POSTDOCTORAL FELLOWSHIP RELATED TO BIOTA SYNTHESIS (NUCLEUS OF ANALYSIS AND SYNTHESIS OF NATURE-BASED SOLUTIONS)

FELLOWSHIP #5 - REGULATION OF ZOONOTIC DISEASES IN URBAN AND RURAL LANDSCAPES

1. Job Description:

Fields of knowledge: Public Health, Ecosystem Services, Ecology
FAPESP process: 2020/06694-8
Project title: BIOTA SYNTHESIS – Nucleus of Analysis and Synthesis of Nature-Based Solutions
Principal investigator: Jean Paul Metzger
Postdoctoral project title: Regulation of zoonotic diseases in urban and rural landscapes
Supervisor for this position: Jean Paul Metzger/ Adriano Pinter
Unit/Institution: Institute of Advanced Studies (IEA-USP)
Working area: Disease regulation services applied to policies
Number of scholarships: 1
Duration: The position is offered for 24 months, starting on May/2022.
Grant: BRL 7,373.10 (monthly) plus a research contingency fund equivalent to 10% of value of the scholarship (to purchase items directly related to research activity)
Deadline for submissions: March 14th, 2022, at 10 am, Brasilia Time (BRT), UTC -3
Publishing date: April, 2022
Selection process: The selection process will happen in two phases: *curriculum vitae* evaluation and interview. Only the 3-5 candidates presenting the best evaluated CVs will be interviewed.
Local: IEA-USP: Institute of Advanced Studies of the University of São Paulo, Rua Praça do Relógio, 109, ground floor, Cidade Universitária, Zip Code 05508-050, São Paulo, SP.
Link for submission: https://forms.gle/yVECcrK4eyq3Y5h16
E-mail for contact: biotasintese@usp.br

2. General Postdoctoral fellowships 'profile:

The Biota-Synthesis initiative seeks eight highly qualified postdoctoral fellows to be part of a "Nucleus of Analysis and Synthesis of Nature-based Solutions". This Nucleus will be funded by the São Paulo Research Foundation, FAPESP, for a 5-year period (2022-2026) and brings together researchers from 5 Universities, 7 Research Institutes of the State of São Paulo and 4 Non-Governmental Organizations, as well as technicians and decision makers from the State Secretariats of Infrastructure and Environment, Public Health, and Agriculture. The Nucleus will be based at the Institute for Advanced Studies of the University of São Paulo, city of São Paulo (SP), Brazil.

The goal of the Nucleus is to support the state of São Paulo in the development of socio-environmental public policies related to agricultural sustainability, ecological restoration, zoonosis control, and disease prevention in urban areas, considering essentially nature-based solutions.

The Nucleus will work following a "synthesis science" approach, with heterogeneous and collaborative working groups, which will meet periodically in an immersive way for brainstorming discussions. These meetings will be intercalated with the analysis and modeling of existing databases, where the active participation of postdoctoral fellows is expected. See here for further details.

The desired profile for these postgraduates is of professionals with great ability to work collaboratively in teams, with high capacity for listening and dialogue with researchers and social actors with different backgrounds and professional experiences, in addition to the modeling and analysis capabilities that will be detailed for each profile. The post-doctoral position is open to Brazilian and foreign researchers who have a PhD degree, however fluency in Portuguese is desired to facilitate the discussion and dialogue with the different actors involved in the project. Each postdoctoral fellow will have a specific research project and supervisor, but it is expected that this group of fellows will work together, in close collaboration with the coordination team of the Biota-Synthesis Nucleus.

FAPESP postdoctoral fellowships are competitive (R$ 7,373.10, approximately US$ 1,340.00) and granted for 24 months, with the possibility of extension for two additional years. The fellowship includes a research contingency fund, equivalent to 10% of its annual value which should be spent on items directly related to the research activity.

3. Application procedure:

Applications must be submitted until March 14, 2022, 10 am, Brasilia Time (BRT), UTC -3, through the following link: https://forms.gle/yVECcrK4eyq3Y5h16. If you have any further questions, please contact us at biotasintese@usp.br. A same applicant can apply for more than one scholarship at the same time.

