

# BioRodDis: a Transdisciplinary EcoHealth project to evaluate the relationships between micromammal biodiversity and zoonoses risks in Europe



Arpin I<sup>1</sup>, Massart C<sup>1</sup>, Bourret V<sup>2</sup>, Castel G<sup>1</sup>, Colombo VC<sup>3</sup>, Eccard J<sup>4</sup>, Firozpoor J<sup>4</sup>, Grzybek M<sup>5</sup>, Henttonen H<sup>2</sup>, Leirs H<sup>3</sup>, McManus A<sup>6</sup>, Roche B<sup>7</sup>, Sironen T<sup>2</sup>, Sluydts V<sup>3</sup>, Stuart P<sup>6</sup>, Zintl A<sup>8</sup>, Charbonnel N<sup>1</sup>  
 Nathalie.charbonnel@inrae.fr

## Our Objectives

- Improve the understanding and management of rodent-borne zoonoses in forests and urban parks, from the biological and socio-environmental points of view;
- Implement a multi-disciplinary approach and a close dialogue between disciplines (inter-disciplinarity);
- Develop transdisciplinarity through the definition of a common conceptual EcoHealth framework;
- Two-years into the BioRodDis project, evaluate its capacity to achieve transdisciplinarity.

## State of the Art

How does biological diversity alteration lead to zoonotic diseases emergence? This question has received a lot of attention, because of the concomitant occurrence of habitat alteration, biodiversity loss as well as pathogen transmission and emergence from wildlife. However, the scientific community is struggling to understand exactly how biodiversity affects disease emergence.

A transdisciplinary EcoHealth approach is required to address this problem.



The Biodiversa-BioRodDis project (2020-2023) aims to elucidate the interlinkages between biodiversity and diseases at local and European scales. We focus on rodent-borne diseases as rodents are important reservoirs of infectious agents, with a high transmission potential for humans and domestic animals. We consider forests and urban parks as environments where rodents are abundant, human/domestic wildlife interactions do occur, and efforts are undertaken to preserve biodiversity.

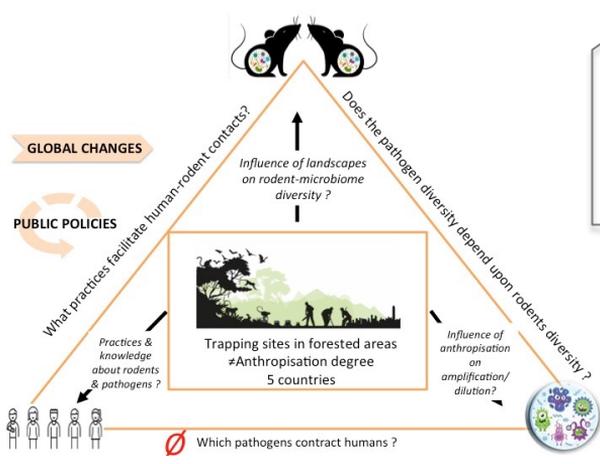
## Findings

Definition of a common EcoHealth framework based on shared theories, concepts and approaches  
 « What relationships between living beings favour the circulation and transmission of rodent-borne pathogens ? »

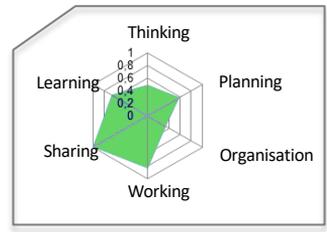
High scores for all aspects related to the description of the system, the division of tasks within the team and the sharing of data and methods.

Low scores for all criteria related to the involvement of societal actors, in all phases of the project cycle.

### BioRodDis framework



### Semi-quantitative evaluation of inter- & transdisciplinarity



A consulting rather than participatory transdisciplinary project

## Conclusion

While working on rodent borne diseases, a relatively weakly wicked problem in Europe during the Covid crisis, a super wicked problem, affected the transdisciplinarity of the project. 1- It undermined our capacity to involve many societal actors that we had planned to involve. 2- It allowed for productive discussions with some local societal actors about issues that would probably not have been addressed in the case of super wicked problems.

## Methods



Disciplines gathered

- Ecology
- Virology
- Microbiology
- Modeling
- Sociology

Interviews of project members

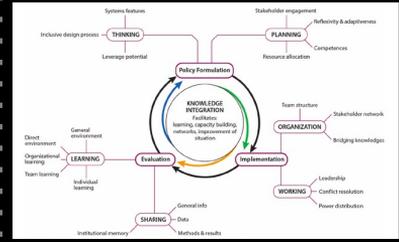
Meetings

Identification & interviews of stakeholders

1- Users and managers of the sites surveyed and general practitioners operating in the vicinity of the sites

2- Stakeholders from the conservation, veterinary, human health, and public health sectors, interested in rodents and their pathogens at the national or European level

EVOLVINC: semi-quantitative evaluation of Inter and Transdisciplinary Research



DOI:10.5751/ES-10935-240236



- Affiliations
- 1 INRAE, France
  - 2 University of Helsinki, Finland
  - 3 University of Antwerpen, Belgium
  - 4 University of Potsdam, Germany
  - 5 Medical University of Gdansk, Poland
  - 6 Munster Technological University, Ireland
  - 7 Institut de recherche pour le développement (IRD), France
  - 8 University College Dublin, Ireland