

## CALL FOR AWARDING RESEARCH FELLOWSHIPS WITHIN PROJECT GRANTS AND R&D INSTITUTIONS

### 1 Research Fellowship for PhD Student

1 Research Fellowship(s) (BI) is(are) open at the **FCiências.ID – Associação para a Investigação e Desenvolvimento de Ciências**, for the project/R&D institution ElectroMagnetic imaging for a novel genERation ofmedicAL Devices — EMERALD, [Grant agreement nº 764479], financed by European Union’s H2020 research and innovation programme (H2020-MSCA-ITN), under the following conditions:

- 1. Scientific Area:** Electromagnetic imaging for a novel generation of medical devices, Biomedical Engineering and Biophysics (Engenharia Biomédica e Biofísica)
- 2. Requirements for admission:** Must have a Master degree in Biomedical Engineering. Must have participated in European projects. Must have published/presented original scientific work in peer-reviewed journals and international conferences in the area of this project (to be detailed in CV and/or motivation letter).
- 3. Additional optional skills and qualifications:** Proven knowledge in the following software: CST, Matlab and 3D slicer (to be detailed in CV and/or motivation letter).
- 4. Contracting requirements:** Presentation of the academic qualifications and/or diplomas. Enrolment in PhD Doctoral Programme in Biomedical Engineering and Biophysics in Faculdade de Ciências da Universidade de Lisboa (<https://fenix.ciencias.ulisboa.pt/degrees/engenharia-biomedica-e-biofisica-564500436615260>) is required.
- 5. Work plan:** Electromagnetic Device for Axillary Lymph Node Diagnosis. The proposed plan concerns testing our current axillary phantom to assess Axillary Lymph Node Microwave Imaging (ALN MWI). The main scientific objective of the proposed project is to advance ALN imaging and diagnosis using microwave tomography (MWT) technology. The proposed project is divided into the following main Tasks (T).
  - T.1.** Development of the setup to be used for axillary MWT. In a MWT setup, antennas are usually positioned in a circular array configuration outside the region where the object under test is enclosed. The fellow will study the best matching medium and operating frequencies for axillary MWT and will study the best scanning configuration (i.e. antenna positioning) around the axilla.
  - T.2.** Development and numerical assessment of tomographic algorithms for axillary MWI. The fellow will improve as much as possible the a-priori information of the imaging scenario. This means informing the algorithm with anatomical data such as weight, height, body mass index (BMI), or prior medical images. These details will allow the fellow to infer information about the amount of different tissues which are present in the axillary region (e.g. ratio of fat and muscle tissues). We expect that information to “smooth” the ill-posedness of the problem and to aid the convergence of our algorithm to the correct solution.
  - T.3.** Experimental testing of the implemented imaging algorithms on the signals collected while using the axillary phantom. This objective will be pursued in collaboration with Dr. Panagiotis Kosmas (King’s College London). The fellow will have to adapt the existing MWT setup to the axillary MWT application. This will mainly involve a new positioning of the antennas. The data will be acquired and processed. The fellow will assess the performance of the system in detecting ALNs with different sizes, shapes, and positions.



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T.4 The fellow will disseminate and communicate his/her results, namely one conference paper will be submitted to an international conference (e.g. European Conference on Antennas and Propagation, EuCAP 2022), and one journal paper on the imaging of the axillary region will be prepared and submitted to a high impact-factor journal.

6. **Legislation framework:** Research Fellowship Holder Statute, in accordance with Law 40/2004, of 18 August, in its current version and the FCT Regulation for Research Studentships and Fellowships, in its current version (Reg. 950/2019 published in DR on 16<sup>th</sup> December: <https://dre.pt/application/file/a/127230968>, or at the FCT website: <https://www.fct.pt/apoios/bolsas/regulamento.phtml.pt>), and FCIências.ID Fellowship Regulation, as approved on 12<sup>th</sup> May 2020 (available at [Regulamento de Bolsas de Investigação Científica da FCIências.ID](https://www.fciencias.id/regulamento-de-bolsas-de-investigacao-cientifica-da-fciencias.id)).

7. **Place of work:** The work will be developed at the Instituto de Biofísica e Engenharia Biomédica under the scientific supervision of Professor Dr. Raquel Cruz Conceição.

8. **Fellowship duration:** This position is initially opened for 3 months and will begin on September 2021. The fellowship contract may be potentially renewed for a maximum of 5 months until the end of the project on the 30<sup>th</sup> of April 2022 months, in accordance with the provisions of Regulation of Research Fellowships from the Foundation for Science and Technology, I.P and FCIências.ID Fellowship Regulation.

