

Certificat International en Bioinformatique & Génomique 2026

Bioinformatics in practice: learning by doing!

📅 5 October - 20 November 2026

📍 Abidjan, Côte d'Ivoire

✉ bioinfo@wave-center.org

➤ What is the CIBiG?

The International Certificate in Bioinformatics and Genomics (CIBiG) is an intensive training program designed for PhD students and researchers working with sequencing technologies and data. The course provides a comprehensive introduction to genomics and bioinformatics, with practical sessions focused on applying bioinformatics methods to sequencing data, particularly in the context of health and agriculture.

The program includes an online preparatory course, followed by an on-site session in Abidjan, and ends with a practical internship/project of 2 months.

🎓 Our objectives

- Gain a thorough understanding of fundamental bioinformatics concepts.
- Develop practical skills in sequencing data analysis.
- Apply bioinformatics to real-world challenges in agriculture and health in Africa.
- Master Linux and bioinformatics tools to carry out your own analysis independently.
- Collaborate on practical projects to directly apply acquired skills.
- Communicate for training and knowledge transfer, both orally and in writing.
- Integrate open science and reproducibility into your work.

❓ Practical information

🕒 **Online course:** 5-16 October

🕒 **On-site course:** 26 October - 20 November

📍 **Place:** WAVE Regional Center of Excellence, Univ. Félix Houphouët-Boigny
Bingerville, Abidjan

👤 **Target audience:** Students, researchers, computer engineers in companies or public institutions.

📖 **Admission requirements:** Master's degree (or equivalent) in life or health sciences. Bachelor's degree + 5 years of experience for professionals from research institutes or technical ministries.

💰 **Fees:** 2,500,000 FCFA (3800 euros)

👥 **Application:** Open with selection — 15 places

🌐 <https://wave-centre.github.io/cibig/>

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Key Dates

- **Applications open:** 19 march
- **Applications deadline:** 20 April
- **Acceptance notification:** 29 May
- **3-minute icebreaker video deadline:** 28 Sept.
- **Online courses:** 5 Oct. – 16 Oct.
- **On-site session:** 26 Oct. – 20 Nov.
- **Final restitution:** 20 Nov. at 16 pm
- **Internship period:** 25 Jan.– 31 Mar.
- **Internship restitution:** 13, 14, 15 April

Online Courses Overview

10 half-days sessions (4h) over two weeks — mornings, 8:00-12:00 GMT

- **Microorganism Biology Overview** - 5 Oct.
Dr. Fidèle TIENDREBEOGO (WAVE)
- **Eukaryotic Cell Biology Overview** - 6 Oct.
Dr. Romaric Kiswendsida NANEMA (Univ. J. Ki-Zerbo)
- **Mendelian Genetics & Diversity** - 7 Oct.
Dr Yann BOURGEOIS (IRD) & Dr. Romaric Kiswendsida NANEMA (Univ. J. Ki-Zerbo)
- **Genome Structure & Variation** - 8 Oct.
Dr. Perla FARHAT (IRD) & Dr. François Sabot (IRD)
- **AI Learning Roadmap** - 9 Oct.
Dr Bertrand COSSON (Univ. Paris Saclay)
- **Sequencing Methods and Application** - 12 Oct.
Dr. François SABOT (IRD)
- **Bioinformatics Roadmap: Concepts and Application in Genomics** - 13-14 Oct.
Dr. Perla FARHAT (IRD) & Dr. François SABOT (IRD)
- **Applications in Health & Environment** - 15-16 Oct.
Case studies: human health, agriculture and plant genomics.
2 half-days, 2 speakers per session
Dr. Juliette HAYER (IRD), Dr. Marguerite Edith M. NIKIEMA (INERA/CNRST)
Dr. Damien RICHARD (IRD), Dr. Remy TOURNEBIZE (IRD)

📅 On-line Course Timetable by Week (5 Oct. – 16 Oct.)

