

Preparing the next generation of scientists

A CORE FOUNDATION AND THE OPTION TO SPECIALIZE

This 50-hour training program required for all Institut Pasteur PhD students begins with a group of common core courses including a knowledge base in reproducible research, R Programming and Statistics. Each student then chooses a track of additional modules—Bioinformatics or Image Analysis—according to their background and field of research. Students already proficient in R programming and statistics can skip certain modules or the entire track.

INSTITUTIONAL RECOGNITION

This PhD program has been acknowledged by the doctoral schools CdV, FIRE, SDSV and Bio SPC.



A TARGETED CURRICULUM DEVELOPED BY THE COMPUTATIONAL BIOLOGY DEPARTMENT

In accordance with a request in 2016 from the former General Board of Directors, a training program dedicated to PhD students was developed. This program is now offered and animated by the Bioinformatics and Biostatistics Hub and the Image Analysis Hub. Each and every student at the institute must attend at least 50 hours of training. At the minimum, he or she is required to validate the statistical modules (which, depending on their background, some students may skip), and possibly choose additional modules according to his or her background and field of research.

MORE INFORMATION

Course web pages:

<https://research.pasteur.fr/fr/course/bioinformatics-program-for-phd-students/>

www.pasteur.fr/en/bioinformatics-program-phd-students

A detailed description of the modules: bit.ly/phdcourse2021

Contact the Institut Pasteur Department of Computational Biology about education and training at: bioinfo-program@pasteur.fr

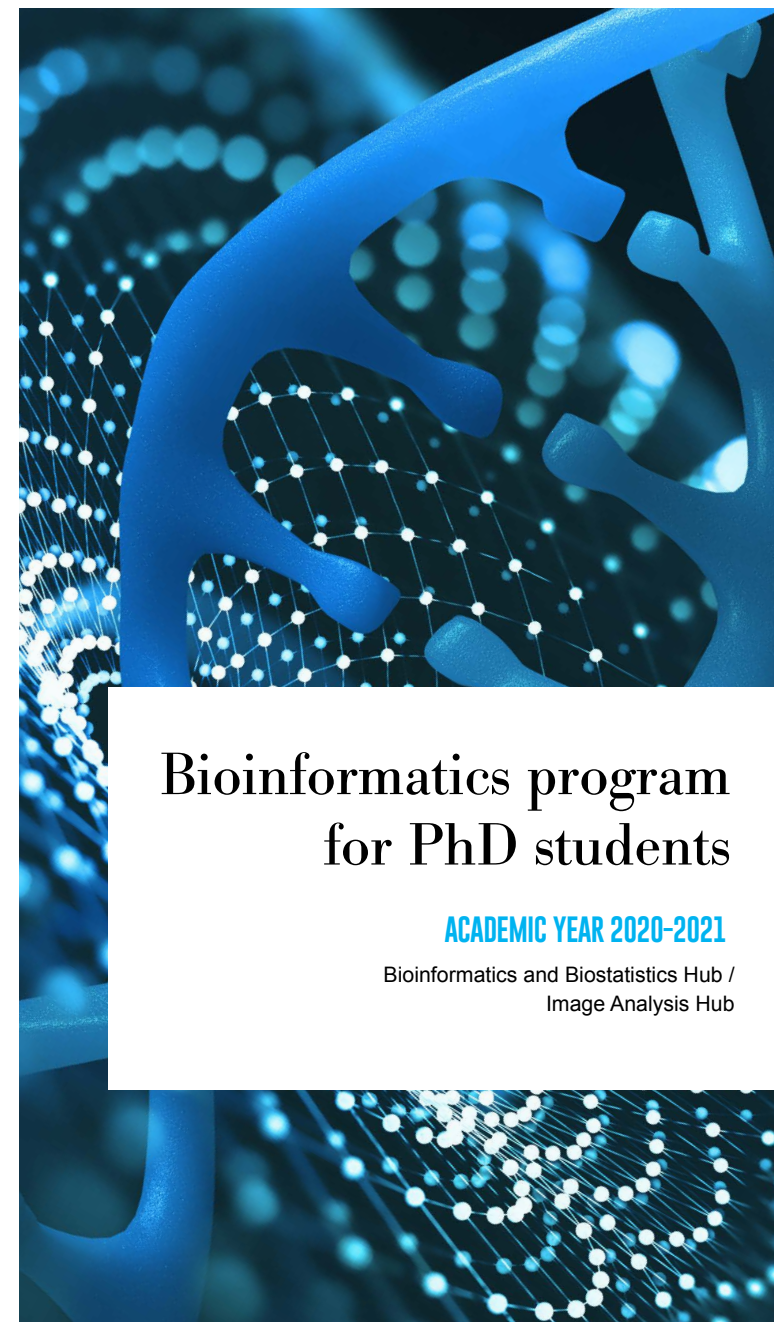


The Bioinformatics program for PhD students was made possible by a grant from the INCEPTION program:

<https://www.inception-program.fr/en>

Institut Pasteur
25-28, rue du Docteur Roux,
75724 Paris Cedex 15

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Bioinformatics program for PhD students

ACADEMIC YEAR 2020-2021

Bioinformatics and Biostatistics Hub /
Image Analysis Hub

Mandatory common core

This one-day, six hour course is required for all PhD students.

