programming for Biologists - learning programming skills necessary for biological data analysis (Python, R)
- Biological Databases - understanding the use and importance of major biological databases (NCBI, UniProt)
- Sequence Analysis - introduction to sequence alignment and searching techniques (BLAST, ClustalW)

Duration: 2 Weeks

Fee Structure: Rs 6000

Module 2: Genomic Data Analysis
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This module provides in-depth training on analyzing genomic data, crucial for understanding genetic variations and their implications in biology and medicine.

- Genome Sequencing Techniques - exploring the methodologies behind sequencing human and other genomes (Illumina platforms, PacBio)
- Genomic Annotation - understanding the process of identifying genomic regions and their functions (GENSCAN, NCBI's RefSeq)
- Comparative Genomics - analyzing and comparing the genomes of different organisms to study evolutionary relationships and functional biology (UCSC Genome Browser, Ensembl)
- Population Genetics and Genomics - applying statistical analysis to study the genetic variation and evolution of populations (PLINK, ADMIXTURE)

Duration: 2 Weeks

Fee Structure: Rs 16,000

Module 3: Proteomics and Metabolomics
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This module dives into the analytical techniques and computational tools used to study the proteome and metabolome, essential for comprehensive understanding of cellular processes.

- Introduction to Proteomics - techniques for analyzing the structure and function of proteins (mass spectrometry, 2D-PAGE)
- Protein Interaction Networks - understanding interactions and functional pathways (STRING, Cytoscape)
- Introduction to Metabolomics - methods for identifying and quantifying cellular metabolites (GC-MS, NMR spectroscopy)
- Metabolic Pathway Analysis - tools for mapping metabolites to metabolic pathways to deduce biochemical activity (KEGG, MetaCyc)

Duration: 4 Weeks

Fee Structure: Rs 45,000

Module 4: Structural Bioinformatics
+
This module focuses on the computational methods used to analyze and predict the structure of biological macromolecules and their interactions, essential for drug design and other applications.

- Molecular Modeling - techniques for predicting the three-dimensional structures of proteins and other macromolecules (Pymol, Chimera)
- Protein Structure Prediction - methods for inferring protein structures when no structure is known (SWISS-MODEL, I-TASSER)
- Protein-Ligand Interaction - analyzing the interactions between proteins and small molecules, crucial for drug discovery (AutoDock, MOE)
- Molecular Dynamics Simulations - simulating the physical movements of atoms and molecules (GROMACS, AMBER)

Duration: 4 Weeks

Fee Structure: Rs 65,000

Module 5: Bioinformatics in Personalized Medicine
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This module delves into the application of computational biology techniques in personalized medicine, demonstrating how genetic data can guide individualized treatment strategies.

- Genomic Medicine - integrating genomic data into clinical practice to enhance diagnostic and therapeutic precision (genome analysis platforms, clinical genomics databases)
- Pharmacogenomics - studying how genes affect a person’s response to drugs to optimize drug therapy and reduce adverse effects (software for drug-gene interaction analysis)
- Cancer Genomics - leveraging genomic data to understand tumor biology and influence treatment decisions (cancer genome analysis tools, OncoDB)
- Biomarker Discovery - identifying and utilizing biomarkers for disease diagnosis, prognosis, and treatment monitoring (biomarker analysis software, statistical tools for biomarker validation)

Duration: 8 Weeks

Fee Structure: Rs 1,30,000

Module 6: Emerging Technologies and Future Directions
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This module provides insights into the cutting-edge technologies and future trends in computational biology, highlighting how these advancements will shape research and clinical practice.

- Single-Cell Genomics - analyzing genetic information at the level of individual cells to uncover cellular diversity and molecular processes (single-cell sequencing platforms, analytical tools)
- CRISPR and Genome Editing - exploring the implications of genome editing technologies in research and therapy (CRISPR design tools, off-target prediction software)
- Artificial Intelligence in Bioinformatics - utilizing AI to enhance data analysis, interpretation, and predictive capabilities in biological research (deep learning frameworks, AI-driven predictive models)
- Biological Data Visualization - advancing techniques for visualizing complex biological data sets, enhancing understanding and communication of results (advanced visualization tools, interactive platforms)

Duration: 8 Weeks

Fee Structure: 1,70,000

Please choose a suitable time slot and inform our team via WhatsApp on +91-8977624748 (located at the top right corner) to receive the payment link for fee payment and slot confirmation.