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AGENCE NATIONALE DE LA RECHERCHE ANR

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Calls for structuring tools - PPR on Antimicrobial resistance: 3 projects selected

On 01 October 2020, three calls for structuring tools were launched by the French National Institute for Health and Medical Research (Inserm), coordinator of the Priority Research Programme (*Programme Prioritaire de Recherche,* PPR) on Antimicrobial resistance, financed with a €40 million budget by the Government. These calls represent the second action of the PPR on Antimicrobial Resistance and complement the call for research projects "Antibiotic resistance: understand, innovate, act", funding projects since February 2021.

In response to each call for proposals, identified by Inserm and its partners, national consultation meetings were organised by the PPR directorate. These led to the development of consortia aiming to structure research on antimicrobial resistance in mainland France and in the French overseas departments and territories, with a One Health approach. These consortia gather all disciplines ranging from fundamental to clinical research in the three sectors of human, animal, and environmental health, and include social sciences and banks of digital, mathematical and (bio)informatic tool.

The three selected projects:

ABRomics-PF, PROMISE and DOSA

were evaluated by an international jury and are funded with a total budget of € 4M

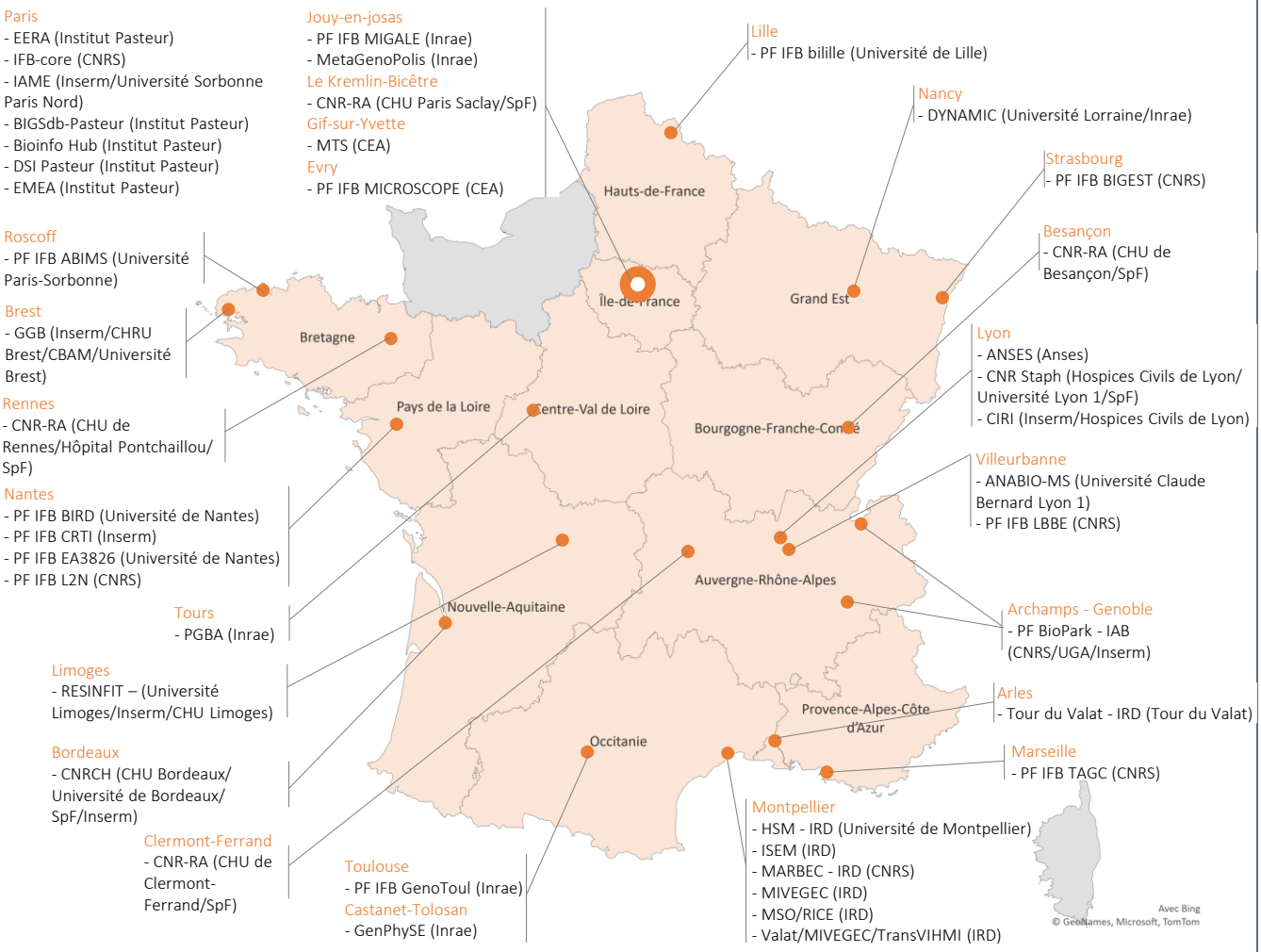
Please find below a description of the three projects and their networks.

