

biotecnika
Your Bio Resource

Bioinformatics Summer Internship 2024

With Hands-On-Training + Project / Dissertation

Exclusively Crafted For B.Sc., M.Sc., B.Tech M.Tech. B.Pharm, M.Pharm, & Ph.D. Students

Duration: 30 days, 3 Months & 6 Months Project / Dissertation

STARTS 4th June 2024

stores.biotecnika.org



Get ready to unlock the mysteries of life as the Bioinformatics Summer Internship 2024, BGTI 4.0, is finally here! With the aim to foster the next generation of bioinformatics leaders, the internship program offers a unique opportunity for students and professionals alike to dive into the exciting world of computational biology. With hands-on training and guidance from seasoned professionals, interns will gain practical experience in cutting-edge techniques and tools used in bioinformatics. So, if you're ready to take your first steps toward a career in bioinformatics, join us for a summer of discovery, innovation, and growth!

30-Days, 3 Months & 6 Months Hands-on Summer Internship

START DATE: 4th JUNE 2024

Session No.	Unit No. and Topic
	UNIT-1: Introduction: Why Learn Bioinformatics?
DAY-1	Ice-breaking Session on Bioinformatics Global Tools and Techniques
DAY-2	Scope & Opportunities in Bioinformatics: India & Abroad
DAY-3	Understanding Key Terminology in Bioinformatics Databases
	UNIT-2: Dicephering molecules at the sub-molecular level
Day 4	Carbohydrates and Proteins **Demo on tools: Cheminformatics**
Day 5	Lipids and Nucleic acids **Demo on tools: ChemDraw & ChemSketch**

Program Module

Session No.	Unit No. and Topics
	UNIT-3: Bioanalytics: Understanding the patterns of life
Day 6	Primary Sequences – DNA, RNA, and Proteins **Demo on tools: NCBI, EMBL, DDBJ, and SBI**
Day 7	Secondary Structures – DNA, RNA, and Proteins **Demo on tools: GORV, Swiss model, I-TASSER, Phyre2**
Day 8	Tertiary Structures – Stability, folding, and misfolding **Demo on tools: Protein Data Bank (PDB), EMBL and SBI**
Day 9	Biochemical and Metabolic pathway analysis **Demo on tools: KEGG database and Cytoscape**
	UNIT-4: Biocomputing- Computer-Aided Drug Design (CADD)
Day 10	Introduction, Drug discovery pipeline: Target identification and validation, Lead identification and optimization, Virtual screening **Demo: IMPPAT and Dr. Duke's Phytochemical and Ethnobotanical databases for Phytochemistry Research.**

Program Module

Day 11	ADMET Studies for the lead optimization. **Demo on tools:** SWISS-ADME, Analysis,and Interpretation Boiled-Egg Model
Day 12	Introduction to protein and modelling concepts, types, homology modelling, and the ab-initio method. **Demo on tools: PDB tools, Swiss ExPaSy**
DAY 13	Constructing a Phylogenetic Tree- **Demo on tools: ClustalW, Clustal Omega**
DAY 14	QSAR Studies and Interpretation of Docking **Demo on Molecular docking software:** Patchdock, Autodock, ClusPro web server
DAY 15	Introduction to Molecular Dynamics and Simulation (MDS).

Unit-5: Biomimetics: Driving Deeper

DAY 16	Pre-clinical (Bacterial, Fly, Plants, and Murine models), Human Clinical Trials for drug discovery, Functional genomics, and Comparative genomics. **Demo on the tool: Differential expression analysis on bacterial genome.**

Program Module

Day 17	Protein-protein interaction network, STRING, Network terminology, Pathway enrichment analysis **Demo on the tool: STRING and Cytoscape.**
Day 18	Human Genome project, Bacterial Genomics, Human Microbiome, and Epigenetics **Demo on database: Ensembl Bacteria, MicrobiomeDB**
DAY 19	Sanger sequencing, Next Generation Sequencing: DNA Sequencing, RNA Sequencing. miRNA Analysis. **Demo on the tool: Databases: dbSNP, Clinvar, Genome browsers: UCSC and Ensembl**

Unit-6: Pening Down: Publish or Perish

DAY 20	Publication types, formats, and journals **Demo on the tool: Elsevier, Springer, Wiley, MDPI, and Bentham Sciences**
DAY 21	Research made easy with Artificial Intelligence (AI & ML) **Demo on the tool: Applications of ChatGPT in BioResearch**
DAY 22	Selection of the journal and indexing **Demo on the tool: Journal finder**

