

# Frontiers of Integrative Synthetic Biology Research I

**MASTER'S DEGREE IN INTEGRATIVE SYNTHETIC BIOLOGY**

***UNIVERSIDAD INTERNACIONAL MENÉNDEZ PELAYO***

This document can be used as reference documentation of this subject for the application for recognition of credits in other study programmes. For its full effect, it should be stamped by UIMP Student's Office.



## GENERAL DATA

### Name

Frontiers of Integrative Synthetic Biology Research I

### Code

102626

### Academic year

2024-25

### Degree

[MASTER'S DEGREE IN INTEGRATIVE SYNTHETIC BIOLOGY](#)

### ECTS Credits

15

### Type

MANDATORY

### Duration

Cuatrimestral

### Language

# COMPETENCES

## General competences

CG2 - Critically approach the topics covered in Integrative Synthetic Biology.

CG3 - Contribute to developing new ideas (models or hypotheses, strategies, methodologies or combinations thereof) in the field of Integrative Synthetic Biology.

CG4 - Communicate with colleagues in the field of Integrative Synthetic Biology to pass on knowledge about molecular and cell aspects of synthetic biology and their applications in environmental and biomedical fields.

CG5 - Understand the impact of scientific and methodological advances in generating knowledge and developing new technologies with applications for improving health and the environment.

## Transversal competences

CT1 - Prepare, write and publicly defend scientific and technical reports.

CT2 - Work in multidisciplinary teams.

CT4 - Boost motivation for scientific research.

## Specific competences

CE1 - Analyse the structural features of biological macromolecules and their interactions to give rise to functionally active complexes.

CE2 - Apply chemical and biological approaches to molecular recognition studies and developing drugs.

CE3 - Typify minimal natural and synthetic systems to improve our knowledge about the fundamental principles of biological function that will be the basis for new bio/nano-technology and biomedicine applications.

CE4 - Develop a comprehensive overview of the advances in fundamental molecular and cell biology research, and its applications in biomedicine and/or the environment.

# LEARNING PLAN

## Training activities

Training activity	Hours*	% On site
TA1.- Master classes	40	100
TA2.- Practical classes	80	100
TA3.- Tutorials	80	100
TA4.- Individual and group work	40	100
TA6.- Individual student work	510	0
<b>TOTAL</b>	<b>750</b>	

## Teaching methods

M1 Master classes

M2 Practical classes and Seminars

M3 Tutorials

# EVALUATION

## Evaluation system

Evaluation systems	Minimum rate	Maximum rate
E1 Exams	45	65
E2 Evaluation of individual work	15	35
E3 Evaluation of practices and seminars	15	35
E4 Evaluation of attendance and participation	5	25

## FACULTY

### Coordinator/s

**Peretó Magraner, Juli**

*Doctor en Química*

*Catedrático de Universidad, Bioquímica y Biología Molecular (UV)*

*Instituto de Biología Integrativa de Sistema I2SysBio (UV- CSIC)*

**Peñalva Soto, Miguel Ángel**

*Profesor de Investigación*

*Centro de Investigaciones Biológicas (CIB)*

*Consejo Superior de Investigaciones Biológicas (CSIC)*

**Rivas Caballero, Germán Alejandro**

*Profesor de Investigación de OPI*

*Centro de Investigaciones Biológicas Margarita Salas (CIB-CSIC)*

### Lecturers

**Siddharth , Deshpande**

*Assistant PROFESSOR*

*Principal investigator*

*Laboratory of Physical Chemistry and Soft Matter, Wageningen University*

**Ríos Solís, Leonardo**

*Associate Professor of Metabolic and Bioprocess Engineering*

*University College London, Department of Biochemical Engineering*

**Danelon , Christophe**

*Associate Professor*

*Delft University of Technology*

**García Martínez, Javier**

*Catedrático de Química Inorgánica  
Presidente, Academia Joven de España  
Universidad de Alicante*

**Jiménez Dalmaroni, Maximiliano Javier**

*D. Phil  
Biochemistry Visiting Scientist  
National University of La Plata (UNLP)  
Institute of Biochemistry Research of La Plata (INIBIOLP)  
Faculty of Medical Sciences*