ABRomics-PF: a numerical platform on antimicrobial resistance to store, integrate, analyse and share multi-omics data

Coordinators: Claudine MEDIGUE and Philippe GLASER
Supporting institutions: French Institute of Bioinformatics (IFB), Institut Pasteur (IP)

Partners: 45 partner teams from 10 main institutions/agencies (Anses, BioPark, CEA, CNR-SpF, CNRS, IFB, Inrae, Inserm, IP, IRD)

Budget: €2 M



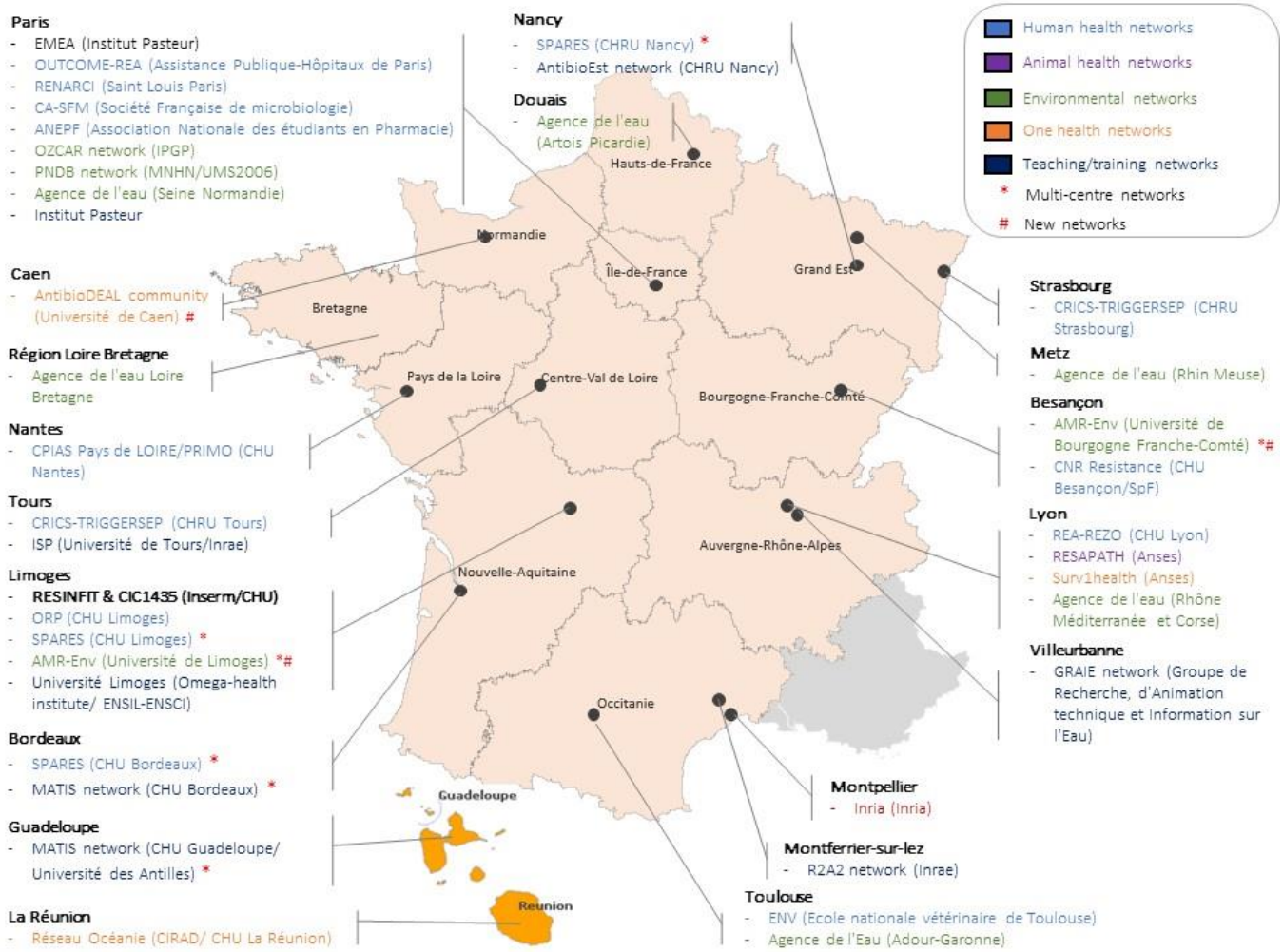
Summary:
Genomics and other omics approaches are essential for research, to improve surveillance of antibiotic resistance from a *One Health* perspective and to develop new therapeutic strategies. The integration and analysis of omics data with associated metadata requires the development of databases accessible to the community, the use of standardised pipelines for the analysis of these data, and the development of new bioinformatics and mathematical methods. This would meet the demands of all actors involved in the problem of antibiotic resistance, such as clinical and veterinary microbiology laboratories, surveillance and public health institutes, and researchers in human, animal and environmental sectors. To meet these ambitious objectives, a multidisciplinary consortium of **43 teams** belonging to the main French research organisations has been established. These teams cover the diversity of research on antimicrobial resistance in the clinical and fundamental fields and gather the skills and expertise in computer science, bioinformatics, databases, computing architecture and mathematical modelling, required to build the **ABRomics-PF** platform.
The development of **ABRomics-PF** is based on 3 technology *work packages* (IT infrastructure, integrated multiomics databases and bioinformatics tools) that will be developed in the context of several specific case studies. **ABRomics-PF** will increase the accessibility of antimicrobial resistance resources and opportunities for data exploitation. This will both enhance surveillance in France and boost research in a holistic, cross-sectoral approach.

