Genomic Analysis in Neuroscience (GAIN 2026)

Course Overview

This course provides an introduction to the analysis of high-throughput genomic data in neuroscience. Participants will gain practical experience in the design, processing, analysis, and interpretation of bulk and single-cell sequencing datasets, with a particular focus on transcriptomic and epigenomic approaches. Through a combination of lectures, interactive discussions, and hands-on computational sessions, attendees will learn key bioinformatics concepts and apply statistical methods using widely adopted analysis tools and workflows.

This course will cover the following topics:

- Bulk transcriptomics (RNA-seq)
- Epigenomic profiling (ATAC-seq, CUT&Tag)
- Chromatin architecture and gene regulation (4C, Hi-C, HiChIP)
- Single-cell genomics (scRNA-seq, scATAC-seq, Multiome)
- Spatial transcriptomics (sequencing-based and imaging-based approaches)

The course is intended for PhD students interested in applying high-throughput sequencing and single-cell technologies to neuroscience research.

GAIN 2026 is a training activity organized within the UMH PhD Program in Neuroscience at the Instituto de Neurociencias (IN, UMH-CSIC) (Coordinator: Cruz Morenilla): https://in.umh-csic.es/en/formation/programa-de-doctorado-en-neurociencias-2/

Course Director:
Jose P López-Atalaya

Guest Lecturers:
Ana B. Muñoz Manchado – Univ. Cádiz, Cádiz, Spain
Raúl F. Pérez – Univ. Complutense, Madrid, Spain
Juan R. Tejedor – CINN, CSIC, El Entrego, Spain

Keynote Lecture:
Angel Barco

Course Lecturers:
Rafael Alcalá Vida
Violeta Durán Laforet
José P. López-Atalaya
José V. Sánchez Mut

jose.lopezatalaya@csic.es
jose.lopez@umh.es
in.umh-csic.es/en/
Tel: +34 96 523 3744
Av. Ramón y Cajal s/n
Campus de San Juan
03550 SAN JUAN DE ALICANTE– ESPAÑA

Expert Instructors
Carmen Escolar (Bioinformatics facility IN)
Marina Guillot (J.P. López-Atalaya lab)
Lara López (V. Borrell lab)
Roser Montañana (S. Jurado lab)
Nitin Narwade (A. Nieto lab)
Sergio Niñerola (A. Barco lab)
Lorenzo Puche (G. López-Bendito lab)

Systems administrator
Angel Márquez (IN, UMH-CSIC)

Dates and schedule
The course will take place from October 19 – 23, 2026.

Venue
Instituto de Neurociencias, Universidad Miguel Hernández - Consejo Superior de Investigaciones Científicas, Avenida Santiago Ramon Y Cajal, S/N, 03550, Sant Joan d'Alacant, Alicante, Spain.

Registration
The course is limited to 20 participants.

Local students: Register before July 15, 2026, by writing a mail to gaincourse2026@gmail.com (with your PhD supervisor in copy) and stating "GAIN2026" as subject.

International students: FENS (https://www.fens.org) and IBRO-PERC (https://ibro.org) provide stipends of up to 750 EUR for Master and/or PhD students located in Europe interested in attending this course. Through these stipends FENS and IBRO-PERC aim to encourage and promote international experience of students; hence, students that are currently residing or studying in Portugal are not eligible for a FENS and IBRO-PERC stipend for this course. Apply for GAIN 2026 (deadline July 15, 2026): https://fens.jotform.com/260571016349354

jose.lopezatalaya@csic.es
jose.lopez@umh.es
in.umh-csic.es
Tel: +34 96 523 3744
Av. Ramón y Cajal s/n
Campus de San Juan
03550 SAN JUAN DE ALICANTE– ESPAÑA

Programme

	Monday	Tuesday	Wednesday	Thursday	Friday
9:00-10.00	**Guest lecture** Ana B. Muñoz Manchado	**Lecture** Jose P Lopez-Atalaya	**Lecture** Jose V Sanchez-Mut	**Guest lecture** Juan R Tejedor	**Keynote lecture** Angel Barco
10:00-10:30h	break				
10:30h-11:30h	**Guest lecture** Raúl F. Pérez	**Lecture** Rafael Alcala Vida	**Expert talk** Lorenzo Puche - Marina Guillot *Single-cell transcriptomics and epigenomics*	**Expert talk** Lara López - Roser Montañana *Sequencing-based spatial transcriptomics*	**Lecture** Violeta Duran
11:30h-11:40h	break				
11:40-12:40h	**Expert talk** Carmen Gómez-Escolar *Bulk transcriptomics and epigenomics*	**Expert talk** Sergio Niñerola *3D chromatin architecture and gene regulation*	**Hands-on session** Marina Guillot - Lorenzo Puche	**Hands-on session** Lara López - Roser Montañana	**Expert talk** Nitin Narwade *Imaging-based spatial transcriptomics*
12:40-13:30h	**Hands-on session** Carmen Gómez-Escolar	**Hands-on session** Sergio Niñerola			**Hands-on session** Nitin Narwade
13:30h-14:30h	break - lunch -				
14:45h-17:00h	**Hands-on session** Carmen Gómez-Escolar	**Hands-on session** Sergio Niñerola	**Hands-on session** Marina Guillot - Lorenzo Puche	**Hands-on session** Lara López - Roser Montañana	**Hands-on session** Nitin Narwade

Hands-on topic	Bulk transcriptomics and epigenomics	3D chromatin architecture and gene regulation	Single-cell genomics	Sequencing-based Spatial Transcriptomics	Imaging-based Spatial Transcriptomics
Methods	RNA-seq, ATAC-seq, ChIP-seq, CUT&Tag	4C, Hi-C, HiChip	scRNAseq, scATACseq, scMultiome	Visium, Seeker, Treeker	MERFISH, Xenium

jose.lopezatalaya@csic.es
jose.lopez@umh.es
in.umh-csic.es

Tel: +34 96 523 3744

Av. Ramón y Cajal s/n
Campus de San Juan
03550 SAN JUAN DE ALICANTE– ESPAÑA