**Santala , Suvi**

*Dr Sci (Tech)  
Academy Research Fellow (Molecular and metabolic engineering)  
Tampere University*

**Jiménez Zarco, José Ignacio**

*Dr.  
Reader in Synthetic Biology.  
Imperial College London.*

**Moon , Tae Seok**

*Full Professor  
full Professor of Synthetic Biology  
J. Craig Venter Institute*

**Montoliu José, Lluís**

*Licenciado (1986) y Doctor (1990) en Ciencias Biológicas por la Universidad de Barcelona  
Investigador Científico del CSIC  
Centro Nacional de Biotecnología (CNB-CSIC)*

**Schwille , Petra**

*Max Planck Inst. Biochemistry, Martinsried, Germany)*

**Nikel Mayer, Pablo Iván**

*PhD.*

*Full Professor/ Head of Section*

*Denmark Technical University*

**Seeberger , Peter**

*Professor*

*Director Max Planck Institute for Colloids and Interfaces, Potsdam, Germany*

**Becker , Anke**

*Professor*

*Chair Dept. Microbiology*

*University of Marburg*

**Ledesma Amaro, Rodrigo**

*Reader*

*Metabolic Engineering*

*Imperial College London*



## SCHEDULE

### Timetable

04/10/2024

11:00 - 12:00

OPENING LECTURE: New synthetic biology tools for metabolic control

Rodrigo Ledesma Amaro

Reader  
Metabolic Engineering  
Imperial College London

25/10/2024

11:00 - 12:30

MISB FRONTIERS: Engineering genomically minimal cells for integrative physiological studies

James Pelletier

CNB-CSIC, Madrid

07/11/2024

15:00 - 16:30

MISB FRONTIERS: DNA nanotechnology and DNA origami for synthetic cells

Kerstin Göpfrich

Doctor  
Research Group Leader  
Max Planck Institute for Medical Research, Heidelberg

15/11/2024

11:00 - 12:30

MISB FRONTIERS: Constructing minimal cells that can evolve

Christophe Danelon

Associate Professor  
Delft University of Technology

22/11/2024

11:00 - 12:30

MISB FRONTIERS: Using Nature's Building Blocks for Next-Gen Bioinspired Tech: Cellular Bionics

Yuval Elani

PhD - Chemical Biology, Imperial College London  
Lecturer - Chemical Engineering Department  
Imperial College London

06/02/2025

11:00 - 12:30

MISB FRONTIERS

Tae Seok Moon

Full Professor  
full Professor of Synthetic Biology  
J. Craig Venter Institute

17/02/2025

11:00 - 12:30

MISB FRONTIERS: Microfluidics & engineered bio membranes in synthetic cell design

Anke Becker

Professor  
Chair Dept. Microbiology  
University of Marburg

21/02/2025

11:00 - 12:30

MISB FRONTIERS: Microfluidics & engineered bio membranes in synthetic cell design

Thomas Ellis

PhD in Pharmacology, University of Cambridge  
Professor of Synthetic Genome Engineering  
Imperial College Centre for Synthetic Biology (IC-CSynB) and the Department of Bioengineering  
at Imperial College, London

03/03/2025

11:00 - 12:30

MISB FRONTIERS: Microfluidics & engineered bio membranes in synthetic cell design

José Ignacio Jiménez Zarco

Dr.  
Reader in Synthetic Biology.  
Imperial College London.

22/05/2025

11:00 - 13:00

MISB FRONTIERS: What's in a condensate: Centromeres, Kinetochores, and the Likes

Andrea Musacchio

Max Planck Institute of Molecular Physiology, Dortmund (Germany)

27/05/2025

12:00 - 13:30

MISB FRONTIERS: Using Nature's Building Blocks for Next-Gen Bioinspired Tech: Cellular Bionics

Elena Conti

Profesor Dr.

Max Planck Institute of Biochemistry / Department of Structural Cell Biology

27/06/2025

12:30 - 14:00

MISB FRONTIERS

María Suárez Díez

Catedrático y director de departamento (Full professor and chair Systems and Synthetic Biology)  
Wageningen University