Program Module

Day 23	Submission, Revision, and re-submission process **Demo on tool: Editorial Manager**

Unit-7: Proposal Writing and Grant Submission

DAY 24	Structure and ingredients of proposal writing
DAY 25	Networking and funding from (govt./ private/ industrial partners)
DAY 26	Portals for grant submission and prerequisites
DAY 27	Generating primary data for proposal and funding

Unit-8: Launch Yourself

DAY 28	Generating ideas, Start-ups, and Bioenterpreunship
DAY 29	Live troubleshooting session
DAY 30	Open Discussion

About the Instructor



Ms. Nilofer K Shaikh , PhD

With a strong background in big data analysis using computational approaches in cancer omics data, Ms. Nilofer K Shaikh brings a wealth of experience from MIT ADT University. Her expertise spans cancer research, drug design, molecular dynamics simulation, data mining, and various omics technologies. Proficient in Python, R, and computational methodologies, she has a deep understanding of genomics, metabolomics, proteomics, transcriptomics, pharmacogenomics, and AI for cancer treatment. Her skillset also includes machine learning, MySQL database management, and natural language processing (NLP

About the Instructor



Dr. Prakrity Singh, PhD

Dr. Prakrity Singh, a dedicated computational biologist with a Ph.D., is passionate about using advanced computational techniques to solve complex biological problems as a Ph.D. Scholar (SRF) at CSIR-Indian Institute of Toxicology Research, Her research focuses on understanding atomic structures related to persistent organic pollutants and their impact on biological systems. Dr. Singh has contributed significantly to drug discovery and toxicity projects, with her work published in peer-reviewed journals. Her commitment to advancing scientific understanding, with applications in environmental protection and human health, underscores her trailblazing role in computational biology. Dr. Singh's expertise promises to shape the future of computational biology and its role in toxicology

About the Instructor



Mr. Prodyot Banerjee

Prodyot Banerjee is a seasoned professional in Computer-Aided Drug Designing, Bioinformatics Analysis, and Genomics, boasting rich experience from institutions like CSIR-IGIB, CSIR-CLRI, IIT Madras, and Delhi Technological University.

With an M.Tech in Bioinformatics from Delhi Technological University, Prodyot has excelled in research and development roles, presenting his work at prestigious venues like IIT Kharagpur. His research is published in esteemed journals such as IEEE and Frontiers in Pharmacology, with more underway. Prodyot's GATE 2019 qualification from IIT Madras underscores his dedication to both academic excellence and professional growth. With a proven track record and relentless pursuit of knowledge, he is a valuable asset in bioinformatics, genomics, and computer-aided drug design endeavors.

Top Biopharma Companies Hiring in Bioinformatics Abroad

Illumina:

A leading developer of next-generation sequencing (NGS) technology. They hire bioinformaticians for roles in data analysis, software development, and product managemen

Google Health

A division of Google focused on developing healthcare technologies. They hire bioinformaticians for roles in drug discovery, genomics research, and machine learning.

Roche

A Swiss multinational pharmaceutical company. They hire bioinformaticians for roles in drug discovery, clinical research, and personalized medicine.

Johnson & Johnson

An American multinational pharmaceutical and medical devices company. They hire bioinformaticians for roles in drug discovery, clinical research, and data science

Pfizer

An American multinational pharmaceutical and biotechnology company. They hire bioinformaticians for roles in drug discovery, clinical research, and vaccines development.

Gilead Sciences

An American biopharmaceutical company that develops antiviral medications. They hire bioinformaticians for roles in drug discovery, clinical research, and regulatory affairs

Vertex Pharmaceuticals

An American biopharmaceutical company that develops treatments for cystic fibrosis and other rare diseases. They hire bioinformaticians for roles in drug discovery, clinical research, and personalized medicine.

Amgen

An American multinational biopharmaceutical company that develops and markets innovative human therapeutics. They hire bioinformaticians for roles in drug discovery, clinical research, and manufacturing.

Novartis

An American multinational pharmaceutical and biotechnology company. They hire bioinformaticians for roles in drug discovery, clinical research, and vaccines development.

Celgene

An American biopharmaceutical company that develops and markets treatments for cancer and inflammatory diseases. They hire bioinformaticians for roles in drug discovery, clinical research, and personalized medicine.





