

## Job description

A 2-year post-doctoral position in mathematical modelling of infectious diseases is available to work with Pr. Laura Temime at the Conservatoire national des arts et métiers in Paris, in collaboration with French and German participants in the ANR-DFG ARCANE research project (<https://arcane-project.eu/>)

The post-holder will combine mathematical modelling, network science and simulation with epidemiological data analysis to study how antimicrobial-resistant bacteria (ARB) spread between healthcare settings. The work will extend on previous modelling and epidemiological research led by our group over the last decade (references below), to:

- use longitudinal French data on inter-hospital patient transfers to reconstruct a temporal weighted healthcare network
- analyze longitudinal French surveillance data on carbapenemase-producing Enterobacteriaceae within hospitals in light of the reconstructed healthcare network
- develop a mathematical metapopulation model of ARB spread over this network
- use model simulations informed by the analyzed data to explore the impact of seeding events on the epidemic risk

The overall objective is to better understand how the time-evolving structure of healthcare networks dynamically impacts the spread of ARB at the regional and national levels, with the aim of proposing efficient strategies to control this spread.

## Applications

Applicants should have a PhD in infectious disease epidemiology, mathematical modelling, network science or computational biology. They should have a strong background in computer programming, modelling and statistics, and excellent communication skills. Experience in infectious disease epidemiology or healthcare-related research would be an advantage.

Interested candidates should send their application (CV including list of publications, motivation letter and names of two referees) to Laura Temime ([laura.temime@lecnam.net](mailto:laura.temime@lecnam.net)). Applications will be evaluated continuously until the position is filled, with a start date between September 2025 and January 2026.

## About the lab

The “Modélisation, Épidémiologie et Surveillance des Risques Sanitaires” (MESuRS) lab (<http://mesurs.cnam.fr/>) focuses on employing quantitative approaches (epidemiology, biostatistics, mathematical modelling) to assess and manage both infectious and occupational health risks. Our team consists of approx. 15 researchers at different career stages coming from a wide range of backgrounds (biology, mathematics, engineering). We have multiple national and international collaborations, and are affiliated with both the Cnam (a national higher education and research institution) and the Institut Pasteur via the Pasteur-Cnam research unit on Infectious and Emerging Risks (PACRI).

Lab address: 292 rue Saint-Martin, 75003 Paris, France

## References

Nekkab N, et al. Spread of hospital-acquired infections: A comparison of healthcare networks. *PLoS Comput Biol* 2017; 13: e1005666–e1005666.

Nekkab N, et al. Assessing the role of inter-facility patient transfer in the spread of carbapenemase-producing Enterobacteriaceae: the case of France between 2012 and 2015. *Sci Rep* 2020; 10: 14910.