Welcome to the Coding For Biologist Hands-on Training Program

Embark on a transformative journey with our specialized training program, designed specifically for biologists who wish to master Python, R, BioPython, and CADD for biological data analysis. Starting October 7th, 2024, this comprehensive course offers extensive hands-on experience with 3, 6, and 12-month project options where you'll learn to develop biotech software through practical coding applications.

Dive into the world of bioinformatics, a dynamic field that represents both the present and the future of biotechnology. Coding is your gateway to unlocking the vast potential it holds. Whether you're looking to enhance your skills or pivot your career path, our program provides the tools and knowledge necessary to navigate and excel in this innovative landscape.

Join us as we explore the intersections of biology and technology, creating solutions that advance scientific discovery and research.

Toll Free - 1800-1200-1818

Training Modules

Week 1: Introduction to Biological Data Analysis

DAY-1 **Getting Started with Python and R**
»
- Python vs. R for Biological Data Analysis
- Installing Python, R, and Required Libraries

DAY-2 **Data Import and Manipulation**
»
- Working with Biological Data Formats
- Basic Data Manipulation with Python and R

DAY-3 **Data Visualization**
»
- Introduction to Data Visualization
- Creating Basic Plots with Matplotlib (Python) and ggplot2 (R)

DAY-4 **: Exploratory Data Analysis (EDA)**
»
- Understanding Your Biological Data
- EDA Techniques in Python and R

DAY-5 **Introduction to Bio Python**
»
- Python vs. R for Biological Data Analysis
- Installing Python, R, and Required Libraries

Training Modules

Week 2: Molecular Data Analysis

Day -6   **Sequence Alignment**
»
- Introduction to Sequence Alignment
- Pairwise Sequence Alignment with Bio Python

DAY-7   **Multiple Sequence Alignment**
»
- Multiple Sequence Alignment with Bio Python
- Sequence Alignment Tools and Techniques

DAY-8   **Phylogenetic Analysis**
»
- Building Phylogenetic Trees
- Tree Visualization and Interpretation

DAY-9   **: Sequence Feature Analysis**
»
- Identifying and Annotating Sequence Features
- Sequence Motif Search with Bio Python

DAY-10   **Protein Structure Analysis**
»
- Introduction to Protein Structure Analysis
- Using Bio Python for Protein Structure Data

Training Modules

Week 3: Clinical Data Analysis

Day -11 **Clinical Data Preprocessing**
»
- Cleaning and Organizing Clinical Data
- Handling Missing Data

DAY-12 **Survival Analysis**
»
- Introduction to Survival Analysis
- Kaplan-Meier Estimator and Cox Proportional Hazards Model in R

DAY-13 **File Parsing and Data Retrieval**
»
- Reading and Writing FASTA Files
- Parsing GenBank Files

DAY-14 **CADD data analysis using Python and BioPython**
»
- Working with molecular structures and visualization for drug designing
- Analyzing drug bioactivity data to screen potential drug candidates

DAY-15 **Project and Presentation**
»
- Apply your knowledge in a real research project.
- Showcase your skills and insights gained during the training.
- Present your findings and contributions to the field.

Project Work Opportunities

In addition to the 15-day training program, participants have the option to engage in **real-time projects for 3 or 6 months.** Below are the available project topics along with the respective project guides

1. Genomic Data Visualization Tool

Develop an integrated bioinformatics tool for visualizing and exploring genomic data, including gene expression profiles with its mutations.
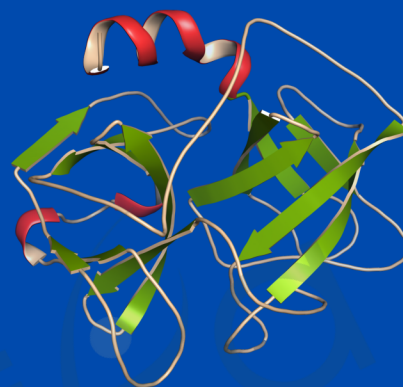
Duration: 6 months
Project Guide: Dr. Nilofer Shaikh

Project Work Opportunities

2. 3D Protein Structure and Drug Visualizer and Analysis Tool

Develop an integrated bioinformatics tool for visualizing and exploring genomic data, including gene expression profiles with its mutations.

