CALL FOR GRANT APPLICATIONS
(AE2025-0280)

INESC TEC is now accepting grant applications to award 1 Post Doctoral Research Grant (BIPD) within the scope of the within the OmicBots project with reference PTDC/ASP-HOR/1338/2021, Funded by National Funds through the FCT - Foundation for Science and Technology, I.P.

1. GRANT DESCRIPTION

Type of grant: Post Doctoral Research Grant (BIPD)

General scientific area: ENGINEERING

Scientific subarea: Precision engineering

Area of Work: Precision Agriculture, bioinformatics, System Biology, Genome Scale Model, Plant physiology, Molecular biology

Grant duration: 5 months 5 days, starting on 2025-08-11.

Scientific advisor: Mário Cunha

Workplace: INESC TEC, Porto, Portugal

Maintenance stipend: € 1851.00, according to the table of monthly maintenance stipend for FCT grants , paid via bank transfer. Grant holders may be awarded potential supplements, according to a quarterly evaluation process (Articles 19, 21 and 22 of the Regulations for Grants of INESC TEC and Annex II), up to a maximum limit of 50% of the monthly maintenance stipend.

INESC TEC supports costs with registration, enrolment or tuition fees, during the grant duration, under the terms established in the internal document: "Payment of Tuition fees to grant holders".

The grant holder will benefit from health insurance, supported by INESC TEC.

2. OBJECTIVES:

Integration of biophysical sensor data, multi-omics in systems biology (SB), where the metabolic pathways of the grapevine can be explored to understand the impact of genetic, environmental, and cultural practices on vine physiology/metabolism for the development of advanced precision agriculture models.
The candidate's activities will be developed within the scope of the project: OmicBots – High-Throughput Integrative Biology Omics Robots Platform for 'Next Generation Plant Physiology based Precision Viticulture' https://www.fc.up.pt/omicbots/Home.html Integrating data from optical sensors and multi-omics in systems biology (SB), where the metabolic pathways of the grapevine can be explored to understand the impact of genetic, environmental, and cultural practices on vine physiology/metabolism for the development of advanced precision agriculture models.
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https://www.fc.up.pt/omicbots/Home.html

3. BRIEF PRESENTATION OF THE WORK PROGRAMME AND TRAINING:

- Rever o estado da arte, desenvolver benchmark e desenvolver a prova de conceito sobre modelos avançados de agricultura de precisão baseados na integração de dados espectrais, multiomicas e biologia de sistemas (SB).
- Caracterizar respostas fisiológicas, metabólicas e transcricionais de videiras em estufa/campo em resposta a stress abióticos para validar dados espectrais de campo.
- Desenvolver uma abordagem de BS para mapear as vias metabólicas da videira e inferir o seu fenótipo/estado

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fisiológico;
- Explorar métodos computacionais e modelos metabólicos em escala genómica para otimizar o espaço fenotípico/funcional através de diagnósticos mecanísticos e simulações.
- Desenvolver uma plataforma baseada em inteligência artificial que integre BS e dados espectrais em tempo real para promover a viticultura de precisão avançada.
- Participar nas atividades laboratoriais e de campo (horário flexível) a decorrer no âmbito do projeto.
- Teste e validação das soluções desenhadas em contexto real, e publicação dos resultados.
- Pretende-se ainda que o investigador participe nas seguintes atividades: co/supervisionar estudantes PhD e MSc; desenvolver e escrever artigos científicos (percentil Q1); contribuir ativamente com os seus desenvolvimentos para concursos competitivos de projetos na linha de investigação. - Review state of the art, develop benchmarks, and create a proof of concept for advanced precision agriculture models based on integrating spectral data, multi-omics, and systems biology (SB).
- Characterize grapevine physiological, metabolic, and transcriptional responses to abiotic stress, validating field/greenhouse spectral data.
- Develop a SB approach to map metabolic pathways of the grapevine and infer a virtual grapevine phenotype/physiological feature space model.
- Explore computational methods and genome-scale metabolic models to apply to optimize phenotype/physiological space through mechanistic diagnosis and simulations
- Develop an AI-driven platform that fuses SB and real-time field spectral data to advance precision viticulture.
- Participate in laboratory and field activities (flexible schedule) within the project scope.
- Test and validate the designed solutions in a real-world context and publish the results.
- The researcher is also expected to participate in the following activities: co/supervise PhD and MSc students; develop and write scientific articles (Q1 percentile); actively contribute their developments to competitive project contests in the research line.