9. **Monthly allowance:** The fellowship amounts to € 1104,64 monthly, according to [table values](#) of the FCIências.ID Fellowship Regulation. The fellowship holder will have a personal accident insurance and can ensure the right to social security through adherence to the voluntary social insurance scheme, if not covered by any other social protection scheme, pursuant to *Código dos Regimes Contributivos do Sistema Previdencial de Segurança Social*. The fellowship will be paid monthly by bank transfer. Additionally, the research grant may include the costs with the incurred tuition fees.

10. **Evaluation and selection process:** Candidates will be assessed according to:  
Criterion A1 – Grade achieved in the Bachelor\* in Biomedical Engineering, percentage weight of 20%;  
Criterion A2 – Grade achieved in the Master\* in Biomedical Engineering, percentage weight of 40%;  
Criterion B - CV, with emphasis on academic experience, for example participation in European projects, scientific publications in high impact journals and proceeding of national and/or international conferences, percentage weight of 20%;  
Critério C – Motivation letter demonstrating the suitability of the candidate to the project, percentage weight of 10%;  
Critério D – Most significant document, for example Master dissertation or journal publication, and its relevance in the call, percentage weight of 10%.

Final Grade = (20%×A1) + (40%×A2) + (20%×B) + (10%×C) + (10%×D)

If there is more than one candidate with the same final grade, the candidates will be ordered based on the highest grade in criterion A, followed by criterion B, followed by criterion C and then criterion D. If required, an interview will take place. Only candidates with a final grade above 18 (graded in the scale 0-20) will be considered.

\*If the applicant has completed an Integrated Master, that grade should be used for both A1 and A2.



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**11. Selection Committee:**

President of the jury : Prof. Nuno Matela, Instituto de Biofísica e Engenharia Biomédica, Faculdade de Ciências da Universidade de Lisboa, Campo Grande, 1749-016-Lisboa;

Member of jury 1: Dr. João Miguel Pinto Coelho, Instituto de Biofísica e Engenharia Biomédica & Laboratório de Óptica, Lasers e Sistemas, Faculdade de Ciências da Universidade de Lisboa, Campo Grande, 1749-016-Lisboa;

Member of jury 2: Prof. Alexandre Andrade, Instituto de Biofísica e Engenharia Biomédica, Faculdade de Ciências da Universidade de Lisboa, Campo Grande, 1749-016 Lisboa;

Alternate member: Guiomar Evans, Laboratório de Instrumentação e Física Experimental de Partículas, Faculdade de Ciências da Universidade de Lisboa, Campo Grande, 1749-016-Lisboa

**12. Publication/notification of results:** All the candidates will be notified by e-mail, sent by the call holder, with the selection meeting minutes enclosed.

**13. Deadlines:** This call for applications is open from 23/06/2021 to 01/07/2021 .

**14. Application:** Applications should be sent via e-mail to [rconceicao@fc.ul.pt](mailto:rconceicao@fc.ul.pt), by attaching the following documents:

- a. Curriculum vitae – CV may be provided in PDF format or through the [CIÊNCIAVITAE](#) system;
- b. Certificate of completion of previous degree;
- c. Motivation letter, as per criterion C;
- d. Most significant document, as per criterion D.

**15. Time limits for the appeal procedure:** In case of negative decision, the candidates have 10 business days, after the date of announcement of the results of the candidates evaluation, to pronounce their disagreement in accordance with the *Código do Procedimento Administrativo*. Appeals against the final decision may be submitted to the Administration Board of FCIências.ID ([fciencias.id@fciencias-id.pt](mailto:fciencias.id@fciencias-id.pt)) within 15 business days after the notification date

**Note 1:** The documents that prove the entitlement of the academic qualifications and diplomas, or the proof of registration in the academic degree or diploma requested on the call, can be dismissed during the application period and replaced by a declaration on their honour from the applicant. Their delivery is mandatory during the fellowship contractualization. If not requested in the requirements for admission, the proof of registration in the academic course requested on the call is mandatory for contract signature.

**NOTE 2:** Please note that - higher education degrees and diplomas awarded by foreign higher education institutions need to be recognized by a Portuguese higher education institution, pursuant to the [Decree-Law nr. 66/2018](#) (August 16) and the [Ministerial Order nr. 33/2019](#) (January 25). The presentation of the recognition certificate is mandatory for contract signature. More information can be obtained at: <https://www.dges.gov.pt/en/pagina/degree-and-diploma-recognition>.



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