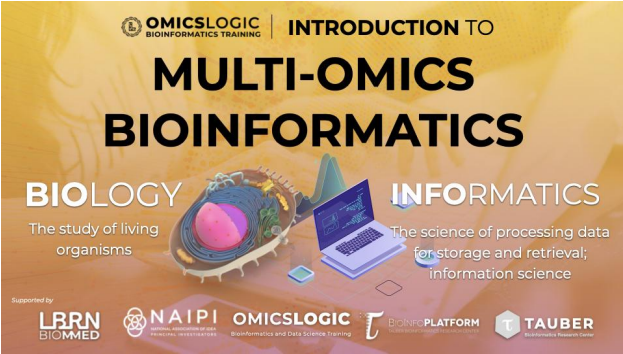
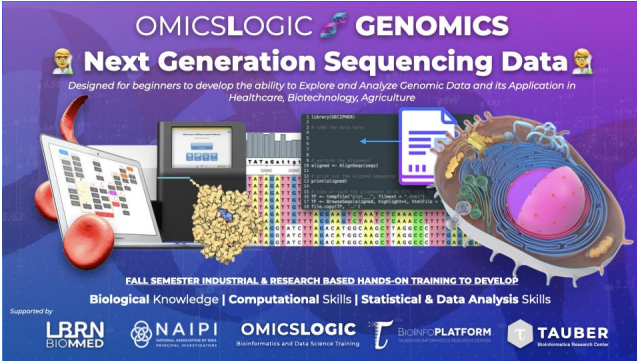
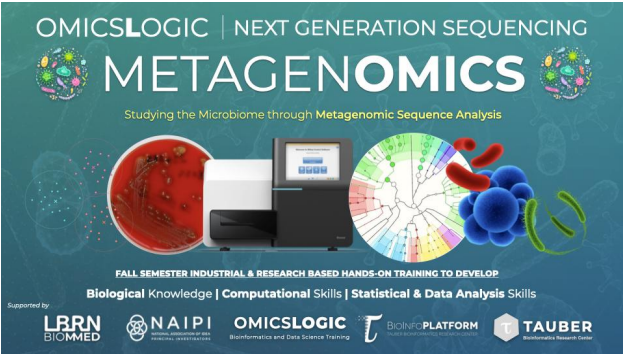
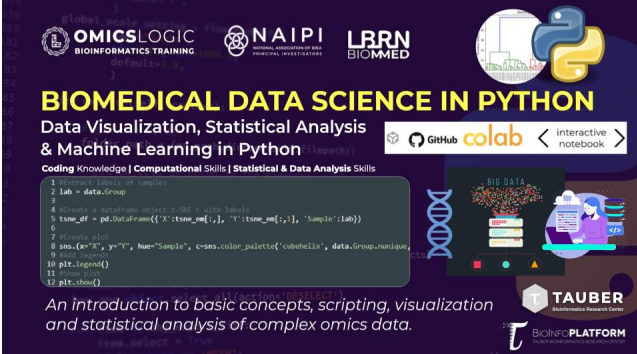


# Immersive Big Data Bioinformatics & NGS Experience Applying Biomedical Data Science Training for LSU & LBRN Biommed Students & Faculty & Staff!

