

WORKSHOP

“Unlocking the Potential of MinION: A Hands-On Genomic Sequencing Workshop”



Tunis 26-27th September 2024

*Higher Institute for Biotechnology
University of Manouba*

THURSDAY, 26TH SEPTEMBER 2024

09:00 – 09:15	Welcome and registration
09:15 – 10:30	Introduction - CIRQUA concept in bioinformatics (SN & GT) - Introduction to third-generation sequencing (NB) - Applications and techniques (NB & JG)
10:30 – 11:00	Coffee break
11:00 – 12:15	Working environment - Introduction to the Linux operation system (NB) - MinION set-up (JG) - Framework setup (NB & JG)
12:15 – 13:45	Lunch break
13:45 – 14:30	Bacterial genomic analysis - Oxford Nanopore libraries (JG) - Experimental challenges and best practice (JG) - Analysis pipeline (NB)
14:30 – 15:00	Coffee break
15:00 – 17:00	Hands-on bacterial genome analysis (NB & JG) - Quality control of raw data - Genome assembly - Genome annotation & Metrics of the assembly - Taxonomy assignment

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FRIDAY, 27TH SEPTEMBER 2024

💧 09:00 – 09:45	Targeted metagenomic analysis - Oxford Nanopore libraries (JG) - Experimental challenges and best practice (JG) - Analysis pipelines, tools, and techniques (NB)
💧 09:45 – 10:15	Coffee break
💧 10:15 – 12:15	Hands-on targeted metagenomic analysis (16S rDNA) (NB & JG) - Quality control of raw data - Read clustering and polishing - Taxonomy assignment
💧 12:15 – 13:45	Lunch break
💧 13:45– 15:00	Hands-on targeted metagenomic analysis (NB & JG) - Downstream analyses of targeted metagenomic data using the “MetaXplore” platform
💧 15:00 – 15:30	Coffee break
💧 15:30 – 16:45	Open session - Participant project-specific insight, questions and challenges
💧 16:45 – 17:00	Workshop closing

1.1.1 Requirements

The target audience is **biologists or data analysts** with no or little experience in analyzing NGS data. A fundamental understanding of molecular biology (DNA, RNA, gene expression, PCR) is assumed.

A basic knowledge of Linux & Bioinformatics (command line usage, common commands and tools) is beneficial, but not required.

All selected participants are required to bring their own laptops.

To ensure a smooth and productive experience, please make sure your laptop meets the following minimum requirements:

- ◆ **Operating System:** Windows 10 (64-bit), macOS 10.14 or later, or a recent version of Linux (with GUI support)
- ◆ **Processor:** Intel i5 or equivalent (AMD Ryzen 5 or higher recommended)
- ◆ **RAM:** 8 GB (16 GB or higher recommended for optimal performance)
- ◆ **Storage:** At least 100 GB of free disk space
- ◆ **Internet:** Stable Wi-Fi capability
- ◆ **USB Ports:** At least one available USB 3.0 port
- ◆ **Software:** A virtual environment will be installed during the first day of the workshop
- ◆ **Permissions:** Ensure you have administrative rights to install and configure software during the workshop
- ◆ **Browser:** Latest version of Chrome, Firefox, or Safari

By meeting these requirements, you will be able to fully participate in all workshop activities and gain the most from the hands-on experience.

If you have any questions or concerns regarding your laptop specifications, please contact us ahead of the workshop.

1.1.2 Included in the Course

- ◆ Course materials
- ◆ Catering during the workshop
- ◆ Workshop dinner
- ◆ Downloadable environment for seamless continuation / repetition after the course
- ◆ Certificate

1.1.3 Attendance

Location: Higher Institute for Biotechnology - University of Manouba

Language: English

Available seats: 20

NO Registration Fee

Travel expenses and accommodation are not covered by the workshop.