- **Introduction to the course, the Department, and the Hub**
- **Computer science 101**
- **Experimental design**
- **Good practices and reproducibility**
- **Ethics, good scientific conduct and plagiarism**
- + **Assessment to determine appropriate track**

TEACHERS: F. Lemoine, N. Maillet, V. Guillemot, M. Thomas-Chollier

LOCATION AND TIMES

SESSION 1: ~~October 15 / 9:30am -12:30pm & October 16th / 1:30-4:45pm online~~

SESSION 2: ~~February 12, Agnès Ullmann Amphitheatre / 9:30am -12:30pm, 2-5pm~~ Feb. 11, morning at

R Programming and Statistics (RS)

Knowledge of R programming and Statistics is mandatory for all Pasteur PhD students. Students already proficient in any one of these topics can skip any or all modules in this track.

RS1 Introduction to R and statistics (18h)

SESSION 1: November 17-20, 2020 (mornings) online

SESSION 2: ~~April 6-8, 2021~~ April 6, 7, 8 and 9, 2021 (mornings)

RS2 Hypothesis testing (12h)

SESSION 1: November 23, 24, 26, 27, 2020 (mornings) online

SESSION 2: ~~April 12-13, 2021~~ April 12, 13, 15 and 16, 2021 (mornings)

RS3 Linear models (12h)

SESSION 1: Nov. 30, Dec. 1, 3, 4, 2020 (mornings) online

SESSION 2: ~~April 20-21, 2021~~ April 19, 20, 22 and 23, 2021 (mornings)

RS4 Multivariate analyses (12h)

SESSION 1: December 7, 8, 10, 11, 2020 (mornings) online

SESSION 2: ~~April 27-28, 2021~~

TEACHERS: B.Li, S. Mella, A. Davidovic, T. Obadia, P. Campagne, E. Perthame, H. Varet, H. Julienne, V. Saint-André

LOCATION AND TIMES

SESSION 1: 9:30am-12:30pm online

SESSION 2: Rooms 2 & 3, Education Center / 9:30am-12:30pm, 2-5pm

Bioinformatics (B)

The first four modules are independent. The other modules require to have followed other modules of the (Bioinformatics or Statistics) track beforehand. Please check the prerequisites before registering.

B1 Unix basic commands (12h)

March 15-16, 2021

B2 Introduction to sequence analysis (12h)

March 17-18, 2021

B3 Proteomics data analysis (12h)

April 15-16, 2021

B4 Refresher on utilities for HTS data analysis (6h)

March 19, 2021

B5 Basic concepts in HTS data analysis (6h)

March 22, 2021 Prerequisite: B4

B4- and B5-dependant modules:

B4, B5 → B6 Expression, quantification, differential analysis (6h)

March 23, 2021 Prerequisites: B4 + B5

B7 Variant calling (6h)

March 24, 2021 Prerequisites: B4 + B5

B8 Genotype data & association studies (6h)

March 25, 2021 Prerequisites: B4 + B5

B9 ChIP-seq data analysis (6h)

March 29, 2021 Prerequisites: B4 + B5

B10 Phylogenetics

March 26, 2021 Prerequisite: B1 + B4 + B5?

B6-dependant modules:

B6 → B11 Single cell analysis (6h)

March 30, 2021 Prerequisite: B6

B12 Functional analysis (12h)

April 1-2, 2021 Prerequisite: RS1 + B5 + B6

B13 Metagenomics (6h)

March 31, 2020 Prerequisites: B1 + B6

TEACHERS: N. Maillet, J. Guglielmini, T. Bigot, Q. Giai-Gianetto, V. Hourdel, C. Chica, C. Malabat, R. Legendre, H. Varet, A. Pain, E. Perthame, P. Campagne, V. Saint-André, N. Pietrosoli, A. Ghazlane, A. Criscuolo, A. Vaysse

LOCATION AND TIMES

Room 6, Education Center / 9:30am-12:30pm, 2-5pm

Image Analysis (IA)

This track serves as a practical introduction to the common tools of Bioluminescence Image Analysis. It is designed for students with no prior knowledge in image analysis.

IA1 Getting started in Bioluminescence Analysis with Fiji (6h)

SESSION 1: December 15, 2020

SESSION 2: June 1, 2021

IA2 Using Icy for Bioluminescence Analysis (3h)

SESSION 1: December 16, 2020 (morning)

SESSION 2: June 2, 2021 (morning)

IA3 Advanced Icy features: scripting and protocols (3h)

SESSION 1: December 16, 2020 (afternoon)

SESSION 2: June 2, 2021 (afternoon)

IA4 Reconstruction of super-resolution images (3h)

SESSION 1: December 17, 2020 (morning)

SESSION 2: June 3, 2021 (morning)

IA5 Using Machine Learning for Bioluminescence analysis (3h)

SESSION 1: December 17, 2020 (afternoon)

SESSION 2: June 3, 2021 (afternoon)

TEACHERS: J.-Y. Tinevez, S. Rigaud, B. Lelandais, D. Ershov, M. Louveaux

LOCATION AND TIMES

SESSION 1: Yersin Building, Ground Floor teaching room / 9:30am-12:30pm, 2-5pm

SESSION 2: Room 6, Education Center / 9:30am-12:30pm, 2-5pm