**Live Orientation on Sept 28 & 29, at 9 AM CST**

**Learn More About the Upcoming LSU BIOMMED FALL PROGRAMS**

<p><b>INTRODUCTION TO MULTI-OMICS BIOINFORMATICS</b></p>  <p>The poster features a central image of a cell with a laptop and a smartphone. Text includes 'OMICSLOGIC   INTRODUCTION TO MULTI-OMICS BIOINFORMATICS', 'BIOLOGY: The study of living organisms', and 'INFORMATICS: The science of processing data for storage and retrieval; information science'. Logos for LBRN BIOMMED, NAIPI, OMICSLOGIC, BIOINFP-PLATFORM, and TAUBER are at the bottom.</p>	<p><b>NGS GENOMIC DATA ANALYSIS</b></p>  <p>The poster shows a laptop, a cell, and a DNA sequence. Text includes 'OMICSLOGIC   GENOMICS', 'Next Generation Sequencing Data', and 'Designed for beginners to develop the ability to Explore and Analyze Genomic Data and its Application in Healthcare, Biotechnology, Agriculture'. It also lists 'FALL SEMESTER INDUSTRIAL &amp; RESEARCH BASED HANDS-ON TRAINING TO DEVELOP' and 'Biological Knowledge   Computational Skills   Statistical &amp; Data Analysis Skills'. Logos for LBRN BIOMMED, NAIPI, OMICSLOGIC, BIOINFP-PLATFORM, and TAUBER are at the bottom.</p>
<p><b>BEGINNER</b></p>	<p><b>INTERMEDIATE</b></p>
<p><b>Introduction to methods for Genomics, Metagenomics, and Transcriptomics Data Analysis.</b></p>	<p><b>With hands-on experience &amp; cutting-edge techniques, uncover the mysteries within genomic data.</b></p>
<p><b>NGS METAGENOMIC DATA ANALYSIS</b></p>  <p>The poster features a cell, a laptop, and a DNA sequence. Text includes 'OMICSLOGIC   NEXT GENERATION SEQUENCING METAGENOMICS', 'Studying the Microbiome through Metagenomic Sequence Analysis', and 'FALL SEMESTER INDUSTRIAL &amp; RESEARCH BASED HANDS-ON TRAINING TO DEVELOP' and 'Biological Knowledge   Computational Skills   Statistical &amp; Data Analysis Skills'. Logos for LBRN BIOMMED, NAIPI, OMICSLOGIC, BIOINFP-PLATFORM, and TAUBER are at the bottom.</p>	<p><b>BIOMEDICAL DATA SCIENCE USING PYTHON</b></p>  <p>The poster shows a laptop, a cell, and a DNA sequence. Text includes 'OMICSLOGIC   NAIPI   LBRN BIOMMED', 'BIOMEDICAL DATA SCIENCE IN PYTHON', 'Data Visualization, Statistical Analysis &amp; Machine Learning in Python', and 'An introduction to basic concepts, scripting, visualization and statistical analysis of complex omics data.' It also lists 'Coding Knowledge   Computational Skills   Statistical &amp; Data Analysis Skills' and shows a code snippet. Logos for LBRN BIOMMED, NAIPI, OMICSLOGIC, BIOINFP-PLATFORM, and TAUBER are at the bottom.</p>
<p><b>INTERMEDIATE</b></p>	<p><b>ADVANCED</b></p>

Program delivery and registration via GeneLab on OmicsLogic: <https://rb.gy/y2zz5>

For more details, reach out to Dr.Emmanuelle Ruiz, Post-Doctoral Researcher, Kousoulas Lab  
(erui210@lsu.edu | Office: 225-578-9084)

**Gain expertise in metagenomic: master sequencing, analysis, integrate datasets, utilize R for advanced insights.**

**Learn about data science in Python, such as data wrangling, visualization, statistical analysis, & machine learning.**

## Key Features

<b>Key Feature For All Fall Semester LSU Biommed Training Programs</b> <b>Biological Knowledge   Computational Skills   Statistical &amp; Data Analysis Skills</b>			
<b>INDUSTRY RELEVANT MODERN CURRICULUM</b>  Designed by Subject Matter Expert from Industry & Accepted by over 30 Universities and Research Institutions working on NGS Data	<b>CODE &amp; NO CODE MODULE</b>  Computational & Data Analytical Skills through Algorithms, Pipelines & Workflows for Meaningful Research. Cloud server for Big Data & Multi-omics Integration & Research Project	<b>LEARN AT YOUR OWN PACE LEARN FROM ANYWHERE</b>  Online Text, Video & Audio for All NGS Data analysis. Practical Course work with Interactive Tutorials, Hands-on Assignments, Quizzes and Scientific Games	<b>EXPERT TEAM FOR NGS DATA ANALYSIS</b>  Bioinformatics & Data Science Support for Personalized Training. Lifetime Access to Virtual Classroom & LMS Training Platform
<b>INTEGRATION OF TOOLS</b>  Commercial Industry Grade Research & Open Source Tools: Public Datasets, Example projects & case studies included in each program	<b>AVAILABLE ONLINE *FULLY FUNDED, PARTIALLY FUNDED</b>  OmicsLogic Scholarships available for selected candidates based on their application and communication with team	<b>CAPSTONE PROJECT &amp; EXPERT FEEDBACK</b>  Option to Engage in a capstone project that encompasses literature review, Exploratory Data Analysis, Project Proposal, and Presentation with Expert Feedback for Research Projects, Grants & Publications	<b>PROGRAM AND COURSE CERTIFICATION</b>  By Tauber Bioinformatics Research Center & Omicslogic, JOB POSTINGS & Opportunities in US, India & Europe
<b>Infrastructure Requirements: Web-Browser based Laptop/Desktop with decent internet connection</b>			

# TRAINING MODULE DETAILS

## **Introduction to Big Data Bioinformatics**

The training program in bioinformatics is an excellent opportunity for individuals to learn about the emerging field of genomics and its applications in biomedical research, biotech industry, and clinical practice. This online program covers the fundamental concepts, tools, and techniques used in bioinformatics research, providing participants with practical skills that can be applied in research, industry, and clinical practice. Even individuals without a background in biology or bioinformatics can learn about NGS data analysis processing. The program provides a comprehensive introduction to bioinformatics with a focus on genomics, transcriptomics, metagenomics, and analysis tools. By the end of the program, participants will be proficient in analyzing and interpreting various -omics data types using bioinformatics, statistical, and machine learning techniques.