- Curriculum Vitae following FAPESP format, including Lattes (for Brazilian candidates), ORCID and Publon links, as well as citation indicators (e.g. number of publications and citations, H index); please indicate experience in teamwork and with the development of public policy, if applicable;
- Research statement specifying why the candidate is suitable for the fellowship position;
- Three reference persons who can be consulted if the candidate is selected for an interview.

If you don't receive any subscription confirmation by March 20th, please contact us again.

For each of the 8 fellowships, 3-5 candidates will be selected for an interview (to be done virtually). The initial selection will consider the adequacy of the candidate to the fellowship profile, as well as the candidate's professional experience and publication records.

The interviews are expected to take place at the end of March/beginning of April, and the fellowship will begin in May, after validation of the selective process by FAPESP, according to the Institution's norms. All postdoctoral fellows will be formally linked to the postdoctoral program of the University of São Paulo.

4. Summary of Fellowship 5 project (Regulation of zoonotic diseases):

Zoonotic diseases represent 75% of the world's emerging infectious diseases and are caused by pathogens transmissible between animals and humans, constituting a constant concern for public health. Their emergence involves dynamic interactions between wild, domestic, and human animal populations in an environment undergoing rapid change. Changes in land use, mainly deforestation, forest fragmentation, agricultural use and urbanization, have the potential to impact the dynamics of diseases, both directly and indirectly, because it alters the community composition and the behavior of both hosts and vectors. Deforestation, for example, decreases the habitat available for many species, leading to species community's simplification and increasing the abundance of vectors and hosts. In addition, it can facilitate the introduction of exotic/invasive species, which can also act as hosts or amplifiers of some zoonotic diseases.

The One Health approach is typically multidisciplinary and denotes collaborative participation of different stakeholders and specialized professionals who cross animal, human, and environmental health boundaries to understand the ecology of each zoonotic disease in order to perform risk assessments and develop response and control plans. Focusing on the use of the concepts and practices understood in this approach, this project aims to investigate the environmental mechanisms that may lead to the spread of recurrent zoonoses under threat of emergency and re-emergence in the state of São Paulo, developing predictive models of risk (for current and future scenarios), in order to subsidize public policies for mitigation, prevention and control actions. More specifically, the goals of this project are the creation of conceptual models, which aim to understand the role of exotic species and which environmental mechanisms lead to the occurrence and spread of these diseases, both in rural and in urban landscapes; and the development of predictive risk models in scenarios of land use and climate change. The result of these models will subsidize public policies to prevent and control these zoonotic diseases, always considering that human, animal and environmental health are related.

The post-doc researcher will lead the following activities:

Literature review on the main environmental drivers, including invasive amplifiers, that lead to an increase in the population of zoonotic disease vectors and hosts, and consequently increase the risk of transmission to humans. This review will be conducted systematically from the available literature, and will generate a conceptual model, which will provide the theoretical basis for the development of predictive risk models.

Integration and standardization of the different databases existing in the different institutions. The existing databases on vectors, hosts, and pathogens, will be searched in the different institutions linked to public health in order to be unified and standardized.

Implementation of accurate predictive models of transmission risk. The occurrence and abundance data of vectors, hosts, invasive amplifiers and pathogens, obtained from the different existing databases will be associated with the environmental variables listed in the conceptual models to generate predictive models of transmission risk. These models will determine the environmental factors responsible for the increased transmission risk of these pathogens and identify locations where preventive measures or vaccination campaigns should be allocated.

Evaluate the impacts of climate change scenarios on the transmission risk of these zoonotic diseases. The impacts of the high emission (RCP8.5) and intermediate emission (RCP4.5) scenarios, for the years 2050 and 2100, on the transmission risk of these zoonotic diseases will be assessed. Land use change scenarios will also be developed, along with climate change scenarios, to test how much landscape management can contribute in mitigating the effects of climate change on human health. Still, models of invasive species control (amplifiers) can be developed to assess the transmission risk of pathogens in different scenarios. These results will generate policies for preventive actions in future scenarios, which may prevent future outbreaks of these diseases.

5. Requirements for the position:

- PhD in Public Health, Ecology, Geography, Environmental Sciences or related fields (PhD certificate will be required for the acceptance of the grant), obtained no longer than 7 years before the grant acceptance date;

- Experience in spatial analysis, landscape ecology and statistical modeling;
- Literature review skills;
- Database management skills;
- Good knowledge of Portuguese and English.