Duration: 12 months

Project Guide :Prodyot Banerjee

3.Microbiome Diversity and Functional Analysis Tool

Build a comprehensive tool and web interface for analyzing microbiome datasets, providing rich visualizations of microbial diversity, composition, and functional capabilities

Duration: 6 months

Project Guide :Dr. Elamathi Natarajan

Project Work Opportunities

4. CRISPR-Cas9 Target Site Analysis

Develop an integrated bioinformatics tool for visualizing and exploring genomic data, including gene expression profiles with its mutations.
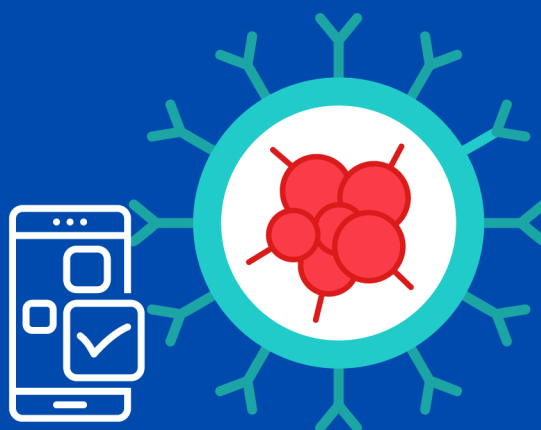
Duration: 6 months

Project Guide :Dr. Elamathi Natarajan

5.Cancer Mutation Signature Analysis App

Develop a user-friendly software tool to analyze mutational signatures in cancer genomics, uncovering patterns that can guide therapeutic strategies.

Duration: 6 months

Project Guide : Dr. Nilofer Shaikh

Project Work Opportunities

6. Gene Expression Analysis Using Python

Project Guide :Dr. Nilofer Shaikh

7. Identification of Drug-like Properties, and Molecular Interaction Analysis of Phytochemicals Against Cancer Targets

Project Guide :Dr. Elamathi Natarajan

8. To Identify Novel Mutations in Neurological Disorders Using AI/ML Based Databases

Project Guide : Prodyot Banerjee

9. Model Development for the Screening of Log P Value Using Machine Learning Based Algorithms

Project Guide :Dr. Elamathi Natarajan

10.Virtual Screening of Novel Druggable Compounds Using AI/ML Based Tools

Project Guide : Prodyot Banerjee

Project Work Opportunities

11. Principal Component Analysis-Based Unsupervised Feature Extraction Applied to In-Silico Drug Discovery

Project Guide :Dr. Elamathi Natarajan

12. Comparative Analysis of Data Mining Tools and Classification Techniques Using WEKA in Medical Bioinformatics

Project Guide :Dr. Elamathi Natarajan

13. Pharmacokinetic/Pharmacodynamic Studies of the Druggable Compounds and Identifying the Pockets and Cavities of Protein

Project Guide :Prodyot Banerjee

14.Identification and Screening of Antiviral Compounds in Terms of Their ADME/T Properties

Project Guide :Dr. Elamathi Natarajan

15. To Carry Out Multiple Ligand Docking Studies Using the Screened Druggable Compounds and to Present the Docked Complex as per Publication Standards Using Visualization Tools

Project Guide :Prodyot Banerjee

16. Gene Function Prediction from DNA Coding Sequence Using AI/ML Classifiers and Databases

Project Guide :Prodyot Banerjee

17. Feature Selection and Clustering of Gene Expression Profiles Using Biological Knowledge

Project Guide :Dr. Elamathi Natarajan

18. To Design Mutant Protein Structure Model Using AlphaFold and to Identify the Protein's Stability

Project Guide : Prodyot Banerjee

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

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Your Bio Resource

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.

About the Instructor

Dr. Elamathi Natrajan

Elamathi Natarajan is a dedicated bioinformatician with a robust background in computational biology, data analysis, and genomics. Holding a Doctorate in Bioinformatics from Dr. A.P.J Abdul Kalam Technical University and an MBA in Information Systems Management, she has made significant contributions to the field through both research and teaching.

She has served as an Assistant Professor and Head of Department (HOD) In-Charge at Kalinga University, Raipur, where she excelled in lecturing, research, and departmental

management. At Biotecnika Info Labs Pvt Ltd, Bangalore, she played a key role in academic support, enhancing student success through coaching and program development.