4. REQUIRED PROFILE:

Admission requirements:
PhD in Agricultural Sciences, Bioengineering, Biochemistry, Biology, BioInformatics/BS, Bitechnological Engineering and related areas.
The PhD degree must have been obtained within the three years prior to the date of submission of the application and the research work leading to the award must have been carried out at a host entity other than INESC TEC.

Preference factors:
Proven experience in Systems Biology and Bioinformatics, Plant Physiology, Molecular Biology, Biochemistry
The jury may not award the scholarship if the quality of the candidates is lower than desired.

Minimum requirements:
- Precision and digital agriculture; Plant physiology; Biochemistry
- BS: 'genotype-scale metabolic models'
- AI-based predictive models.
- Computational: R (Bioconductor), MATLAB (computational biology), Python (e.g. pyCOBRA, pyMEW) and Bioformatics for database searching.
- Multiomics integration (e.g. HPLC, GCMS).

5. EVALUATION OF APPLICATIONS AND SELECTION PROCESS:

Selection criteria and corresponding valuation: the first phase comprises the Academic Evaluation (AC), based on the criteria referred to in Article 12 of the Regulations for Grants of INESC TEC, while the second phase comprehends the Individual Interview (EI). All factors are evaluated on a scale of 0 to 100, taking into account the applicants' merit, suitability and conformity with the preference factors.
The weight of the AC factors are as follows: Academic Qualifications (FA, 40%), Scientific Publications (PC, 25%), Experience (EX, 25%) and Motivation Letter (CM, 10%).
Candidates who score less than 50 points in the AC average will be considered excluded on absolute merit. The top five candidates approved on absolute merit will be qualified for the individual interview. The Final Grade (CF) is obtained by the weighted average of AC (90%) and EI (10%).

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DISABILITY INCENTIVE

Candidates who present a degree of disability equal to or greater than 90% will benefit from an incentive (20) in the score of the CV Assessment.

Candidates who present a degree of disability equal to or greater than 60% and less than 90% will also benefit from an incentive (10) in the score of the CV Assessment.

Said score may, in these cases, exceed 100 points.

Candidates must demonstrate the degree of disability during the application, namely through the submission of the Multi-Purpose Medical Certificate of Disability, issued in accordance with Decree-Law no. 202/96, of October 23 - currently in effect.

Candidates must declare, in the application form, the type of disability used throughout the selection process, in order to proceed with the required adaptations.

The Selection Jury is composed of the following members:
President of the Jury: Mário Cunha
Full member: Filipe Neves Santos
Full member: Renan Tosin
Substitute member:

Release of results and prior hearing: the results of the selection process, as well as the terms and procedures for prior hearing, will be released to the applicants by email, under the terms referred to in Article 13 of the Regulations for Studentships and Fellowships of INESC TEC.

6. FORMALISATION OF APPLICATIONS:

Application Documents:

1. Motivation letter;
2. Curriculum Vitae (must include the list of previous fellowships, their type, beginning and end dates, funding entities and host institutions);
3. Certificate or diploma degree;
4. Documental evidence to support the country of residence, residence permit or other legally equivalent document, in cases where the applicant is a foreigner or non-resident in Portugal - valid until the beginning of the grant.
5. Other supporting documents relevant to the final assessment.

Failure to deliver the required documents within the 90-day period after the date of the notice of the conditional awarding of the grant implies its cancellation.
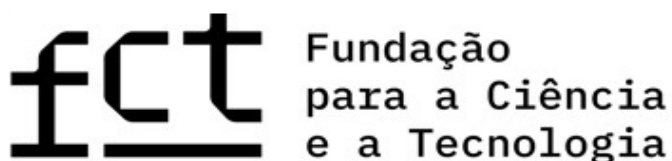
Application period: From 2025-07-10 to 2025-07-23

Submission of applications: the application will be formalised by submitting the form available in the *Work With Us* section of INESC TEC website.

7. BINDING LEGISLATION AND REGULATION

The hiring process shall comply with the current legislation regarding the Research Grant Holder Statute, approved by Law no. 40/2004 of August 18, in its current wording, as well as by the Regulations for Grants of INESC TEC and for FCT Grants Regulation in force.

For more information, please check the Regulations for Grants of INESC TEC and relevant annexes at www.inesctec.pt/bolsas

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