Bioinformatics is a rapidly growing field that combines biology, computer science, mathematics, and statistics to analyze and interpret biological data, particularly from genomics, proteomics, and other high-throughput technologies. As technology advances and biological data becomes increasingly abundant, the demand for bioinformatics professionals continues to rise. Here are some key points regarding the career scope in bioinformatics:

CAREER SCOPE in BIOINFORMATICS

Toll Free - 1800-1200-1818

www.Biotecnika.org

Interdisciplinary Nature



Bioinformatics is inherently interdisciplinary, requiring professionals to have a solid understanding of both biological sciences and computational techniques. This opens up diverse career opportunities in research institutions, pharmaceutical companies, biotechnology firms, healthcare organizations, and academia.

Research Opportunities

Bioinformatics professionals are heavily involved in research aimed at understanding biological processes, such as genetics, evolution, disease mechanisms, and drug discovery. They work on projects ranging from genome sequencing and annotation to molecular modeling and systems biology



Pharmaceutical and Biotechnology Industries



With the advancement of personalized medicine and the need for targeted drug development, pharmaceutical and biotechnology companies increasingly rely on bioinformatics to analyze large-scale biological data, identify drug targets, predict drug interactions, and optimize therapeutic outcomes.

Healthcare and Clinical Applications

Bioinformatics professionals are heavily involved in research aimed at understanding biological processes, such as genetics, evolution, disease mechanisms, and drug discovery. They work on projects ranging from genome sequencing and annotation to molecular modeling and systems biology



Academia and Education



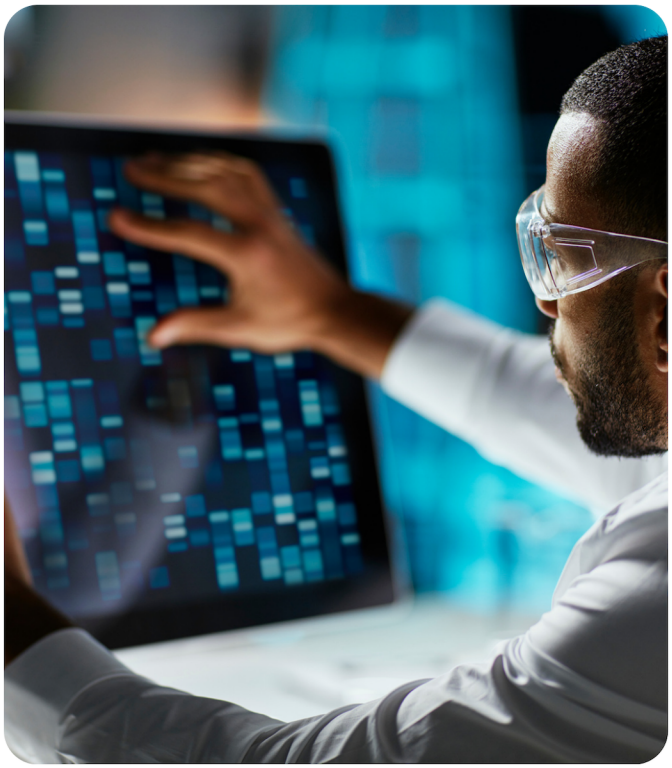
Many bioinformatics professionals pursue careers in academia, where they teach courses, supervise research projects, and contribute to the advancement of knowledge in the field. They may also work in bioinformatics training programs and workshops to educate future generations of scientists

Data Science and Big Data Analytic

The skills acquired in bioinformatics, such as data mining, machine learning, and statistical analysis, are highly transferable to other fields, including data science and big data analytics. Bioinformatics professionals often find opportunities in industries outside of biology, such as finance, marketing, and cybersecurity.