PROMISE: Professional community network on antimicrobial resistance

Coordinators: Marie-Cécile PLOY and Bruno FRANÇOIS
Supporting institutions: Inserm UMR 1092, CHU and CIC1435 of Limoges

Partners: 30 existing professional networks, 42 academic partners and 2 new professional networks

Budget: €1.4 M



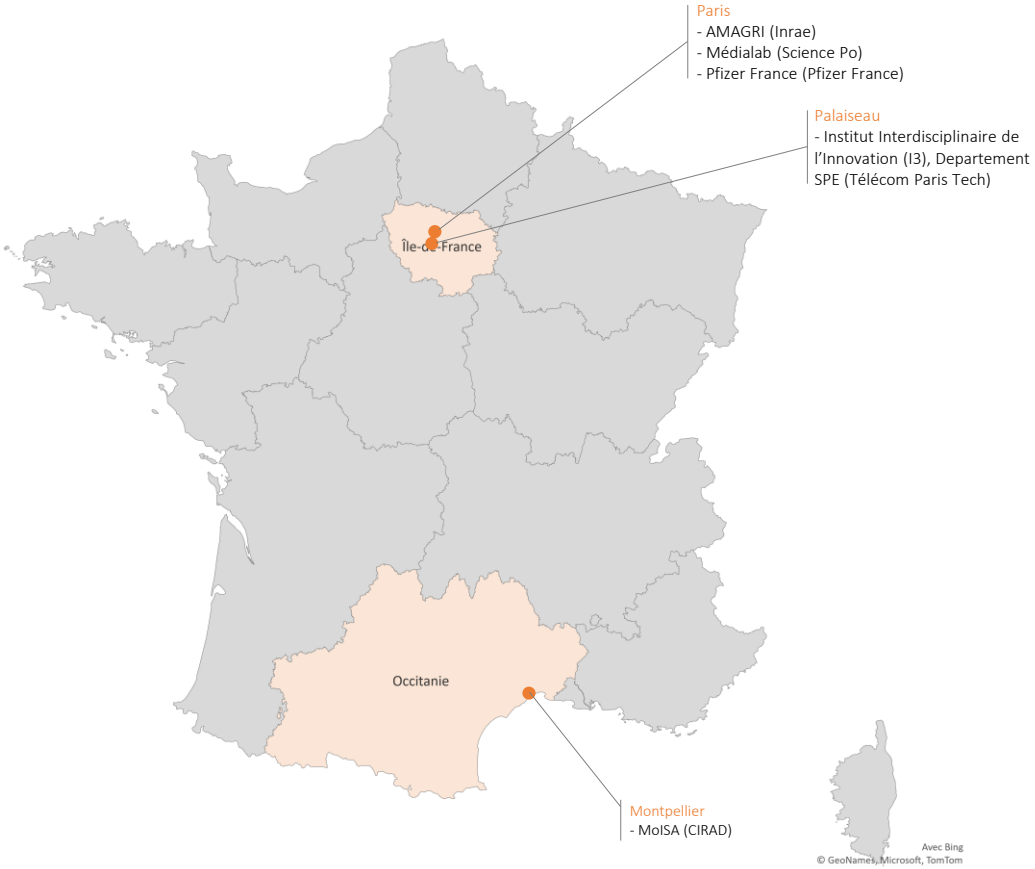
Summary:
As microbes know no borders, antimicrobial resistance (AMR) can move freely from one reservoir to another and cannot be contained within one geographical region or country. The fight against AMR is not limited to the appropriate use of antimicrobials, it includes actions to reduce the negative impact of antimicrobial use on the environment and water quality. A multisectoral *One Health* approach is the only effective mean to limit the emergence of resistance.
By bringing together the main French actors in the AMR field (**21** existing **professional networks** and **42 university research units** in human, animal and environmental sectors)**,** the objective of the **PROMISE** project is to foster synergies by establishing a *One Health* community that will enable networks/academic teams to share best practices and expertise, and to coordinate their actions.
PROMISE's action is based on **4 transdisciplinary and intersectoral pillars:** i) strengthening synergies to improve *One Health* surveillance of antibiotic consumption and AMR, ii) data sharing to improve professionals' knowledge, iii) improving clinical research, iv) European outreach of the meta-network.
To achieve this, **PROMISE** aims to create a **data warehouse** gathering surveillance data from the 3 sectors, which will allow better understanding of the epidemic risk and reinforce the knowledge and skills of the network professionals. **PROMISE** will facilitate the structuring of a **new network dedicated to the environment,** which will collaborate closely with existing networks. Involved professionals are already working on the risk of dissemination of pathogens/AMR in the environment, however, they lack structure. **PROMISE** will also serve as an incubator for the emergence of networks. An **open discussion forum** will allow building bridges between the different scientific communities. Lastly, **PROMISE** will participate in **training and outreach** activities to strengthen *One Health* practices and raise awareness of the problem of AMR.
