

# Qlife

# Quantitative Biology Winter School Series

## WHEN EPIGENETICS MEET CHROMOSOMES

A JOINT PROGRAM OF THE INTERNATIONAL COURSE ON EPIGENETICS & THE QLIFE WINTER SCHOOL SERIES IN QUANTITATIVE BIOLOGY

MARCH 22<sup>ND</sup> - 31<sup>ST</sup>, 2023 - PARIS

### LECTURERS & SPEAKERS

Stein AERTS, Louvain  
Benjamin AUDIT, Lyon  
Pascal BARBRY, Nice  
Naama BARKAI, Tel Aviv  
Laura CANTINI, Paris  
Giacomo CAVALLI, Montpellier  
Antoine COULON, Paris  
Ines DRINNENBERG, Paris  
Olivier ESPÉLI, Paris  
Eileen FURLONG, Heidelberg  
Daniel GERLICH, Vienna  
Bassam HAJJ, Paris  
Edith HEARD, Heidelberg  
Daniel JOST, Lyon  
Ivan JUNIER, Grenoble  
Gaëlle LEGUBE, Toulouse  
Jean-Baptiste MASSON, Paris  
Judith MINE-HATTAB, Paris  
Leonid MIRNY, Cambridge (USA)  
Thierry MORA, Paris  
Marcelo NOLLMANN, Montpellier  
Vera PANCALDI, Toulouse  
Maria-Helena TORRES-PADILLA, Munich  
Stephan UPHOFF, Oxford  
Cédric VAILLANT, Lyon  
Céline VALLOT, Paris

### CO-ORGANIZERS

Geneviève ALMOUZNI, Paris  
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Terence STRICK, Paris

The chromosomal organization of genomes reflects the needs for both compaction, due to space constraints, and accessibility to allow proper processing of genetic information when required. Active and inactive states of genomic regions are achieved thanks to a combination of physical and epigenetic determinants. Therefore, both physical and biological approaches are required to fully understand this organization. The biological approaches include for instance the High-C approaches to determine the relation between DNA sequence, local chromosome folding and epigenetic states resulting from DNA methylation, histone modification, and chromatin compaction, which affect gene expression. The physical approaches include experimental tools which allow one to probe the mechanical states of the chromosome, for instance by directly pulling on chromosomes (inside the nucleus or extracted from the nucleus) or by observing their flexibility and crowding, and draw on theoretical concepts that emerge from the field of polymer physics. Combined, these approaches promise to help us crack the chromosome code which relates the 3D organization of the genome in the nucleus to its function throughout all stages of the cell cycle.

Students can apply to this course according to two different modalities: the theoretical course + digital workshops or the theoretical course + platform visits.

The **theoretical course + digital workshops** will assemble world-leading experts from diverse fields to provide attendees with both the theoretical basis and practical data analysis know-how needed to develop a multiscale understanding of how chromosomes are organized. It is open to M2 and PhD students, as well as postdocs, engineers and junior scientists with backgrounds in life science, physics, computer science and mathematics. The course will extend from Wednesday, March 22<sup>nd</sup> to Friday, March 31<sup>st</sup>. Attendance is limited to 24 students and a basic experience in file manipulation under Unix/Linux and coding ability in Python or R are required.

The **theoretical course + platform visits** is similar to previous years International Course on Epigenetics. It includes introductory lectures, advanced seminars, student poster and article presentations, platform visits,... It is exclusively open to M2 and PhD students. The main part of the theoretical course will extend from Wednesday, March 22<sup>nd</sup> to Wednesday, March 29<sup>th</sup>. Attendance is limited to 16 students.

Additional information is available on: <https://www.enseignement.biologie.ens.fr/spip.php?article262>

APPLICATION DEADLINE DECEMBER 11<sup>TH</sup>, 2022

REGISTRATION FEES: 150 €\*

- Registration link: <https://forms.office.com/r/7iNKpZKENT>
- In addition, provide a CV, a 1 page motivation letter (including justification for travel grant if requested) and a supporting letter from a supervisor with "Qlife Epigenetics Course 2023\_LASTNAME" as subject header to [qlife.events@psl.eu](mailto:qlife.events@psl.eu)

\* Fees cover food and lodging from Monday morning to Friday afternoon. Some travel grants will be available.

