



18-months postdoc position in Mathematical modelling applied to quantitative antimicrobial resistance

Working place & Conditions. A postdoc position in applied mathematics is available at the [IRD](#) in Sénégal. The position is based at [École polytechnique de Thiès](#) and will start on September 1st 2023.

Job description. In view of the multiple pathogen evolution capabilities, the long-term efficacy of antimicrobials is a major public health problem. Defining sustainable strategies for managing antimicrobials efficiency, in space and time, by considering the continuous character of antimicrobial resistance –*ie.* quantitative resistance– with varying degrees of intermediate resistance. The project is aiming to develop Mathematical/Computational models for quantitative antimicrobial resistance at both between- and within-host scales. The successful candidate will develop mathematical models through an approach combining predictive mathematical analysis, scientific computing, optimization-control of an integro-differential system with non-local terms. The successful candidate will be involved in the project [ANR-QUASAR](#), and will collaborate with a team of applied mathematicians with strong experience in Mathematical/Computational modelling of infectious diseases.

Targeted profile.

- Strong experience in mathematical modeling (including ODE and/or PDE).
- Strong experience in numerical simulations of models.
- Ability to work with a minimum supervision and to *bring new ideas*.
- Ability to work in an interdisciplinary project involving mathematicians and biologists.

Application procedures & Contact. Send your application –deadline June 30th 2023– in a single PDF file by email to Ramsès Djidjou-Demasse (ramses.djidjoudemasse@ird.fr). Your application must include (i) a letter stating your motivations for this project or *related project you want to work on*, (ii) a CV including the names of two referees (with e-mail addresses).

Some references.

F. Blanquart. Evolutionary epidemiology models to predict the dynamics of antibiotic resistance. *Evolutionary applications*, [PDF](#) 2019.

R. Djidjou-Demasse, M. T. Sofonea, M. Choisy, S. Alizon. Within-host evolutionary dynamics of antimicrobial quantitative resistance. *Peer Community in Mathematical and Computational Biology*, 2021. [PDF](#).

R. Djidjou-Demasse, Samuel Alizon, Mircea T. Sofonea. Within-host bacterial growth dynamics with both mutation and horizontal gene transfer. *Journal Of Mathematical Biology*, 2021. [PDF](#)

R. Djidjou-Demasse, M.L. Mann-Manyombe, A. Mendy, O. Seydi. Linking within-and between-host scales for understanding the evolutionary dynamics of quantitative antimicrobial resistance. *HAL*, 2023. [PDF](#)