

Priority Research Programme (Programme Prioritaire de Recherche - PPR) on antibiotic resistance

Call for proposals

"A One Health Community on antibiotic resistance: Establishment of a meta-network of professionals in the field of antibiotic resistance "

BACKGROUND

Antimicrobial resistance is a complex problem that affects all elements of our ecosystem. It spreads mainly through horizontal gene transfer between bacteria and the propagation of resistant bacteria between individuals of the same or different species, and through the environment, in turn susceptible to global changes (climate, biodiversity loss, etc.). To meet the challenges of antibiotic resistance, coordinated and harmonized actions between professionals of human health, veterinary health and of the environment are needed, integrated into a "One Health" approach.

Several initiatives have been implemented at the international level in a One Health context, such as the Global Plan on Antimicrobial Resistance developed by the World Health Organisation¹, the European Commission's Joint Programming Initiative on Antimicrobial Resistance (JPI-AMR)², or the European Union Joint Action on Antimicrobial Resistance and Healthcare-Associated Infections (EU-JAMRAI), coordinated by France³. At the national level, such initiatives could benefit from further structuring, harmonisation and coherence. Several networks exist in the three One Health sectors (human, animal, and environment), however, they pursue independent objectives and implement heterogeneous solutions and procedures. Thus, a national structure is lacking to interconnect all the existing networks and, if necessary, include new ones, with the common aim of sharing skills, knowledge, expertise, and methodologies to accelerate research on antimicrobial resistance.

At the request of the General Secretariat for Investment (Secrétariat Général pour l'Investissement - SGPI) and in accordance with the recommendations of the inter-ministerial roadmap⁴ and the Carlet report⁵, the Priority Research Programme (Programme Prioritaire de Recherche - PPR) on antibiotic resistance integrates several structuring tools, including the establishment of a professional meta-network. This will be aimed at federating all researchers and professionals in the field of antimicrobial resistance and facilitating sharing of expertise. The purpose of the meta-network is to gather and

¹ World Health Organization. Global action plan on antimicrobial resistance 2015 [Internet].

https://apps.who.int/iris/bitstream/handle/10665/193736/9789241509763_eng.pdf?sequence=1

² JPI AMR - Joint Programming Initiative on Antimicrobial Resistance. Strategic Research Agenda [Internet]. 2014.

<https://www.jpiamr.eu/activities/strategicresearchagenda/>

³ EU-JAMRAI (European Union Joint Action on Antimicrobial Resistance and Healthcare-Associated Infections) [Internet].

<https://eu-jamrai.eu>

⁴ Inter-ministerial Committee for Health. Roadmap: Controlling Bacterial Resistance to Antibiotics [Internet]. 2016.

https://solidarites-sante.gouv.fr/IMG/pdf/feuille_de_route_antibioresistance_nov_2016.pdf

⁵ Rapport Carlet. " Tous ensemble, sauvons les antibiotiques " [Internet]. 2015. https://solidarites-sante.gouv.fr/IMG/pdf/rapport_antibiotiques.pdf

consolidate connections between experts, groups and structures, united under a **“One Health Community”** focused on antibiotic resistance, working collectively to develop joint and coordinated solutions. This interdisciplinary scientific community will integrate existing and new networks built around the problematic of antibiotic resistance. It will promote exchange and collaborations among experts of the One Health sectors, and encourage sharing of data from various sources (clinical, socio-cultural, veterinary and environmental). Furthermore, such a community will facilitate interactions between fields and the development of new and unexploited links and partnerships.

These interconnections will improve the coordination of French forces and accelerate research on antibiotic resistance at the interface of the disciplines. Ultimately, this will elicit effective strategies of bacterial infection management in humans and animals, involving the environment, to reduce the dissemination chain of antibiotic-resistant bacteria and resistance genes. The meta-network will also allow to evaluate new diagnostic tools, therapeutic strategies and interventions, and to measure more specifically the impact and real costs of antimicrobial resistance. Sharing of respective experiences, including those related to antimicrobial stewardship⁶, will be improved, providing the basis to develop infection prevention and control strategies and updated operational guidelines. This platform, as yet non-existent in France, will be integrated into the European and international dynamics on antimicrobial resistance, while reinforcing France’s visibility in this competitive field.