Emerging Technologies

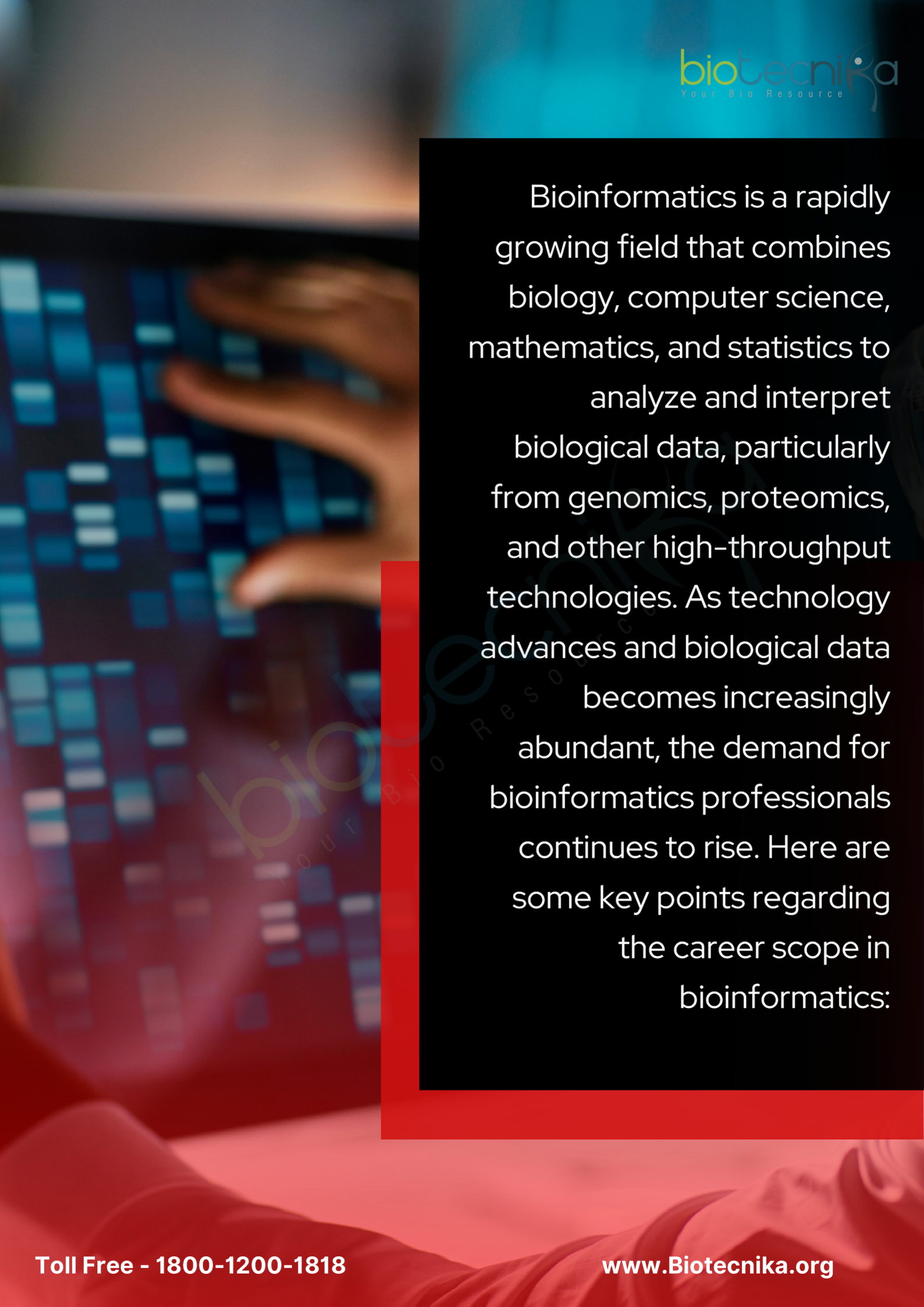


Rapid advancements in technologies like next-generation sequencing, single-cell analysis, and CRISPR-based genome editing continue to drive innovation in bioinformatics. Professionals in this field need to stay updated with the latest tools and methodologies to remain competitive and address new challenges in biological research.

Global Impact

Bioinformatics has a global impact on various aspects of human health, agriculture, environmental conservation, and biotechnology. Professionals in this field have the opportunity to contribute to groundbreaking discoveries and solutions to global challenges





Bioinformatics is a rapidly growing field that combines biology, computer science, mathematics, and statistics to analyze and interpret biological data, particularly from genomics, proteomics, and other high-throughput technologies. As technology advances and biological data becomes increasingly abundant, the demand for bioinformatics professionals continues to rise. Here are some key points regarding the career scope in bioinformatics:

How Will This Internship Help You? And What will you learn?

biotecnika
Your Bio Resource

- Interns will learn how to use bioinformatics tools and software to interpret complex biological data, and develop the skills necessary to design and implement their own computational pipelines.
- Dive into the refreshing side of science this summer with 30 days, 3 months & 6 months of Bioinformatics training! Get a complete 360-degree approach to Bioinformatics with LIVE practicals, assignments & projects
- By the end of the program, interns will have gained hands-on experience with cutting-edge techniques and will be well-prepared to pursue a career in bioinformatics or related fields.
- Troubleshooting sessions with seasoned professionals will ensure you have all the support you need to explore this exciting field.

Whether you're a beginner or an experienced student, this internship program will give you a chance to sharpen your skills, learn from the best in the business, and gain hands-on experience with the latest bioinformatics tools and software. So, join us for a summer of discovery, growth, and fun!

Toll Free - 1800-1200-1818

www.Biotecnika.org


biotecnika
Your Bio Resource