



INTERNAL NOTICE n° 1/2023 Postdoctoral Fellowships in the area of Antimicrobial Resistance Linked to the CEPID Project – FAPESP

The Federal University of São Paulo – UNIFESP, makes public the granting of Postdoctoral Fellowships funded by FAPESP (Fundação de Amparo à Pesquisa do Estado de São Paulo, <http://www.fapesp.br/>):

Objectives:

Selection of 12 (twelve) candidates with experience in antimicrobial resistance for the category of Postdoctoral Fellowship linked to the CEPID Project 2021/10599-3: "Instituto Paulista de Resistência aos Antimicrobianos" (Project ARIES - INSTITUTE OF RESISTANCE TO ANTIMICROBIALS OF SÃO PAULO).

Duration:

The scholarships will last 24 (twenty-four) months and may be renewed for another 24 (twenty-four) months, according to FAPESP's Normative Instruction in force as of 09/01/2020 (<https://fapesp.br/bolsas/pd>). This funding is linked to the development of the following sub-projects:

- **Subproject 1 - Socio-environmental Observatory and Data Science Center: surveillance of ecosystems involved in the emergence and spread of antimicrobial resistance.**

Expected skills: Candidates must possess knowledge in informatics, especially in data analysis, database construction, statistical predictions associated with biological studies in the area. We look for candidates proficient in programming languages like Python or R. Experience with machine learning libraries (e.g., TensorFlow, PyTorch) is highly desirable. The ideal candidate should possess a solid understanding of the principles of data science, including statistical analysis, data visualization, and predictive modeling. Familiarity with data preprocessing techniques and feature engineering is an advantage.

Track record of publications: Applicants should have a solid track record of publishing in journals and conferences in the area of machine learning, data science, or related fields. We value innovative research contributions and the ability to communicate ideas effectively through academic publications.

Responsibilities: As a postdoctoral fellow, the researcher will participate in conducting cutting-edge research in machine learning and data science, exploring innovative algorithms and methodologies. Collaborating with a multidisciplinary team of researchers to address challenging problems and contribute to ongoing projects. Designing and implementing experiments, analyzing, and interpreting results, and presenting findings through conference presentations and journal publications.

Location: The activities took place primarily at the São José dos Campos campus (UNIFESP), with availability to travel and interact with researchers from other campuses and partner institutions of ARIES-CEPID.

List of principal investigators and potential supervisors

Prof. Dr. Arnaldo Lopes Colombo

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• **Subproject 2 - Estimation of disease burden and social and environmental factors of antimicrobial resistance.**

Expected Skills: Candidates should possess knowledge in systems biology, genetics and cell signaling, bioinformatics and its application in the field of antimicrobial resistance. They should be familiar with different drivers of antimicrobial resistance, including environmental, animal, or human health aspects. Candidates must have knowledge in at least two of the following areas: database construction and analysis, phylogeny, pathogen evolution, statistical predictions associated with antimicrobial resistance.

Track record of publications: Applicants should have a solid track record of publishing in journals and conferences in the area of epidemiology of antimicrobial resistance.

Responsibilities: The researcher will engage with cutting-edge research in the area of antimicrobial resistance, collaborating with a multidisciplinary team to address challenging problems and contribute to ongoing projects, planning and implementing experiments, analyzing, and interpreting results, and presenting findings through presentations at conferences and journal publications.

Location: The work will be carried out primarily at the São Paulo or Diadema campuses of UNIFESP, or at the University of São Paulo (USP-Campus São Paulo), with availability to travel and interact with researchers from other campuses and partner institutions of ARIES-CEPID.

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• **Subproject 3 - Characterization of bacterial isolates carrying resistance genes acquired in urban/rural environments and aquatic matrices.**

Expected Skills: Applicants must have experience in the area of microbiology and antimicrobial resistance in bacterial agents, including biological variables related to human, animal, or environmental health.

Track record of publications: Applicants should have a solid track record of journal and conference publications in the area of pathogen genetics, cell signaling, and molecular mechanisms of antimicrobial resistance.