OBJECTIVES OF THE CALL FOR PROPOSALS

The objective of the call for projects is to enable the development of a professional meta-network that will include scientific networks, networks of expertise and professional networks, for research purposes, surveillance and monitoring, and to support changes in concepts and practices related to antibiotic resistance, respectively. This meta-network will be articulated in three axes, each supported by dedicated financial means:

1. An online platform to host and facilitate the activities and animation of the meta-network.

This structure will identify all the actors, centres and services involved in research on antibiotic resistance, their resources, as well as studies in preparation, in progress or completed. It will represent a central point from which to promote knowledge, skill and resource sharing, therefore providing support for design, coordination and implementation of collaborative projects, for joint submission of projects for national or European funding, and for the development of common tools (recommendations, guidelines, stewardship actions, communication tools). This national platform will also serve as an online support for the professional meta-network.

⁶ **Antimicrobial stewardship:** A coherent set of actions that promote the responsible use of antimicrobials. This definition can apply to actions at the individual, national and global level, as well as those that affect human health, animal health and the environment.

World Health Organization. (2019). Antimicrobial stewardship programmes in health-care facilities in low- and middle-income countries: a WHO practical toolkit. World Health Organization. <https://apps.who.int/iris/handle/10665/329404>.

- 2. Professional networks in human, animal or environmental health, or thematic networks focused on issues related to antimicrobial resistance**, including - but not limited to - those listed in Annex 1. These networks could benefit from incentive funding for structuring, if necessary, and joining the meta-network. The meta-network could then evolve to integrate existing sub-networks (formalised or not) from the human, animal, and environmental sectors, and stimulate the creation of new networks when these are lacking, while taking into account heterogeneities in the level of development of networks in the three sectors. Transdisciplinary and cross-sectoral networks around common challenges will be particularly encouraged.
- 3. A programme to strengthen the skills** of the meta-network members through organisation of regular training courses, seminars, conferences and teleconferences, and to implement training courses for young graduates or trainees. It will also aim to stimulate and improve education and communication with the general public and patient associations on the themes of antibiotic resistance.

DIRECTIONS FOR THE DEVELOPMENT OF THE META-NETWORK

The professional meta-network on antimicrobial resistance will propose solutions and tools to promote communication, which is currently fragmentary, between the human health, veterinary health and environmental sectors. Consultations with representatives of the three sectors enabled the identification of the needs of the scientific community. In particular, the need to develop platforms for knowledge sharing between the hospital sectors, veterinary schools and university research activities, and between human and animal health professionals was highlighted. Consolidation of the links between veterinarians and environmental professionals is also urgent, the latter lacking access to essential information on environmental practices to control antimicrobial resistance derived from livestock treatments, and to persons of reference in the veterinary field. A strong need was expressed for the creation of new networks in the environmental field, especially in the aquatic, soil and wildlife areas, promoting exchanges and collaborations within the sector and with the human and animal health communities. The establishment of new cross-sectoral networks is particularly encouraged, enabling scientists and professionals from the three One Health sectors to gather their skills to address common issues. Networks led by professionals of the One Health sectors and mobilizing actors of the human and social sciences and of the socio-economic sphere will complete the meta-network platform by strengthening societal involvement. A non-exhaustive list of issues that these cross-sectoral networks will be able to tackle includes surveillance, antibiotic use, the socio-cultural roots of antibiotic resistance, and interventions addressing the dissemination of resistant bacteria.

It is important to encourage synergy within the meta-network, between the professional and thematic networks, and further with the Observatory of the PPR on Antibiotic Resistance, to address common questions such as the study of discourses, norms and practices related to the use of antibiotics, in order to investigate the socio-economic aspects and the socio-cultural roots of the problem.

Proposals for the establishment of the platform must include the elements of governance of the meta-network, the detailed plan of the project according to the specifications outlined above, and solutions envisaged to ensure the durability of the meta-network beyond the initial funding period.

Annex 1 presents a non-exhaustive list of the networks identified to date that could be integrated in the meta-network.

FUNDING

In agreement with the proposal of the PPR directorate and granted by the SGPI, a seed funding of €1.4 M will be allocated for the establishment and development of the professional meta-network during the first three years. The funding will be distributed among the three objectives as detailed below. Proposals for the durability of the meta-network will have to be included in the project proposal for institutions applying to host the platform (objective 1).

Objective 1 (establishment and animation of the informatics platform), a maximum budget of €500 k will be allocated.

Objective 2 (incentive funding for existing networks or structuring of new networks), a maximum budget of €20 k per existing network joining the meta-network, and a maximum budget of €50 k Euros for the creation of new networks will be allocated.

Objective 3 (Skill strengthening and training), a maximum budget of €300 k will be allocated.

ELIGIBILITY CRITERIA AND SELECTION

Applicants must respond to the call by proposing solutions to one or more of the three objectives described above. Projects must propose an approach to formalise the links between Objectives 1 to 3 in order to ensure effective and structured coordination.