In summary, **PROMISE** proposes to establish fruitful multi-sectoral collaborations between actors currently working in silos by inviting them to share best practices, expertise and methodologies, to accelerate interdisciplinary and coordinated research on AMR.

DOSA - Digital Observatory of Social dimensions of Antimicrobial resistance

Coordinator: Nicolas FORTANE
Supporting institutions: Inrae CNRS UMR IRISSO, Université Paris-Dauphine

5 partner teams: Sciences Po, Télécom Paris Tech (IDF), Cirad (Montpellier) & Pfizer France

Budget: €600 k



Summary:
DOSA, the Digital Observatory of Social dimensions of Antimicrobial resistance (AMR), aims to provide knowledge on AMR-related practices, discourses and norms. It is now recognised that **social sciences** focusing on AMR must be developed to better identify and evaluate the social, economic and cultural dimensions of antibiotic use and its consequences for human and animal health and the environment. **DOSA** aims to stimulate this dynamic by analysing **sociological and digital data** that have never been apprehended before, in order to structure a network of social science expertise that could engage in interdisciplinary collaborations or with stakeholders. Firstly, strategic intelligence activities and computational analyses of AMR digital spaces will provide essential resources for understanding the socio-economic aspects of the problem and the **technical and scientific controversies** that structure it. By exploring media, scientific arenas, and social networks in all their variety, **DOSA** will produce data capable of capturing the different frameworks and experiences of AMR. Secondly, communication and dissemination activities will make this knowledge available to structure disciplinary and interdisciplinary research communities (fostering interactions between social sciences and biomedical and veterinary sciences) and promote the prudent use of antibiotics among communities (patients, health professionals, industries, etc.).

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