MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES

UIMP Universidad Internacional Menéndez Pelayo

Organized in collaboration with CSIC Consejo Superior de Investigaciones Científicas

XII UIMP Summer School on Synthetic Biology[1]

Condensates as Organizing Frameworks of Natural and Synthetic Cells

24-28 August 2026. Palacio de la Magdalena, Santander (Spain)

Directors
Prof. Germán Rivas Caballero. CIB Margarita Salas, CSIC. Madrid
Prof. Rafael Giraldo Suárez. CNB, CSIC. Madrid
Secretary
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Life is built on the dynamic organization of interacting molecular networks. In recent years, biomolecular condensates—membrane-less compartments formed by phase separation—have transformed our understanding of how cells create order, regulate complexity, and adapt to change. These self-organizing structures challenge classical views of cellular architecture and offer a new physical and conceptual framework for biology.

This year's Summer School explores biomolecular condensates as a **bridge between natural cellular organization and the design of synthetic and minimal cells**. From the physics of phase separation to the engineering of programmable cellular compartments, the school will highlight how emergent organization can be understood, controlled, and ultimately built. Bringing together ideas from biology, physics, chemistry, and engineering, the XII Summer School invites graduate students and junior fellows with these multidisciplinary backgrounds to engage with one of the most transformative concepts shaping the future of **synthetic biology and cell engineering**.

MORE INFORMATION

- **Website:** www.uimp.es
- **Registration:** 13 April 2026 – 20 August 2026
- **Registration fee:** 157,5 €
- **Fellowships applications** (*)**:** 13 April 2026 - 04 May 2026
  https://wapps001.uimp.es/e-solicitud/index.php

(*) Traveling and accommodation bursaries

HOW TO APPLY

- **Website:** https://www.uimp.es/agenda-link.html?id_actividad=66AF&anyaca=2026-27
- **Emails:** alumnos@uimp.es

CONTACT US

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[1] The **UIMP Summer Courses**, with more than **90 years of history**, are a well-established cultural and scientific reference, internationally recognized for bringing together leading experts and fostering interdisciplinary exchange. Within this tradition, the **Summer School on Synthetic Biology** has, in its eleven previous editions, addressed cutting-edge topics such as sustainable biofactories, synthetic cells, and biological engineering as a transformative technology. The **faculty**, composed of distinguished Spanish and international researchers, stands out for its scientific excellence, while its **students** are consistently recognized for their high level of commitment, motivation, and intellectual brilliance. Together, they create an exceptional environment for advanced training, discussion, and the exchange of ideas at the forefront of synthetic biology.

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PROGRAM (version 26.04.2026)

DAY 1 – Monday, 24 August 2026

Morning session

Welcoming and Introductory Remarks: Germán RIVAS

BIOMOLECULAR CONDENSATES: WHERE PHYSICS AND CHEMISTRY MEET CELL BIOLOGY

- María Luisa ROMERO-ROMERO (IQAC-CSIC, Barcelona): **Impact of biomolecular condensates in prebiotic evolution**
- Jorge R. ESPINOSA (UCM): **From droplets to structures: Multiscale simulations of phase transitions in biomolecular condensates**

Afternoon session

Round table 1: Colloquium with students, etc.

DAY 2 – Tuesday, 25 August 2026

Morning session

BIOMOLECULAR CONDENSATES IN BACTERIA: MECHANISMS AND FUNCTIONS

- Silvia ZORRILLA (CIB Margarita Salas, Madrid): **Bacterial biomolecular condensates in synthetic cell research**
- Laura CORRALES (IBVF-CSIC/Univ. Sevilla, Sevilla): **Biomolecular condensates in cyanobacteria to produce biodegradable bioplastics**

Afternoon session

Workshop 1: Raúl FERNÁNDEZ (IBBTEC – UNICAN/CSIC, Santander). **Enabling tools – Microfluidics in Synthetic Biology**

DAY 3 – Wednesday, 26 August 2026

Morning session

PHASE SEPARATION AND AMYLOID FORMATION: THE ROLE OF BIOMOLECULAR CONDENSATES

- Salvador VENTURA (UAB & I3PT-CERCA, Barcelona): **Biomolecular condensates and amyloid formation: confusion of the kinds?**
- Rafael GIRALDO (CNB-CSIC, Madrid): **Bacterial amyloids and condensates**

Afternoon session

Round table 2: Preparing the next generation of synthetic cell engineers – CSIC-UIMP Master SYNBIO and COFUND SYNBIO-CSIC Doctoral Network. Germán RIVAS.

DAY 4 – Thursday, 27 August 2026

Morning session

BIOMOLECULAR CONDENSATES IN EUKARYOTES: MECHANISMS AND FUNCTIONS

- Dolores PÉREZ-SALA (CIB Margarita Salas, CSIC, Madrid): **Condensates as functional organizers of intermediate filaments.**
- Xavier SALVATELLA (IRB, Barcelona): **Harnessing biomolecular condensation for drug discovery**

Afternoon session

Workshop 2: Raúl FERNÁNDEZ (IBBTEC – UNICAN/CSIC, Santander). **ML and AI tools in systems and synthetic biology**

DAY 5 – Friday, 28 August 2026

Morning session

KEYNOTE CLOSING LECTURE I: Evan SPRUIJT (Radboud University, Institute for Molecules and Materials, Nijmegen, NL): **Functional compartments in synthetic cells: Coacervates as models for cellular organization and the origin of life**

KEYNOTE CLOSING LECTURE II: TBA

Round table 3: Biomolecular condensates research in Europe – current status and future perspectives.