

Research Studentships (for students of a course that does not award an academic degree)

Applications are open for one Research Studentship(s), within the framework of “A Gold Nanosensor for Single-Molecule Detection of RNA Biomarkers in a Miniaturized Microscope” / CQE, IST-ID, Ref. 2022.04076.PTDC, financed by national funds through FCT/MCTES (PIDDAC).

Scientific Area: Biomaterials, Nanotechnology and Regenerative Medicine

Admission Requirements:

a) to hold a bachelor or master degree and be enrolled at a course that does not award an academic degree and it is integrated in the educational project of a higher education institution, performed in association or cooperation with one or several R&D units;

b) not to exceed with this contract, including the possible renovations, an accumulated period of two years in this type of studentship, continuously or with interruptions.

Workplan: The DNA origami technique enables the nanofabrication of supramolecular structures with unprecedented control and programmability. In the work plan, the hired researcher will prepare and characterize DNA origami nanostructures using inhouse developed methods of DNA scaffold production and purification. The origamis will be redesigned to assemble hybrid nanostructures from metal nanoparticles, thus imparting programmable optical properties. The hybrid nanostructures will be characterized by electron and optical microscopies with single object sensitivity.

The detailed objectives are:

- 1) The production of scaffolds by asymmetric PCR using the M13 phage genome as template and appropriate primers, whereas staple sequences will be redesigned and purchased from specialty companies.
- 2) Assembly of scaffold and staple strands by thermal annealing under high magnesium concentrations, and purification by ultrafiltration.
- 3) Structural characterization of DNA origamis by electron microscopy or, alternatively, by optical spectroscopy (FCS/FRET or FLIM/FRET) using dual labeling schemes with a donor/acceptor pair.
- 4) Assembly of metal nanoparticles functionalized with complementary oligo sequences to produce hybrid nanostructures that will be characterized by optical spectroscopy and electron microscopy.

Legislation and Regulations: Statute of Scientific Research Fellow, approved by Law nr. 40/2004, of August 18, as worded by Decree-Law nr. 123/2019, of August 28; FCT Regulation for Research Studentships and Fellowships, available on <https://www.fct.pt/apoios/bolsas/docs/RegulamentoBolsasFCT2019.pdf> and <https://dre.pt/application/file/a/127230968>.

Workplace: The work will be developed at Institute for Bioengineering and Biosciences and Centro de Química Estrutural of Instituto Superior Técnico, under the scientific supervision of Professor Duarte Miguel Prazeres and Doctor Pedro Paulo.

Duration: The research fellowship will have the duration of 6 months. It's expected to begin in July 2024 and may be eventually renewed up to the maximum of 12 months, including the duration of the initial contract.

Monthly maintenance allowance: According to the values for Research Fellowships awarded by FCT in Portugal (https://www.fct.pt/wp-content/uploads/2024/02/Tabela-de-Valores-SMM_atualizacao-2024.pdf), the amount



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of the monthly maintenance allowance is € 1259,64, being the payment method an option of the Fellow by Wire Transfer/Check.

Selection methods: The selection methods will be the following: (A) *Curriculum evaluation*, (B) *Motivation letter* and (C) *Individual interview (optional)*, with the respective weight of: (A) 75% + (B) 25% (if no interviews are conducted) or (A) 45% + (B) 15% + (C) 40% (if applicants are interviewed).

Composition of the selection Jury: Doctor Pedro Miguel Neves Ribeiro Paulo (President), Doctor Duarte Miguel de França Teixeira dos Prazeres (Vogal), and Doctor Gabriel Monteiro (Vogal).

Announcement/ notification of the results: The final evaluation results will be communicated to all applicants by email.

Deadlines and procedures of complaint and appeal. A complaint may be lodged from the final decision within 15 working days, or an appeal to the Executive Board of IST-ID within 30 working days, both counted from the respective notification

Application deadline and formalization: The call is open from 19 until July 2, 2024.

It is mandatory to formalize applications with the submission of the following documents: i) B1 Form – Fellowship application (<https://ist-id.pt/concursos/bolsas/>); ii) *Curriculum Vitae*; iii) academic degree certificate, where applicable; iv) motivation letter; v) declaration on honour that the applicant does not exceed with this contract an accumulated period of two years in this type of studentship, continuously or with interruptions.

Applications must be submitted to the email: pedro.m.paulo@tecnico.ulisboa.pt



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