➤ week 5-9 October

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
08:00 - 09:00	Microorganism Biology Overview	Eukaryotic Cell Biology Overview	Mendelian Genetics & Diversity	Genome Structure & Variation	AI Learning Roadmap	
09:00 - 10:00	F. Tiendrebeogo	R. K. Nanema	Y. Bourgeois & R. K. Nanema	P. Farhat & F. Sabot	B. Cosson	
10:00 - 11:00						
11:00 - 12:00						
12:00 - 13:00						
13:00 - 14:00						
14:00 - 15:00						
15:00 - 16:00						
16:00 - 17:00						
17:00 - 18:00						
18:00 - 19:00						

➤ week 12-16 October

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
08:00 - 09:00	Sequencing Methods and Application	Bioinformatics Roadmap	Bioinformatics Roadmap	Applications in Health & Environment	Applications in Health & Environment	
09:00 - 10:00	F. Sabot	P. Farhat	F. Sabot	J. Hayer	Damien Richard	
10:00 - 11:00				Applications in Health & Environment	Applications in Health & Environment	
11:00 - 12:00				E. Nikiema	R. Tournebize	
12:00 - 13:00						
13:00 - 14:00						
14:00 - 15:00						
15:00 - 16:00						
16:00 - 17:00						
17:00 - 18:00						
18:00 - 19:00						

On-site Course Modules Overview

Sequencing

Develop practical laboratory skills from DNA and RNA extraction to sequencing.

Dr. P. Estel NAME, Dr. Edith NIKIEMA Dr. Cyrielle NDOUGONNA, Dr. Ezechiel TIBIRI

OMICS

Understand omics data types and apply algorithmic and Linux skills in guided bioinformatics pipelines and analyses with real biological datasets.

Alexis DEREPPER, Dr Christine TRANCHANT, Dr. Cyrielle NDOUGONNA, Dr. Ezechiel TIBIRI

Biological Databases

Explore public biological databases to search, retrieve and analyze sequences, genomes, and scientific publications using online bioinformatics resources and tools.

Dr. Ezechiel TIBIRI Dr. P. Estel NAME, Dr. Cyrielle NDOUGONNA

OMICs Project

Work in groups to design and conduct a bioinformatics analysis of omics data addressing a real biological question.

Project A : *Dr. Yann BOURGEOIS, Julie ORJUELA*
Project B: *Dr. Damien RICHARD, Dr. Fidèle TIEN-DREBEOGO*

All teaching staff will provide guidance and support during the project: Dr. Fidèle TIENDREBEOGO, Dr. Romaric NANEMA.

Algorithmics

Discover the fundamentals of algorithmic thinking, including problem solving and algorithm design, independent of any programming language.

Dr. Koissi SAVI, Dr. Christine TRANCHANT, Dr. Cyrielle NDOUGONNA, Dr. Siedou SORY

Programming (Python/R)

Hands-on training with Python and R for data analysis, scripting, and visualization.

Julie ORJUELA, Dr Mickaël LUCAS

Alexis DEREPPER

Dr. Koissi SAVI, Dr. Damien RICHARD

Dr. Yann BOURGEOIS

Linux for bioinformatics

Develop practical skills with the Linux command line to run bioinformatics analyses on high-performance computing (HPC) clusters.

Dr. Ezechiel TIBIRI, Dr. Christine TRANCHANT, Dr. Isaac ABEGUNDE, Dr. Siedou SORY

Reproducible Research

Explore the data lifecycle in scientific projects and discuss strategies to ensure reproducibility throughout the research process.

Dr. Koissi SAVI, Julie ORJUELA, Dr. Christine TRANCHANT, Dr. Mickaël LUCAS,

HPC Computing for bioinformatics

Get started with HPC computing: learn to submit jobs using SLURM, manage computational resources, and run bioinformatics analyses on clusters.

Ndomassi TANDO, Julien SEILER, Serge ANOMAN, Dr. Ezechiel TIBIRI, Dr Siedou SORY

Version control with Git

Learn how Git helps track changes, manage versions, collaborate on projects, and share code efficiently.

Dr. Koissi SAVI, Dr. Mickaël LUCAS Julie Orjuela, Dr. Christine TRANCHANT

⚙️ Introduction to Containers

Develop practical skills in using containers to deploy and run portable, reproducible bioinformatics workflows.

Julie ORJUELA, Dr. Ezechiél TIBIRI

📅 On-site Course Timetable by Week (26 Oct. – 20 Nov.)