Prerequisites for the three objectives:

- Belong to a research team, affiliated to the public sector, working in the field of antibiotic resistance,
- Be based in France.

Specific criteria for each objective:

- Objective 1: To have the means for the IT functionalities and capacities necessary for hosting the meta-network platform,

- Objective 2: To be the representative of an existing network or the spokesperson of a network to be developed, in particular on themes bringing together actors from different sectors, as well as socio-economic actors, through a participative approach. For networks in the process of development, a letter of support from at least two institutions/future members of the network is required.
- Objective 3: To be based in an institution that already provides training and promotes good practices in the field of antimicrobial resistance in one or more of the three sectors.

The selection of candidates will be made considering, among others, the following elements:

- The applicant's ability to develop collaborations, proven by current or past multidisciplinary projects involving multiple partners,
- The team's excellence in research on antibiotic resistance, demonstrated by the number and quality of publications on the subject,
- The quality of the proposals and its "One Health" vision to implement collaborations and mutualisation between sectors (human, animal and environment).

Appendix 1

Human health sector:

Over the past 5 years, the surveillance networks have been restructured under the aegis of the national public health agency (**Santé Publique France**), which has been given the mission to coordinate surveillance, studies and expertise on healthcare-associated infections and resistance to anti-infective agents. Networks of relevance include the network of the centres for prevention of healthcare-associated infections (**CPias**) and their missions, the national mission for surveillance and prevention of antibiotic resistance in healthcare institutions (**SPARES**), managed by the CPias of Grand-Est, in association with the CPias Nouvelle Aquitaine and the microbiology department of Limoges University Hospital, monitoring antibiotic consumption and bacterial resistance and assessing prevention of cross transmission of multi-resistant and highly resistant bacteria. An identical mission for the general practice and medico-social establishments (**PRIMO**) is carried out by the CPias Pays de Loire in association with the CPias Grand Est.

The clinical research networks include: **CRICS-TRIGGERSEP** (Trial Group for Global Evaluation and Research in Sepsis), an F-CRIN-labelled network which brings together forces in fundamental and translational research in the field of sepsis; **RENARCI** (“Réseau national de recherche clinique en infectiologie”, national network on clinical research and infectiology), which aims to increase France’s visibility and attractiveness in clinical research in infectiology for the development of new anti-infectious agents; **REA REZO**, carrying out annual monitoring of antibiotic consumption for infections acquired in intensive care units, which brings together more than 100 intensive care units in France; **OUTCOMEREA**, an association aiming at developing research and teaching activities to improve care of patients in severe conditions, and **CLIN-Net France**, a subsidiary of the European network CLIN-Net, itself a member of ECRAID, whose objective is to act at the European level against antibiotic resistance and to facilitate the implementation of studies to develop new anti-infectious agents.

Animal Health Sector:

Existing animal health surveillance or research networks and observatories include **RESAPATH**, an epidemio-surveillance network for antibiotic resistance of animal pathogenic bacteria, resulting from a partnership between Anses and French public and private veterinary diagnostic laboratories; the Network for Research on Antibiotics for Animals (Réseau Recherche Antibiotiques Animal - **R2A2**), coordinated by Inrae and focused on the use of antibiotics in livestock; **ECOSCOPE**, the observation data centre for biodiversity research.

The informal networks that could be integrated into the meta-network include the **pilot network of veterinary practitioners** of regional reference in the field of antibiotics, led by the National Society of veterinary technical groups (Société nationale des groupements techniques vétérinaires - SNGTV), together with other veterinary professional organisations (in particular AFVAC), which aims to

strengthen the continuing education and information of veterinarians; the network of the four **Veterinary University Hospital Centres** (Centres Hospitalier Universitaires Vétérinaires - CHUV) and the four French veterinary schools on which the CHUVs rely; the **Veterinary Public Health Hub**, currently developing in Lyon between the veterinary school, Fondation Mérieux and other industrial partners, focusing on four research areas, including antibiotic resistance.

Environment sector:

The main actors identified in the environmental sector include: the network of water agencies, the informal network of the chambers of agriculture, the teams involved in the collaborative projects of the Foundation for Research on Biodiversity, **OZCAR** (Observatories of the Critical Zone: application and research) dedicated to the study of the functioning of land surfaces and subsoils, and the network **Zones atelier** (ZA) which focuses on a functional unit (e.g. a river and its basin, agricultural or urban landscapes).

Several environmental monitoring and data collection networks have been set up. However, each has its own objective and autonomous mode of operation, and a national structure to interconnect them all is lacking.



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