

Chair INSERM 2022, PPR Antibiorésistance

COMBINE



anr[®]
agence nationale
de la recherche
AU SERVICE DE LA SCIENCE

Combine modelling of patient pathways and monitoring of sewage to prevent the regional spread of multi-drug resistant *Enterobacterales* across the healthcare network.

The overall aims of this project are:

- 1) To identify healthcare facilities influencing the spread of multi-drug resistant *Enterobacterales* across the network at the regional scale.
- 2) To develop an innovative multi-drug resistant *Enterobacterales* surveillance and prevention strategy based on the analysis of wastewater in facilities acting as facilitators for the spread of multi-drug resistant *Enterobacterales*.
- 3) To model the impact of the coordinated sewage surveillance and infection prevention and control strategies.

Team COMBINE

Scientific coordinator



Gabriel BIRGAND
Praticien Hospitalier
CPias Pays de la Loire
CHU de Nantes

Steering committee



Didier HOCQUET
Professeur, praticien hospitalier
Laboratoire de bactériologie,
CHU de Besançon



Laura TEMIME
Professeure,
Unité Mesure
CNAM



Stéphane CORVEC
Professeur, praticien hospitalier
Laboratoire de bactériologie,
CHU de Nantes

COMBINE technical team



Nicolas HELSENS
Pharmacien
Ingénieur de recherche
CHU de Nantes



Maxence MOUGON
Ingénieur en techniques biologiques
Nantes Université

PhD Students



Cécile FERRIOT
Médecin Santé Publique
ED Biologie Santé
Nantes Université



Elise HODBERT
Agronome, Epidémiologiste
ED SMI
CNAM

Fundings

This work was conducted as part of the COMBINE research program, which benefitted from a government grant managed by the Agence Nationale de la Recherche under the Programme France 2030 with the reference ANR 22 PAMR 0003.



Academic partners

The COMBINE project is conducted in collaboration with the following academic partners:



Publications

<https://doi.org/10.1001/jamanetworkopen.2025.21165>; <https://doi.org/10.1186/s13756-025-01576-9>
<https://doi.org/10.1093/jac/dkae431>; <https://doi.org/10.1038/s41579-024-01076-4>

Contact

Gabriel BIRGAND, Praticien Hospitalier, CPias Pays de la Loire , CHU de Nantes, gabriel.birgand@chu-nantes.fr