➤ week 1 : 26-31 October

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
08:00 - 09:00	Welcome	Sequencing	Sequencing	Sequencing	Biological Database	
09:00 - 10:00	Amphi	Lab TP	Lab TP	Lab TP	room 1 CM	
10:00 - 11:00	Break	Break	Break	Break	Break	
11:00 - 12:00	Seminar	Sequencing	Sequencing	Sequencing	Biological Database	
12:00 - 13:00	Amphi presentation	Lab TP	Lab TP	Lab TP	room 1 TP	
13:00 - 14:00	Lunch	Lunch	Lunch	Lunch	Lunch	
14:00 - 15:00	Sequencing Amphi Cours	Sequencing Lab TP	Sequencing Lab TP	Sequencing Lab TP	Biological Database room 1	IDE setup& Markdown Intro room 1 TP
15:00 - 16:00	Break	Break	Break	Break	Break	
16:00 - 17:00	Sequencing Amphi Cours	Sequencing Lab TP	Sequencing Lab TP	Lab Session Restitution Amphi presentation	Biological Database room 1	Linux envt setup room 1 TP
17:00 - 18:00						
18:00 - 19:00						

➤ week 2 : 2-7 November

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
08:00 - 09:00	Biological Database	ALGO	LINUX	LINUX	CLUSTER	
09:00 - 10:00	room 1 CM	room 1 TP	room1 TP	room 1 TP	room 1 TP	
10:00 - 11:00	Break	Break	Break	Break	Break	
11:00 - 12:00	Biological Database	ALGO	LINUX	LINUX	CLUSTER	
12:00 - 13:00	room 1 TP	room 1 TP	room1 TP	room 1 TP	room 1 TP	
13:00 - 14:00	Lunch	Lunch	Lunch	Lunch	Lunch	
14:00 - 15:00	ALGO room 1	LINUX room 1 TP	review session room 1	LINUX room 1 TP	OMICS room 1	Jupyter book room 1 TP
15:00 - 16:00	Break	Break	Break	Break	Break	
16:00 - 17:00	ALGO room 1	LINUX room 1	review session room 1	LINUX room 1 TP	OMICS room 1	github configuration room 1 TP
17:00 - 18:00						
18:00 - 19:00						

➤ week 3 : 9-14 November

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
08:00 - 09:00	OMICS	OMICS	OMICS	Python R	Python R	
09:00 - 10:00	room 1 TP	room 1 TP	Room 1 TP	Room 1,2 TP	Room 1,2 TP	
10:00 - 11:00	Break	Break	Break	Break	Break	
11:00 - 12:00	OMICS	OMICS	OMICS	Python R	Python R	
12:00 - 13:00	room 1 TP	room 1 TP	Room 1 TP	Room 1,2 TP	Room 1,2 TP	
13:00 - 14:00	Lunch	Lunch	Lunch	Lunch	Lunch	
14:00 - 15:00	OMICS	OMICS	review session	Python R	Python R	OMICS project
15:00 - 16:00	room 1 TP	room 1 TP	room 1	Room 1,2 TP	Room 1,2 TP	room 1 TP
16:00 - 17:00	OMICS	OMICS	review session	Python R	OMICS project	OMICS project
17:00 - 18:00	room 1 TP	room 1	room 1	Room 1,2 TP	room 1,2 group	room 1 TP
18:00 - 19:00						

➤ week 4 : 16-21 November

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
08:00 - 09:00	Python R	OMICS project	REPRO - Git	OMICS project	OMICS project	
09:00 - 10:00	Room 1,2 TP	room 1,2 group	room 1 TP	room 1,2 group	room 1,2 group	
10:00 - 11:00	Break	Break	Break	Break	Break	
11:00 - 12:00	Python R	OMICS project	REPRO - Git	OMICS project	OMICS restitution	
12:00 - 13:00	Room 1,2 TP	room 1,2 group	room 1 TP	room 1,2 group		
13:00 - 14:00	Lunch	Lunch	Lunch	Lunch	Lunch	
14:00 - 15:00	Python R	Repro - Data Lifecycle	review session	REPRO - Conda	OMICS restitution	
15:00 - 16:00	Room 1,2 TP	room 1 TP	room 1	room 1 TP		
16:00 - 17:00	Break	Break	Break	Break	Debriefing	
17:00 - 18:00	OMICS project	Repro - Data Lifecycle	review session	review session	Wrap up	
18:00 - 19:00	room 1,2 group	room 1 TP	room 1	room 1		

Pre-course Resources

Before attending the on-site session, participants must review the following online resources. These videos or tutorials cover key concepts and tools needed for the course. Each one has a deadline.

