

## Computational Biology Internship

# NTHRYS Computational Biology Internship Focussed Research Areas

1. **Algorithm Development:** Create novel computational algorithms for analyzing biological data, such as gene expression patterns, protein interactions, or genomic sequences, to improve accuracy and efficiency.
2. **Predictive Modeling:** Develop predictive models using machine learning and statistical techniques to forecast biological phenomena like protein folding, drug-target interactions, or disease progression.
3. **Network Analysis:** Investigate complex biological networks (e.g., metabolic, regulatory, or protein-protein interaction networks) to identify key nodes, pathways, and their implications in cellular processes.
4. **Genome Annotation:** Improve methods for annotating and interpreting genomic data, aiming to understand gene function, regulatory elements, and variations across different species.
5. **Structural Biology Simulations:** Utilize computational methods like molecular dynamics simulations to study the structure, dynamics, and interactions of biomolecules (proteins, RNA, DNA) for drug discovery or functional insights.
6. **Evolutionary Analysis:** Explore evolutionary patterns and mechanisms using computational approaches to understand the origins of genetic variation, speciation events, and molecular adaptation.
7. **Systems Biology Integration:** Integrate multi-omics data (genomics, transcriptomics, proteomics, metabolomics) to create comprehensive models describing the interplay of biological components in living systems.
8. **Drug Design and Discovery:** Develop computational tools to facilitate drug design, virtual screening of compounds, and prediction of drug-target interactions, expediting the drug discovery process.
9. **Personalized Medicine:** Use computational methods to analyze individual genomic data, aiming to tailor medical treatments, predict disease risk, and optimize therapies based on genetic profiles.
10. **Biological Data Visualization:** Create intuitive and informative visualization tools to aid researchers in interpreting complex biological data, facilitating data-driven insights and hypothesis generation.
11. **Single-cell Analysis:** Develop computational methods to analyze and interpret single-cell sequencing data, unraveling cellular heterogeneity and dynamics in tissues and organisms.

12. **Cancer Genomics:** Investigate computational approaches to characterize tumor heterogeneity, identify driver mutations, and predict treatment responses in cancer patients based on genomic data.
13. **Metagenomics:** Develop tools and algorithms to analyze metagenomic data from environmental samples or microbiomes, exploring microbial diversity, function, and their impact on ecosystems or human health.
14. **RNA Structure Prediction:** Improve computational methods for predicting RNA secondary and tertiary structures, understanding their functional implications in gene regulation and disease.
15. **Phylogenetics and Phylogenomics:** Develop advanced algorithms to reconstruct evolutionary relationships among species, leveraging genomic data to infer phylogenetic trees and evolutionary histories.
16. **Spatial Transcriptomics:** Develop computational techniques to analyze spatially resolved transcriptomic data, elucidating cellular interactions and organization within tissues.
17. **Epigenomics Analysis:** Create tools for analyzing epigenetic modifications (DNA methylation, histone modifications) to understand their role in gene regulation, development, and diseases.
18. **Immunoinformatics:** Use computational methods to analyze immune system data, such as antigen recognition, immune cell receptors, and immune response modeling, aiding in vaccine design and immunotherapy.
19. **Multi-scale Modeling:** Integrate computational models across different scales of biological organization (molecular, cellular, tissue, organismal) to gain a holistic understanding of biological systems.
20. **Biological Image Analysis:** Develop algorithms for processing and analyzing biological images (microscopy, medical imaging) to extract quantitative information about cellular structures and functions.
21. **Artificial Intelligence in Biology:** Explore the applications of AI, including deep learning and neural networks, in analyzing biological data, predicting biological activities, and optimizing experimental design.
22. **Evolutionary Developmental Biology (Evo-Devo):** Employ computational approaches to study the genetic and developmental basis of evolutionary changes in organismal structures and developmental processes.
23. **Disease Biomarker Discovery:** Use computational methods to identify and validate biomarkers associated with various diseases, aiding in early diagnosis and prognosis prediction.
24. **Comparative Genomics:** Compare genomic data across species to identify conserved elements, understand evolutionary constraints, and uncover functional elements in genomes.
25. **Population Genetics:** Develop computational models to study genetic variation within and between populations, exploring factors like migration, selection, and demographic history.
26. **Biomedical Text Mining:** Create algorithms to extract and analyze information from biomedical literature, aiding in knowledge discovery and facilitating data-driven research.
27. **Environmental Genomics:** Apply computational tools to analyze genomic data from environmental samples, understanding microbial ecology, biodiversity, and ecological interactions.
28. **Neuroinformatics:** Develop computational tools to analyze complex neural data

(neuroimaging, neuronal activity), aiming to understand brain function, disorders, and cognitive processes.

29. Bioinformatics Education and Outreach: Develop educational resources and tools to enhance bioinformatics literacy among researchers, students, and the broader community.

## Fee Structure

Note 1: Fee mentioned below is per candidate.

Note 2: Fee of any sort is NON REFUNDABLE once paid. Please cross confirm all the details before proceeding to fee payment

2 Days Total Fee: Rs 1800/-
Reg Fee Rs 540/-
5 Days Total Fee: Rs 4174/-
Reg Fee Rs 1252/-
10 Days Total Fee: Rs 6400/-
Reg Fee Rs 1920/-
15 Days Total Fee: Rs 10105/-
Reg Fee Rs 3032/-
20 Days Total Fee: Rs 14933/-
Reg Fee Rs 4480/-
30 Days Total Fee: Rs 23718/-
Reg Fee Rs 5500/-
45 Days Total Fee: Rs 36141/-
Reg Fee Rs 5500/-
2 Months Total Fee: Rs 44800/-
Reg Fee Rs 5500/-
3 Months Total Fee: Rs 68267/-

<b>Reg Fee Rs 5500/-</b>
4 Months Total Fee: Rs 90667/-
<b>Reg Fee Rs 5500/-</b>
5 Months Total Fee: Rs 114133/-
<b>Reg Fee Rs 5500/-</b>
6 Months Total Fee: Rs 136533/-
<b>Reg Fee Rs 5500/-</b>
7 Months Total Fee: Rs 160000/-
<b>Reg Fee Rs 5500/-</b>
8 Months Total Fee: Rs 182400/-
<b>Reg Fee Rs 5500/-</b>
9 Months Total Fee: Rs 204800/-
<b>Reg Fee Rs 5500/-</b>
10 Months Total Fee: Rs 228267/-
<b>Reg Fee Rs 5500/-</b>
11 Months Total Fee: Rs 250667/-
<b>Reg Fee Rs 5500/-</b>
1 Year Total Fee: Rs 274133/-
<b>Reg Fee Rs 5500/-</b>

**Please contact +91-9014935156 for fee payments info or EMI options or Payment via Credit Card or Payment using PDC (Post Dated Cheque).**