Elamathi's expertise includes developing bioinformatics pipelines, conducting quality assessments, and applying machine learning algorithms to genomics data. Recognized for her work, including a Senior Research Fellowship from the Indian Council of Medical Research (ICMR), she continues to drive innovation in bioinformatics and is seeking a new challenge to further advance scientific discoveries.

Top 10 Companies Abroad & in India

That often seek candidates proficient in coding for biology-related role

Illumina

A leader in genomics and DNA sequencing technologies, Illumina often hires bioinformatics specialists and software developers with strong coding skills to manage large genomic datasets

illumina®

Thermo Fisher Scientific

ThermoFisher SCIENTIFIC

This company is known for its contributions to life sciences and technology, including a wide range of biotechnology products. They frequently look for professionals skilled in bioinformatics and biological data analysis.

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Genentech

As a pioneer in biotechnology, Genentech hires professionals with coding skills for roles in drug discovery, genomics, and personalized medicine research.

Genentech
A Member of the Roche Group

Agilent

Agilent Technologies

Specializing in laboratories and research, Agilent seeks individuals skilled in coding for developing analytical instruments and software used in genomics and molecular biology.

Qiagen

A provider of sample and assay technologies, Qiagen employs bioinformaticians and software engineers to develop solutions for molecular testing.

QIAGEN

CRISPR THERAPEUTICS

CRISPR Therapeutics

This biotech company focused on gene editing technology often requires experts in coding for developing tools and algorithms in genetics research.

10x Genomics

Known for its advanced genomic sequencing technology, 10x Genomics hires software developers and bioinformaticians to enhance their platforms for single-cell analysis

Pfizer

A global pharmaceutical giant, Pfizer employs coding professionals for drug development and to handle complex biological data sets in various research areas.

Regeneron Pharmaceuticals

Known for its research in genetics and biopharmaceuticals, Regeneron seeks individuals skilled in programming and bioinformatics.

Broad Institute

A collaborative research institution focusing on biomedical and genomic research, the Broad Institute hires professionals with a background in bioinformatics, programming, and data analysis

These companies often require candidates to have expertise in specific programming languages like **Python, R, and MATLAB,** along with a good understanding of genetics, genomics, and related fields

Top 10 companies in India that frequently hire candidates skilled in coding for biology-related roles

Biocon

ndia's premier biopharmaceutical company, Biocon often looks for professionals with expertise in bioinformatics and biological data analysis to enhance their drug development processes

Biocon

TATA MD

Tata Medical and Diagnostics

A part of the Tata conglomerate, this company focuses on healthcare and biotechnology solutions, including genetic testing and molecular diagnostics, employing individuals skilled in bioinformatics and coding

Mapmygenome

Specializing in personalized health solutions through genetic tests, Mapmygenome requires professionals with strong coding skills for genomics data analysis.

Strand Life Sciences

A genomic profiling company that employs bioinformaticians and software developers to handle complex genomic data and develop diagnostic tests

Molecular Connections

Known for its research services in life sciences, this company hires bioinformaticians and computational biologists proficient in coding for database and algorithm development

MedGenome

Operating in genomics-based diagnostics and research, MedGenome looks for professionals with expertise in next-generation sequencing data analysis and software development.

Premas Biotech

Involved in novel biotherapeutic discovery and development, Premas Biotech hires candidates skilled in computational biology and software development for biotechnological applications

Bugworks Research

– A biotech startup that designs novel therapeutics, Bugworks Research requires computational biologists and bioinformatics experts to support their drug discovery efforts

Genotypic Technology

A genomics company offering DNA sequencing and analysis services, Genotypic Technology employs bioinformaticians to develop and optimize data analysis tools and pipelines

Persistent Systems

Although primarily a technology company, Persistent Systems engages in life sciences software development, requiring coding expertise for developing bioinformatics applications