1.1.4 Key dates

Opening Date of Application: 16th of August, 2024

Closing Date of Application: 10th of September, 2024

Workshop: 26th - 27th of September, 2024 (9 am - 5 pm)

1.1.5 Organizers & Speakers



Prof. George Tsiamis (GT) is an expert in Environmental Microbiology, currently holding a teaching and research position at the University of Patras. With a robust background in bioinformatics, he specializes in microbial ecology, next-generation sequencing, and data analysis. His work focuses on understanding the complexity of microbial communities in various environments and their interactions with their surroundings.



Dr. Panagiota Stathopoulou (PS) is an accomplished Assistant Professor of Biotechnology. With extensive academic and research experience, she focuses on integrating biotechnological principles with cutting-edge molecular techniques to solve complex biological problems. Her work spans microbial molecular biology, genomics, and enzymology contributing significantly to advancements in biotechnology. Dr. Stathopoulou's research work has been widely recognized and published in prominent scientific journals, contributing to the understanding and advancement of biotechnology through bioinformatics.



Dr. Naima Bel Mokhtar (NB) is a dedicated researcher in the field of microbiome studies with a particular focus on using next-generation sequencing (NGS) technologies. Since embarking on her scientific career, she has made significant strides in the study of host-microbe interactions through advanced sequencing techniques. With a solid foundation in amplicon sequencing, Dr. **Bel Mokhtar** has progressively expanded her expertise to include targeted and shotgun metagenomics, positioning herself as a versatile and innovative force in her field.



Mr Yiannis Galiatsatos (JG) is a highly skilled researcher and expert in the field of nanopore sequencing technology, particularly with the MinION platform. His work is distinguished by his expertise in preparing MinION sequencing libraries and developing custom protocols tailored to specific research needs. With a strong background in molecular biology and sequencing technologies, Yiannis has significantly contributed to the optimization and enhancement of sequencing workflows, facilitating advanced genomic research.



Dr Mouna MAHJOUBI is a postdoctoral researcher at the Laboratory of Biotechnology and Bio-Geo Resources Valorization (LR11ES31), Higher Institute for Biotechnology, University of Manouba, Tunisia. She obtained her PhD in Biotechnological Sciences from the Faculty of Sciences of Bizerte (FSB), University of Carthage, Tunisia, in 2018. Her current research activities focus on several aspects of Molecular Microbial Ecology and Biotechnology, particularly i) the characterization of microbial community dynamics and the bioremediation potential of hydrocarbonoclastic bacteria in marine polluted ecosystems through genomic and analytical analysis and ii) the ecology of extremophilic microorganisms. Dr. Mahjoubi has published 30 peer reviewed papers.



Prof. Spyridon Ntougias (SN) is the Coordinator of CIRQUA and an expert in Environmental Microbiology, currently holding a teaching and research position at the Democritus University of Thrace. With a robust background in applied microbiology, he specializes in bioremediation, microbial ecology and next-generation sequencing. His work focuses on the valorisation of microbial communities on various environmental applications, including wastewater treatment and water purification.

1.1.6 Application Instructions

Contact Us:

- Prof. George Tsiamis (gtsiamis@upatras.gr)
- Assist. Prof. Panagiota Stathopoulou (panstath@upatras.gr)
- ISBST Contact: Prof. Rim Chaouachi (rim.driouech@isbst.uma.tn)
- ATEM contact: Prof. Imen Ouzari (imene.ouzari@fst.utm.tn)

Please register through: <https://form.jotform.com/242122216139345>



In addition to your application form, be sure to include a short CV highlighting your relevant qualifications and experience.

Welcome to the MinION Bioinformatics Workshop 2024!



This project, entitled “Integrated Approaches at Local Scale for Enhancing Water Reuse Efficiency and Sustainable Soil Fertilization from Wastewater’s Recovered Nutrients”, acronym ‘CIRQUA”, Grant agreement No. 2321, Call 2023 Section 1 Management of Water IA, is part of the PRIMA programme supported by the European Union. This content reflects only the author’s view. The PRIMA Foundation is not responsible for any use that may be made of the information it contains.