Responsibilities: The researcher will conduct cutting-edge research in the area of antimicrobial resistance, collaborating with a multidisciplinary team of researchers to address challenging problems and contribute to ongoing projects. Will plan and execute experiments, analyze, and interpret results, and present findings at conferences and publications in scientific journals.

Location: The researcher will carry out his or her activities mainly at the São Paulo or Diadema campuses of UNIFESP, as well as at the University of São Paulo (USP-campus São Paulo), with availability to travel and interact with researchers from other campuses and partner institutions of ARIES-CEPID.

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• **Subproject 4 - Monitoring of yeasts and filamentous fungi resistant to antifungals with impact on public health.**

Expected Skills: Aspirants must have experience in the area of microbiology and antifungal resistance, including biological variables related to human, animal, or environmental health. Additional skills required are familiarity with molecular identification of fungi, antifungal susceptibility testing, typing methods for assessing intraspecific variability of yeasts and molds, real-time PCR assays, whole-genome sequencing, use of models to investigate fungal virulence, and analysis of gene expression by RNA-seq, proteomics, or metabolomics.



Track record of publications: Candidates must have a solid track record of journal and conference publications in the area of pathogen genetics, cell signaling, antifungal susceptibility testing, fungal virulence studies, or molecular mechanisms of antifungal resistance.

Responsibilities: The researcher will conduct research in the area of antifungal resistance and collaborate with a multidisciplinary team of researchers to address challenging problems and contribute to ongoing projects. It will have as attributions, plan, and carry out experiments, analyze and interpret results and present findings at conferences and publications in scientific journals.

Location: The chosen researcher will carry out his/her work primarily at UNIFESP's São Paulo or Diadema campi, with availability to travel and interact with researchers from other campuses and partner institutions of ARIES-CEPID.

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• Subproject 5 - New strategies to treat and prevent infections caused by pathogens resistant to AMR (Antimicrobial Resistance).

Expected skills: Applicants must possess knowledge in molecular biology and biochemistry, with a focus on the characterization of antimicrobial substances in general. Knowledge in omic methodologies and ability to develop new applications in the area of prevention, diagnosis, and treatment of infections by resistant pathogens. Additional domains required: classical and molecular identification of bacteria or fungi, typing methods, phenotypic and molecular characterization of antimicrobial resistance mechanisms, use of models for virulence investigation and new treatments, including new strategies not dependent on classical antimicrobials (phages, nanoparticles, microbiota manipulation, among others).

Track record of publications: Applicants should have a solid track record of journal and conference publications in the area of antimicrobial resistance, characterization of resistance mechanisms, and new strategies for treating and preventing infections caused by resistant pathogens.

Responsibilities: The researcher will conduct cutting-edge research in the area of antimicrobial resistance and innovative methods of treatment and prevention of infections by such pathogens, collaborating with a multidisciplinary team of researchers to address challenging problems and contribute to ongoing projects, planning and implementing experiments, analyzing, and interpreting results, and disseminating findings through presentations at conferences, and



publications in journals. We value innovative research contributions and the ability to communicate ideas effectively through academic publications.

Location: The researcher will work primarily at the São Paulo or Diadema campi of UNIFESP, as well as at the University of São Paulo (USP-campus São Paulo), with availability to travel and interact with researchers from other campuses and partner institutions of ARIES-CEPID.

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• Subproject 6 - Innovation Management in AMR: Ecosystems and Creation and Scalability of Startups.

Expected Skills: Candidates must possess robust research planning skills, both qualitative and quantitative, in the field of business in order to better understand the dynamics of innovation in AMR. It is crucial to have a thorough understanding of innovation ecosystem theory, resource-based vision, entrepreneurship, innovation management and strategy. In addition, candidates must be able to control and manage research progress effectively, including assessing the Technology Readiness Level (TRL) of AMR research projects.