These companies span the biotech, pharmaceutical, and genomics sectors and commonly seek **professionals who can combine biological knowledge with programming** skills to drive innovations and enhance research and development.
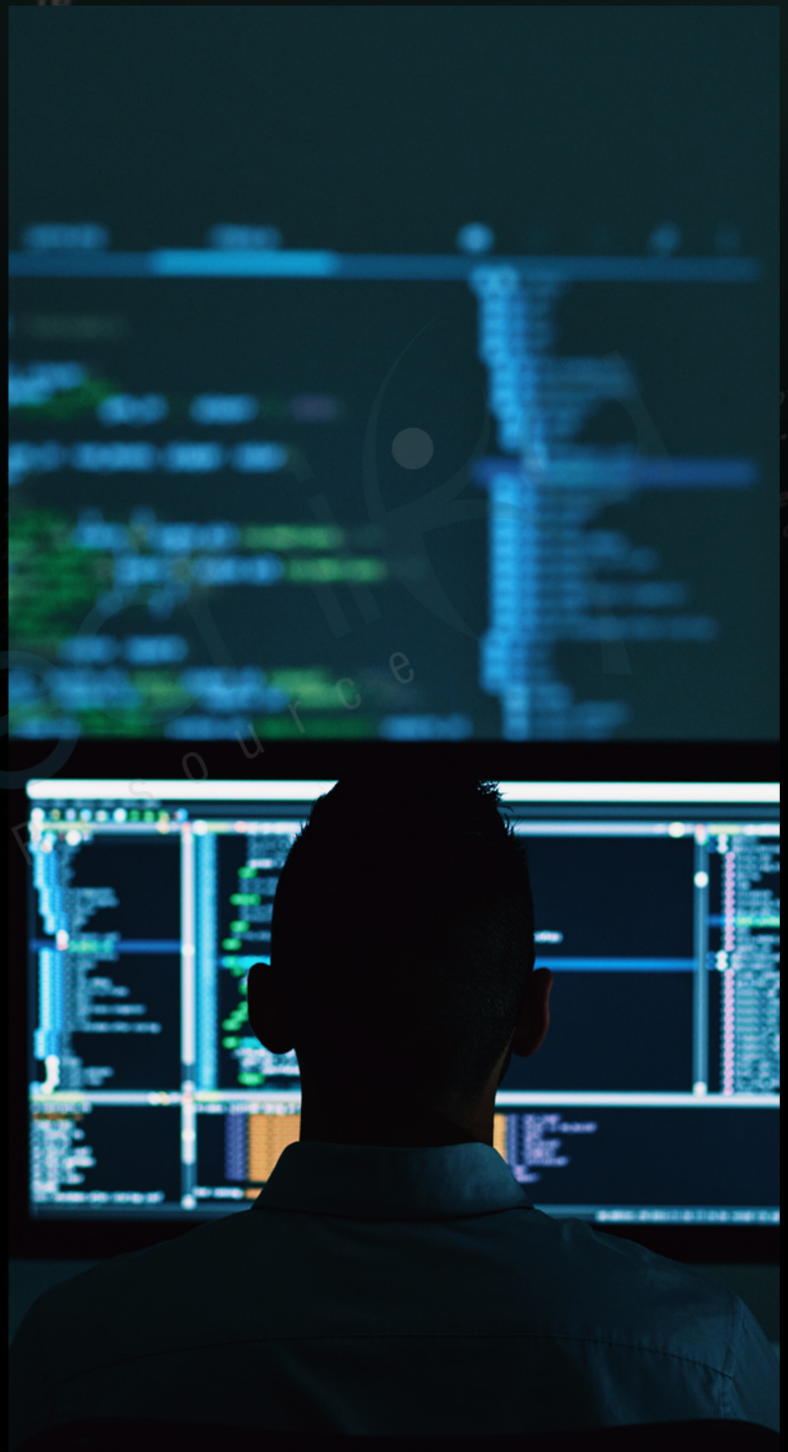
Why Attend This Training

This training offers a unique opportunity for life science candidates to **gain hands-on experience in coding and biological data analysis.** By participating in this program, you will

- **Build In-Demand Skills:** Learn the coding languages and tools that are in high demand in the life sciences and bioinformatics fields.

- **Networking:** Connect with experts and peers in the field, building valuable connections for your future endeavors.

- **Advance Your Career:** Acquire skills that will make you more competitive in the job market and open up a wide range of career opportunities in academia, research, and industry.

- **Apply Knowledge:** The program culminates in a project and presentation, allowing you to apply your newfound skills to real-life biological data analysis challenges

- **Work on Real Time Projects & Publish papers**