



PhD in Synthetic Biology

What: A full-time 4-year PhD contract to engineer synthetic gene circuits

Where: University Pompeu Fabra, Barcelona, Spain

When: Deadline: 26th Oct 2025 or until filled – Start: 1st Jan 2026 or when agreed

Description:

The emerging ‘Synthetic Cell Programming’ lab, led by Dr. Santos-Moreno (santosmorenolab.org), is seeking for a highly-motivated PhD candidate for engineering **synthetic gene circuits to program temporal tasks** in *E. coli* cells. This position is funded by an ERC Starting Grant (project: TICK-TOCK Do and Die).

Past achievements of Dr. Santos-Moreno include tool development for synthetic biology, such as CRISPRi-based circuits ([Santos-Moreno et al. 2020, Nat Commun](#)) or modular cloning approaches ([Santos-Moreno & Schaerli 2019, ACS Synth Biol](#)); the use of those tools to address longstanding biological questions, related to evolution ([Santos-Moreno et al. 2023, Nat Commun](#)) or pathogenesis ([Rueff et al. 2023, Nat Commun](#)); and the engineering of diverse members of the human microbiome – including gut (*E. coli*), lung (*S. pneumoniae*, in collaboration) and skin (*C. acnes*) microbes – for basic or applied research, such as the delivery of molecules with anti-acne and anti-oxidant potential by an engineered skin bacterium ([Knödseder et al. 2024, Nat Biotechnol](#)) ([Nevot et al. 2025, Cell Systems](#)).

The group is part of the Medicine and Life Sciences ([MELIS](#)) department at the University Pompeu Fabra (UPF), a high-class institution with demonstrated competitiveness. The lab is physically located at the Biomedical Research Park of Barcelona ([PRBB](#)), a multidisciplinary bio-hub with state-of-the-art facilities hosting top-class research institutes, including the Center for Genomic Regulation (CRG), and the European Molecular Biology Laboratory (EMBL), among others. You will benefit from a stimulating and international research environment in a young and dynamic team. The host group is committed to maintaining a respectful, inclusive, and friendly working environment for all staff and students, as well as promoting personal and career development.



Your role:

You will work on designing and building synthetic gene circuits to program temporal tasks in *E. coli* cells, using CRISPRi, transcription factors, and other molecular tools. Following the *in silico* design, you will construct the circuits using advanced cloning techniques and you will evaluate their performance using microplate reader measurements, flow cytometry and fluorescence microscopy, among other techniques. After building and characterizing prototype circuits, you will fine-tune them and connect them to other circuits / actuator modules.

You are also expected to write articles, present results at seminars / conferences, contribute to the training of undergraduate students, collaborate with other group members and labs, and apply for PhD fellowships. If interested, you can also participate in teaching and outreach activities.

Requirements:

- 1) A BSc or MSc in Biology, Biotechnology, Bioengineering, or a related discipline
- 2) Excellent track-record of BSc and MSc degrees is highly valued (average > 8/10)
- 3) Experience:
 - *Essential*: expertise in at least one of the following: synthetic biology, molecular biology, microbiology, bioengineering
 - *Highly desirable*: experience in designing gene circuits or in modelling them
 - *Desirable*: experience in NGS (e.g. Illumina, Nanopore,...) sequencing (sample prep and data analysis), base editing, synthetic memory, biocontainment, bioproduction, or microfluidics
- 3) Competencies & skills:
 - High motivation and proactivity
 - Ability to work independently and as part of a team
 - Strong organizational skills
 - Scientific integrity and rigor
 - A good command (spoken & written) of English language

What we offer:

- A full-time PhD contract for 4 years
- Competitive salary
- 36 days/year of paid holidays: 22 days of personal choice + 14 bank holidays
- Full access to the Spanish national social security, including free-of-charge access to the health system and unemployment and retirement contributions
- Measures to reconcile work & family life, including parental leave and flexible working hours
- Mentorship and training, including access to free courses and resources, to accelerate your professional development



How to apply:

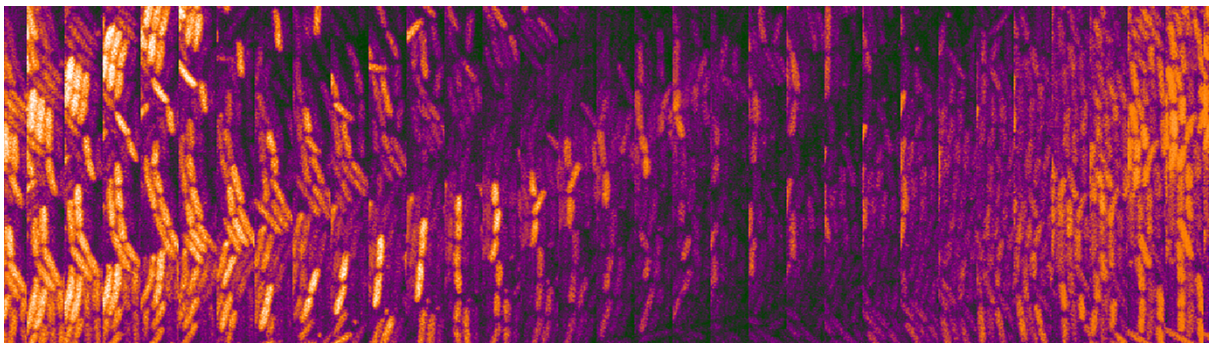
Please send your application to javier.santos@upf.edu with 'PhD timers 2025' as the subject line. Provide your ID/Passport number in the body of the email, and include all of the following in a single PDF document named as 'PhD-timers_yourName_yourSurname.pdf':

- 1) Motivation letter
- 2) CV
- 3) Contact details of 2 references

Questions?

Please contact Javier Santos-Moreno (javier.santos@upf.edu) for inquiries.

Apply now!



E. coli cells displaying a temporal behaviour controlled by a synthetic gene circuit