Track record of publications: Aspirants should have a solid track record of publishing in journals and conferences in the area of strategy, technology-based entrepreneurship, startups, ecosystems, and innovation management.

Responsibilities: Researchers will be involved in conducting cutting-edge research in the area of strategy, startups, ecosystems, and innovation management, especially in the context of AMR research. A key component of this role includes collecting data through various methods such as project meetings, obtaining secondary data, conducting in-depth interviews, analyzing documents, and managing databases. In addition, they will evaluate the TRL of AMR research projects to facilitate the creation of startups and/or partnerships with companies. They will design and implement: support tools for spin-offs, data collection and analysis protocols, and technology entrepreneurship development in the context of AMR research.

Location: The researcher will work mainly at the University of São Paulo (FEA-USP), with availability to travel and interact with researchers from other campuses and partner institutions of



ARIES-CEPID. The focus will remain on fostering the innovation ecosystem in AMR and encouraging potential startups within the scope of this project.

List of principal investigators and potential supervisors:

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Selection criteria and required documents:

1. Candidate requirements for all subprojects:

- a) Candidates must have completed the doctorate with a topic related to the subproject of interest for less than 7 (seven) years;
- b) Applicants must dedicate themselves fully to the research project;
- c) Fellows may not have an employment relationship, nor receive, during the entire duration of the scholarship, another scholarship from any entity, salary or remuneration from work activities of any nature, except those observed in FAPESP's PR Ordinance No. 05/2012;
- d) Candidates must demonstrate potential to develop scientific independence, motivation for science, history of scientific publications that prove their academic potential and proven mastery of the skills required for the subproject in the application of this notice;
- e) Applicants must have English language skills for reading, scientific writing and speaking.

2. Documents to be sent to all subprojects:

- a) Curriculum Lattes for Brazilian candidates or the Curriculum Vitae for foreign candidates;
- b) ORCID with link to the publications;
- c) Applicant's motivation letter summarizing his/her adherence to the prerequisites and skills required in the selected subproject (less than 500 words and written in English);
- d) Two letters of recommendation;
- e) Certificate or letter proving proficiency in the English language for applicants from countries where English is not the native language;
- f) Doctoral diploma or official letter from the Student Administration of the University in question certifying the defense of the thesis and the date of completion of the doctorate.

3. Registration:

The vacancies are open to candidates of any nationality. Applications are open until 6pm (GMT-3) on Friday, August 18, 2023, and must be formalized through a message sent to the following email address, highlighting in the subject the subproject for which the candidate is applying.

Email address: cepid_aries@colomboal.com.br

Applicants must be available to be interviewed via *Google Meet*.

Final provisions:

The selection process for these vacancies will be based on the individual analysis of the academic merit illustrated in the candidate's resume.

After the merit review, virtual interviews will be scheduled with qualified candidates. Applicants whose resume and motivation letters are deemed insufficient will not be invited to the



virtual interview. The whole process will be coordinated by Prof. Dr. Arnaldo Lopes Colombo, with the participation of the supervisors mentioned in the application of the project.

There is no need for equity in the distribution of candidates among projects. If some subprojects receive more QUALIFIED applicants than others, surplus applications will be reallocated to other subprojects.

After selection, the candidate's documents and the research project will be submitted to FAPESP for final approval. The fellow will receive a postdoctoral fellowship in the amount of R\$ 9,047.40 (nine thousand and forty-seven reais and forty cents) monthly and a research contingency fund equivalent to 10% of the annual scholarship to subsidize academic activities related to the research project. Applicants residing more than 350 km from São Paulo-SP, Brazil, may apply: a) installation assistance, consisting of a single additional portion of the scholarship; b) resources to cover land and/or air transportation expenses, always in a promotional or economic category.

For more information, please contact:

FAPESP Post-doctorate: www.fapesp.br/bolsas/pd

UNIFESP: <https://www.unifesp.br/world/images/arquivos/International%20Students%20and%20Researchers%20guide%20-%202024.01.19-compressed.pdf>

Sao Paulo, 17th July 2023.

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