

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

### 1 Research Fellowship (BI) for a PhD Student

1 Research Fellowship(s) (BI) is open at the **FCiências.ID – Associação para a Investigação e Desenvolvimento de Ciências**, for the project/R&D institution CO<sub>2</sub> valorisation with earth abundant metals: From bench to pilot/ Instituto de Biosistemas e Ciências Integrativas (BioISI), PTDC/QUI-QIN/0252/2021, financed by national funds by FCT / MCTES (PIDDAC) under the programme Programme All Scientific Domains, under the following conditions:

1. **Scientific Area:** Chemistry
2. **Requirements for admission:** MSc in Chemistry with experience in synthesis and characterisation of coordination compounds.
3. **Additional optional skills and qualifications:** Knowledge on the following characterisation techniques: Nuclear Magnetic Resonance, Infrared Spectroscopy, UV-vis Spectroscopy, SQUID Magnetometry, Single Crystal and powder X-Ray diffraction. Experience in lab stays abroad. Attendance to national/international meeting with oral and poster communications.
4. **Contracting requirements:** Presentation of the academic qualifications and/or diplomas. Enrolment in Doctoral Programme at Faculdade de Ciências da Universidade de Lisboa.
5. **Work plan:** Molecular activation is important not only in chemical systems but also in more complex biological systems. One of the most important players in molecular activation is carbon dioxide due to its crucial role in the environment with consequences for the climate and heating the earth's surface by trapping infrared radiation in the atmosphere. Unfortunately, the expansion of human population and the energy demand resulting from there, derived in an increase of carbon dioxide concentration unbalancing the earth's carbon cycle, thus affecting the energy balance of the planet. As a result, scientists have struggled to reduce CO<sub>2</sub> into added value chemical such as carbon monoxide, formic acid, methane and methanol that can be used as fuels. Catalysis has been the most attractive approach with a recent scientific interest increase in the catalytic CO<sub>2</sub> photoreduction, as light is a sustainable electron source essential for the conversion – artificial photosynthesis. Although there have been many efforts in finding new compounds that catalyse CO<sub>2</sub>, the implementation of these systems in an industrial scale remains stagnated. This research project addresses this problem and wishes to help industries solving their huge amounts of carbon dioxide releases by transforming this gas into other with added economic value, namely methane. For that, optimisation of catalytic conditions and carbon dioxide conversion are addressed followed by scale-up implementation and pilot development. We have previously reported a metal cryptate that can capture and convert CO<sub>2</sub> into carbon monoxide and methane triggered by visible light and we now aim at transferring this catalytic system from the lab to the pilot scale.  
To achieve this goal, the research fellow has to develop the following tasks:
  1. Synthesis and optimisation of catalysts;
  2. CO<sub>2</sub> photoreduction studies: optimisation at the lab scale;
  3. Scale-up, design and construction of a pilot unit;
  4. Techno-economical assessment and scale-up studies.
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:

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

<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](#)).

7. **Place of work:** The work will be developed at the BioISI under the scientific supervision of Doctor Paulo Nuno Martinho, Doctor Sara Realista and Doctor Rui Galhano.

8. **Fellowship duration:** This position is initially opened for 12 months and will begin on February 2022. The fellowship contract may be potentially renewed for until the end of the project, in accordance with the provisions of Regulation of Research Fellowships from the Foundation for Science and Technology, I.P.

9. **Monthly allowance:** The fellowship amounts to € 1104,64 ,according to [table values](#) of the fellowships awarded directly by the FCT, IP. 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

10. **Evaluation and selection process:** Candidates will be assessed in a 1st phase of evaluation by the quality of their CV (60%) and previous experience (40%). 2nd phase of evaluation: interview the three best-ranked candidates in the previous evaluation phase (100%).

11. **Selection Committee:** President of the jury: Doctor Paulo Nuno Martinho; Members: Doctor Sara Realista and Doctor Rui Galhano; Alternate member: Doctor Nuno Bandeira.

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 14/12/21 to 27/12/2021 .

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

- Curriculum vitae - **CV may be provided in PDF or through the [CIÊNCIAVITAE](#) system;**
- Certificate of completion of previous degree;
- other documents considered relevant.

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 for the fellowship contractualization.

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

**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>.