

METAGENOMIC IDENTIFICATION OF THE DRIVERS OF THE ANTIMICROBIAL RESISTANCE TRANSMISSION ACROSS ONE HEALTH ECOSYSTEMS

Location: University of Limoges, Limoges (France)

Research Unit: Antimicrobials: molecular supports of resistances and therapeutic innovations

Supervisor: Marie-Cécile Ploy

Funding: from 01-10-2023 to 30-09-2026

Funding Origin: Ministériel

Employer: Université de Limoges

Start: October 1st, 2023

Application Close Date: June 5th, 2023, but the candidate MUST contact Dr. Thibault Stalder (tstalder@uidaho.edu) and Marie-Cécile Ploy (marie-cecile.ploy@unilim.fr) before May 24, 2023.

About the opportunity:

Antimicrobial resistance (AMR) in pathogens is a serious human health threat. The emergence of AMR is driven by the sharing of resistance genes between bacteria from animals, humans, and the environment. Therefore, to curtail the emergence and spread of AMR, research, surveillance, and intervention strategies must integrate One Health approaches. In this context, the UMR INSERM 1092 uses the One Health framework to explore the eco-evolutionary trajectories of AMR spread and to enhance surveillance systems.

The acquisition of AMR by pathogens is mainly due to the sharing of AMR plasmids, mobile genetic elements that can confer resistance to various antibiotics. Evidence points out that those plasmids have and are crossing ecological boundaries between humans, animals, and the environment while rapidly spreading worldwide. However, we still poorly understand the trajectories leading these plasmids to hop between environmental, animal, or human ecosystems and end up in deadly human pathogens. This Ph. D. thesis aims to identify the ecological drivers of AMR transmission across a One Health continuum. To address this objective, the candidate will use microbiology, molecular biology, and bioinformatic tools integrated within a metagenomic approach to identify key bacteria responsible for transferring AMR genes and plasmids across human, animal, and environmental habitats. Ultimately, the results from this Ph.D. will lead to the development of tools to support current One Health surveillance systems of AMR and aid future development of strategies to slow the spread of antimicrobial resistance.

In parallel, the candidate will contribute to isolating some of the AR plasmids and bacteria and performing genomics analysis. More broadly, the candidate will be part of a dynamic and internationally recognized research group working on AMR. The UMR1092 has long-standing experience and expertise in applying the One Health approach, microbiology and molecular biology, and translational research to address AR.

Candidate profile:

Ideal candidates will *i)* be curious and motivated, *ii)* have a background in microbiology, molecular biology, and a good knowledge of bioinformatics, *iii)* have experience or strong motivation to learn programming languages such as bash, R, and python, *iv)* have good English communication for science.

The candidate will hold a Master degree by the start of the contract.

Application:

Send a CV and a cover letter (in English or French) to Dr. Marie-Cécile Ploy (marie-cecile.ploy@unilim.fr) and Dr. Thibault Stalder: (tstalder@uidaho.edu). The selected candidates will be contacted to apply for the funding opportunity through the doctoral school.