

IST/2026/BL89

Research Scholarship of Post-Doctoral Research for the scientific area of Chemical engineering

Scientific Advisor: Ana Clara Lopes Marques (ist45873)

Organic Unit: Department of Chemical Engineering

Scholarship Theme: Post-Doctoral Research Fellowship, within the framework of BioMembrOS (Biomimetic Membranes for Organ Support)/Center of Physics and Engineering of Advanced Materials (CeFEMA), 101130006, financed by European Funds through HORIZON-EIC-2023-PATHFINDEROPEN-01

Duration: 12 months

Maximum Duration Including Renewals: 12 months

Monthly Maintenance Allowance: €1,851.00

Funding Entity: Instituto Superior Técnico (IST)

Objectives

- Develop hemocompatible hybrid and composite membranes for gas permeation.
- Integrate Metal–Organic Frameworks (MOFs) to enhance oxygen and carbon dioxide permeability and selectivity.
- Design hemocompatible coating strategies to improve membrane–blood interactions.
- Model and optimize membrane performance using computational tools, machine learning, and artificial intelligence

Work Plan

- Synthesis and characterization of hemocompatible hybrid and composite membranes for gas permeation.
- Synthesis and characterization of Metal Organic Framework (MOF) and understand its role on the enhancement of the permeability and selectivity of hybrid and composite polymer/MOF membranes for oxygen and carbon dioxide.
- Hemocompatible coating of membranes
- Modelling & Optimization of gas permeation of hybrid and composite membranes with recourse to parameters pertaining to membrane casting solutions composition, MOF structures, coating techniques and membrane casting procedure.
- Modeling and optimization of parameters of the system using machine learning and artificial intelligence algorithms.
- Assist the IST research team in the preparation of technical reports, presentations, and meetings, as well as the purchasing process of materials and services required for the development of the project according to plan

Admission Requirements

- a) to hold a PhD degree obtained in the 3 years previously to the submission of the fellowship application
- b) to have carried out the research work that led to the PhD degree in a different entity from the host institution of the fellowship
- c) Not to exceed, with this fellowship contract, including the possible renovations, an accumulated period of 3 years in

this type of fellowship, continuously or with interruptions
d) Not to have previously held a post-doctoral fellowship from IST.

Applicable Laws and Regulations

Law No. 40/2004, of 18 August (Statute of Scientific Research Fellow), in its current wording; FCT Regulation for Research Fellowships, available at https://drh.tecnico.ulisboa.pt/files/sites/45/despacho_8532_regulamento_bolsas.pdf.

Context, Workload and Schedule

Workplace: The work will be developed at the Membranes and Membrane Processes Laboratory of Centro de Física e Engenharia de Materiais Avançados (CeFEMA) and Adsorbent Materials Laboratory of Centro de Recursos Naturais e Ambiente (CERENA) of Instituto Superior Técnico, Universidade de Lisboa

Work Model: Not applicable.

Main Campus: Alameda

Expected Average Weekly Workload: Not applicable.

Expected Schedule for Activities and Functions: Not applicable.

Contest Evaluation Method(s)

Curricular evaluation weighted to 100% on a scale of 100 points.

Conditions for the Contest Evaluation

- a) Evidence of acquisition of Scientific maturity and independence during the PhD (eventual recommendation letter of the PhD supervisor) (50%).
- b) Adequacy of the PhD area and previous research with the scientific areas involved in the workplan (20%).
- c). Scientific Activity in the final period of PhD or post-PhD (scientific publications and communications, projects (15%).
- d) Communication skills (15%).

In addition to the above-referenced requirements, candidates for the research grant must have a PhD in the scientific area of Chemical Engineering, Chemistry, Materials Engineering, Biomedical Engineering, or related areas.

Composition of the Selection Jury

Jury President: Moisés Luzia Gonçalves Pinto (ist416959)

Jury Members: Mónica Cristina Faria Besteiro (ist90270); Ana Clara Lopes Marques (ist45873).

In case the president of the jury is unable to preside, they will be replaced by one of the jury members.

Contest Procedure

Applications must be exclusively submitted on the [admissions platform](https://fenix.tecnico.ulisboa.pt/fenixedu-admissions) of the [Instituto Superior Técnico](https://fenix.tecnico.ulisboa.pt/fenixedu-admissions) at <https://fenix.tecnico.ulisboa.pt/fenixedu-admissions> and requires registration and validation of the candidate's identity.

Applications are only accepted when the form available in the platform is correctly filled, submitted and locked without any validation errors. The mandatory documentation to submit in the scholarship application includes:

Curriculum Vitae

Proof of Qualifications (or declaration of honor in case you do not yet have the certificate)

Proof of Registration/Enrolment

Motivation Letter

The application submission deadlines can be viewed in the admissions platform.

The results of the contest will be made available in the same admissions platform.