Sequencing

 25 October

	Why study DNA sequencing and computational genomics?	4'30
	Sanger DNA Sequencing, From Then to Now. <i>(optional)</i>	15'
	NGS - A Step-By-Step Guide to DNA Sequencing. <i>(optional)</i>	7'40
	Overview of Illumina Sequencing	5'15
	How nanopore sequencing works	1'41
	Nanopore DNA sequencing <i>(optional)</i>	4'30

Biological Databases

 Before 29 October

› 12 Common Bioinformatics File Types Explained

 *Watch only the first 10 file formats.*

Algorithmics

 Before 1 November

	Un algorithme c'est quoi?	5'25
	Les variables et les types	6'45
	Les opérateurs	6'45
	Lecture et écriture	6:39
	Les chaînes de caractères	3:57
	Les conditions (Si - Sinon) - Structures conditionnelles	5:46
	Structure sélective Selon	3:12
	Boucle TantQue - Structures	6:49

 *Content in French.*

> Linux & Markdown

📅 before 1 November

> Linux

📄 Essential unix for bioinformatics I	18'40
📄 Essential unix for bioinformatics II	15'40
📄 Unix superpowers (using pipes and ssh)	(optional) 17'40
📄 The Unix Shell	-

> Markdown

📄 Quick Start Guide To Markdown	(optional)
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📄 Watch only up to the Markdown editor section included.

📁 Cluster Computing

📅 5 November

📄 Slurm Tutorial: HPC Job Submission Systems for Beginners	11'30
📄 HPC Data Management for NGS Analysis	10'30

</> Programming (Python/R)

>Python 📅 before 11 Nov

📄 Plotting and Programming in Python	
📄 Programmation en Python pour les sciences de la vie	(optional)

>R 📅 before 11 Nov

📄 R BASICS	(optional)
📄 R for Reproducible Scientific Analysis	

♻️ Reproducibility

📄 Jupyter Notebook Complete Beginner Guide	(optional) 25'30
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📄 Watch only up to the Jupyter Lab section included.

Git

📄 Version Control with Git	(optional)
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👤 Trainers

Meet the CIBiG2026 teaching team, an international and multidisciplinary group of experts in human health, plant health, and plant breeding, from West Africa and France. They bring their research experience and practical knowledge in the fields of genetics, genomics, and bioinformatics.



Isaac Oloruntoba
ABEGUNDE -
Covenant
University



Serge ANOMAN -
WAVE



Palwendé
Romuald BOUA -
IRSS



Yann
BOURGEOIS -
IRD



Bertrand
COSSON - Univ.
Paris Saclay



Alexis
DEREPPER - IRD



Perla FARHAT -
IRD



Juliette HAYER -
IRD



Michael LUCAS -
IRD



Pakyendou Estel
NAME - WAVE



Romaric K.
NANEMA - Univ.
Joseph Ki-Zerbo



Cyrielle
NDOUGONNA -
WAVE



Marguerite Edith
M. NIKIEMA-
CNRST/INERA



Julie ORJUELA-
BOUNIOL - IRD



Damien Richard -
IRD



François SABOT-
IRD



Koissi SAVI-
WAVE



Julien SEILER-
IFB



Siedou SORY -
INERA



Ndomassi
TANDO- IRD



Ezechiel
Bionimian TIBIRI -
WAVE



Fidèle
TIENDREBEOGO
- WAVE



Remi Tournebize -
IRD



Christine
TRANCHANT-
DUBREUIL - IRD

Working Environment

 **Shared folder:** *Online course slides & evaluations*

 **Public Repository:** <https://github.com/wave-centre/training/blob/main/CIBIG>
Repository for on-site course teaching materials

 **Slack Channel:** cibig-wave.slack.com
Slack enables real-time communication, resource sharing, and quick support among participants and instructors.

 **Recommended Software :** (to be updated)
Below is a list of recommended tools to install before the on-site session:

Software	Purpose
Ubuntu/Linux	Operating system or virtual machine environment
Miniconda	Package and environment manager (Python/R)
Python	General-purpose programming language
Jupyter Notebook	Interactive notebooks for coding and documentation
R / RStudio	Statistical computing and data visualization
Git	Version control and code collaboration
Spyder	Integrated development environment (IDE) for Python

*The CIBiG program is more than a training —
it's a gateway to autonomy, collaboration, and innovation
in bioinformatics and genomics for West and Central Africa.*

*We work hard, we learn deeply, and we laugh together —
because science grows best in a supportive and engaging community.*

For any further questions,
contact us at bioinfo@wave-center.org
or visit our website <https://wave-centre.github.io/cibig/>.
We look forward to welcoming you to the CIBiG 2025 training session in Abidjan!

