JOB DESCRIPTION

The University of Paris-Saclay is a multidisciplinary university with a strong scientific and health focus. It is one of the most prestigious universities in France and is ranked among the top universities in the world. It has 78 internationally recognized laboratories, 30,200 students including 2,400 doctoral students and 4,800 foreign students, 4,300 teacher-researchers and researchers, and 3,100 engineering, technical and administrative staff. It has a precious environmental heritage integrated into an exceptional setting, particularly on its Orsay campus.
Site : https://www.universite-paris-saclay.fr/en

Application for a post-doctorate of 2 years:
Top_Pred project funded by National Research Agency

Function: post-doctorate CDD 2 years
Type of job* : research/post doctoral fellow, data processing and analysis * REME, REFERENS, BIBLIOPHILE
Job description form
Category : A Body: ITRF BAP: A " Biology and health, life and earth sciences ": biomolecular analysis (applied to ecological research) Duration of the contract: 2 years Planned recruitment: between October and December 2021
Job location
Administrative : University of Paris Saclay, Geographical : University of Paris Saclay, bat 362 avenue du doyen André Guinier 91405 Orsay Cedex
Missions

Global description (laboratory and project) :

The Ecology, Systematics and Evolution laboratory (ESE lab) conducts research on the dynamics of biodiversity and the evolution and functioning of ecosystems. The TOP_PRED project ("Top predator dynamics in suburban agroecosystems: their role in crop consumer regulation") conducted within the BIOM team focuses on the analysis of trophic interactions between two abundant mesopredators in peri-urban areas - **domestic cats** (Felis catus), **red foxes** (Vulpes vulpes) and their prey. These predators contribute directly to the regulation of crop consumers. However, in disturbed ecosystems such as peri-urban agroecosystems, their populations are subject to large fluctuations due to land management choices and human practices. These **disturbances cause conflicts involving humans, predators and crop consumers**. The main objective of the Top_Pred project is to model predator-prey relationships in peri-urban agroecosystems in order to optimize the preservation of biodiversity and ecosystem services in these areas. The project's team of ecologists and modelers will study predator behaviors and produce dynamic food web models to predict possible changes in predator-prey interactions in response to different scenarios of anthropogenic pressures.

The **trophic interaction frequencies** of these models are currently estimated by the analysis of observable remains of predator feces. During this project, these macroscopic analyses will be **complemented by molecular analyses** to :

- **Refine the resolution of identification** of prey consumed and predator that produced the scat by a meta-barcoding approach
- **Assign each scat to a predator individual** using microsatellites and/or SNPs genotyping

The results of these molecular analyses will help to **clarify population and individual trophic behaviors**.

Main activities of recruited post doctorate :

For this position we are looking for a profile with **laboratory and molecular analysis skills**, ideally familiar with environmental samples (complex and degraded DNA) analysis. The person to be recruited will be responsible for **conducting research in molecular ecology** within the framework of the Top_Pred project.

His/her research activities will consist in:

- Lab: Preparing cat and fox fecal samples for DNA extraction; primer selection, testing and multiplexing; PCR amplification and preparation of high-throughput sequencing libraries.

- bioinformatics: Filtering and analysis of high-throughput sequencing data using bioinformatics pipelines (taxonomic assignment of amplicons for the meta-barcoding approach, individual assignment for the non-invasive capture-mark-recapture approach using microsatellite markers or SNPs)

- Data analysis and paper writing: Statistical analysis and dissemination of research results through the writing of scientific articles and presentations at conferences (national or international).

Special conditions of exercise (Housing, specific hours, etc. ...) : No
Supervision : Yes   Number of agents supervised: possibly 1 doctorate (partially), master students
Project management: NO
The position is not easily accessible to people with disabilities because of the non-adapted premises

Skills*

Knowledge:
- Issues related to the analysis of environmental DNA samples
- In-depth knowledge of non-invasive capture-mark-recapture data analysis (microsatellite or SNP genotyping from non-invasive samples like feces)
- In-depth knowledge of bioinformatics analysis techniques for high-throughput sequencing and genotyping data sets.
- Desired knowledge of population and landscape genetic analysis

Know-how:
- Mastery of laboratory techniques (from extraction to preparation of sequencing libraries)
- Mastery of programming (R, Python)
- Preparation and statistical analysis of sequencing and genotyping databases
- Fluency in oral and written English

Soft skills:
- Ability to listen, good interpersonal skills
- Autonomy and sense of initiative
- Intellectual curiosity
- Sense of teamwork

* *Conformément à l'annexe de l'arrêté du 18 mars 2013 (NOR :MENH1305559A) -* ***REME, REFERENS, BIBLIOPHILE***