### **Included Modules**

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- Introduction to Molecular Biology and Bioinformatics
- Next Generation Sequencing Technology: Types, Principles & Applications
- Introduction to Multi Omics: Genomics, Metagenomics & Transcriptomics
- Systems Biology and Network Analysis
- Statistical Analysis for Multi-Omics Data in Bioinformatics
- An Introduction to Machine Learning for Omics Data Analysis

**Orientation Date:** September 28, 2023

**Commencement Date:** October 05, 2023

## Genomic Data Analysis

Unlock the boundless potential of genomic data analysis through our comprehensive training program offered at three different levels: beginner, intermediate, and advanced. Whether you are just starting your journey or looking to expand your expertise, this program is designed to provide you with the skills and knowledge needed to excel in this rapidly evolving field. At the beginner level, you will develop a strong foundation, exploring bioinformatics, NGS, data exploration, sequence alignment, and more. The intermediate level takes you deeper into intriguing topics such as variant calling, copy number variation analysis, machine learning, genome-wide association studies, and ethical considerations. For those seeking advanced knowledge, we delve into population genetics, DNA sequence analysis, VCF file analysis, functional annotation, and real-life case studies. By joining this program, you will gain practical hands-on experience, learn cutting-edge techniques, and unravel the mysteries hidden within genomic data. Be prepared to unlock a world of exciting possibilities and make significant contributions in the field of genomic data analysis.

### Included Modules

- Bioinformatics Fundamentals and NGS Technologies.
- Genomic Data Exploration and Alignment Techniques.
- Hands-on Phylogenetic Analysis and Alignment.
- Variant Calling, Annotation, and Functional Analysis.
- Specialization Areas in Genomic Data Analysis.
- Case Studies: SARS Cov2 and Breast Cancer Variant Calling.
- Mutations, Variants, Copy Number Analysis, and AI.

**Orientation Date:** September 29, 2023

**Commencement Date:** October 06, 2023

## Metagenomic Data Analysis

Explore the limitless potential of metagenomic data analysis through our comprehensive training program, designed for beginners, intermediate learners, and advanced practitioners. Whether you are starting your journey or seeking to expand your expertise, this program equips you with the skills and knowledge to excel in this dynamic field. Begin by establishing a solid foundation in metagenomics, where you will delve into microbial communities and genetic compositions. Learn advanced sequencing techniques and leverage open-source

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databases as valuable resources. Develop proficiency in data processing and analysis tools, uncovering hidden patterns and gaining insights into community dynamics. Progress to the intermediate level, exploring topics such as microbiome variability, metagenomic data interpretation, and cutting-edge tools like QIIME2 and DADA2. Engage in captivating case studies and explore the functional potential of microbial communities. Advanced learners will explore metagenome-wide association studies, data integration, personalized medicine, advanced analysis using R and visualization tools. Join us on this transformative journey to unlock boundless opportunities in metagenomic data analysis and drive innovation in this rapidly evolving field.

### Included Modules

- Introduction to Metagenomics: Study of microbial communities and genetics.
- Sequencing Techniques: Methods to generate metagenomic datasets.
- Data Generation: Collecting and preparing samples for sequencing.
- Bioinformatics Databases: Accessing reference resources for analysis.
- Data Processing and Analysis: Preprocessing, species identification, and community dynamics.
- Advanced Analysis: DADA2 microbiome variability, QIIME2 pipeline, and diversity assessment.
- Practical Application: Case study on microbiome response to dietary fiber, and functional metagenomics exploration.

**Orientation Date:** September 29, 2023

**Commencement Date:** October 06, 2023

## Biomedical Data Science using Python

Biomedical data science using python training program is designed to equip participants with practical skills in Python programming and its application to biomedical data analysis. The program covers foundational concepts in data processing and cleaning, data visualization, dimensionality reduction, and machine learning using Scikit-Learn and also focuses on advanced machine learning techniques such as clustering, model validation, and evaluation metrics for supervised learning models, as well as decision trees, random forests, and support vector machines (SVMs). Participants will work with real-world biomedical datasets and gain a deep understanding of how to apply these techniques to research problems. The program is structured as a combination of online resources, practical assignments, and live workshops conducted online.

### Included Modules

- Python basics for data analysis
- Data preprocessing and cleaning techniques using NumPy and Pandas libraries
- Exploratory data analysis and data visualization using Matplotlib and Seaborn libraries
- Dimensionality reduction techniques such as PCA, t-SNE, and UMAP
- Unsupervised learning algorithms such as K-Means, Hierarchical Clustering, and Spectral Clustering using Python clustering packages like SciKit and SciPy

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- Model validation techniques and evaluation metrics for supervised machine learning models
- Supervised learning algorithms such as Decision Trees, Random Forest, SVM, LDA
- Advanced machine learning techniques for biomedical data analysis, such as Neural Networks and Deep Learning using Keras and TensorFlow
- Case studies and real-world biomedical datasets to reinforce the concepts covered in the program.

**Orientation Date:** September 28, 2023

**Commencement Date:** October 05, 2023