



## **Parkinson's disease research at MetaGenoPolis-INRAE receives 1.5 M\$ from Aligning Science Across Parkinson's**

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MetaGenoPolis-INRAE, center expert in human and animal microbiome research, announces to have been received with other co-investigators new funding from the Aligning Science Across Parkinson's (ASAP) initiative to investigate the role of the microbiome in phenotypic conversion to Parkinson's disease in a genetically susceptible population. This project, named "Genome-Microbiome Axis in the Cause of Parkinson Disease: Mechanistic Insights and Therapeutic Implications from Experimental Models and a Genetically Stratified Patient Population" will involve the scientific and technical expertise of MetaGenoPolis-INRAE in the field of the microbiome.

Parkinson's disease (PD) is a degenerative neurological disease in which dopaminergic neurons of the brain degenerate and then gradually disappear. Mutations in the gene coding for glucocerebrosidase (GBA) are an important risk factor for PD, as 30 % of the carriers develop overt disease. Today it is not known what other genetic or environmental factors may influence GBA mutations to produce Parkinson's disease, but the gut microbiome is among prime candidates, being altered in the disease. This project will investigate the role of the microbiome in the Parkinson's disease focusing on the possibility that GBA mutations and microbiome alterations could act synergistically on the development of Parkinson's disease pathology. It will study well-defined cohorts of patients and healthy carriers of GBA mutations to determine the role of the microbiome in conversion of carriers to Parkinson's disease. Mouth and fecal samples from people with GBA-PD will be used to study first the probable existence of a unique interaction between genetic predisposition and the nature of an individual's gut microbiome to precipitate Parkinson's disease, and to determine if manipulation of the microbiome could reduce the risk and potentially prevent Parkinson's disease onset or progression. Studies with cell cultures and with mice will provide the mechanistic bases for understanding of the process.

Coordinated by Anthony Schapira from University College London (UCL), the consortium builds on existing funded collaborations between UCL, the German Centre for Neurodegenerative Diseases (DZNE) from both Bonn and Tübingen sites and the Mondino Foundation in Pavia (Italia), and introduces MetaGenoPolis at INRAE for microbiome analysis. The MetaGenoPolis-INRAE project team will be led by Hervé Blottière, Ph.D., Scientific director of the functional metagenomics MetaFun platform at MetaGenoPolis, and Stanislav Dusko Ehrlich, Ph.D., Scientific director of the quantitative metagenomics MetaQuant /

InfoBioStat platform at MetaGenoPolis. The MetaGenoPolis-INRAE team will perform all the microbiome studies including metagenomics and bioinformatic analysis on the patient cohorts and animal studies. Their work will inform the further cell and animal studies on specific ligand exposures, based on the data from the patient cohorts. They will supervise integration of the omics with clinics and animal studies.

ASAP is a coordinated research initiative to advance targeted basic research for Parkinson's disease. The Michael J. Fox Foundation is ASAP's implementation partner and issued the grant.

*“This is a fantastic collaborative project gathering scientific authorities in the field, we at INRAE will offer our expertise in microbiome science. It will provide a better understanding of the interactions between the microbiota, the gut and the brain and new weapons to fight Parkinson disease and its progression”* said Hervé Blottière, Ph.D., Scientific director of the functional metagenomics platform at MetaGenoPolis.

*“This is an unprecedented opportunity to understand interactions between a genetic predisposition and microbiome alterations in development of a debilitating and deadly Parkinson disease, thus opening avenues to delay and even prevent its advent”* said Stanislav Dusko Ehrlich, Ph.D., Scientific director of the quantitative metagenomics platform at MetaGenoPolis.

### **About MetaGenoPolis**

MetaGenoPolis (MGP) is an INRAE centre expert in gut microbiome research applied to human and animal health and nutrition, funded by the Programme des Investissements d'Avenir (Laureate 2012 and 2019). MGP's expertise in the analysis of the gut microbiome and its implications for health and nutrition has been widely recognized in the international scientific community since 2010.

In collaboration with industry, academia and clinics, MGP conceives and implements projects tailored to the partner's need. ISO 9001 certified, the protocols and procedures are constantly maintained at the cutting edge of technology. To explore the link between the microbiome, nutrition and health, MGP has innovative technological platforms accompanied by an ethical center UCLy (Catholic University of Lyon).

MGP offers end-to-end microbiome analysis services, including DNA extraction, library preparation, shotgun sequencing, quantitative and functional metagenomics, big data storage and computing facilities, bioinformatics, statistical analysis, and data interpretation.

One of MGP's ambitions is to create, via a citizen science project, a public database of the gut microbiomes of 100,000 French individuals, one of the objectives of which will be to better understand the heterogeneity of the gut microbiome of healthy French people. MGP also aims

to develop more industrial partnerships and the creation of start-ups to accelerate microbiome science and innovation in health and nutrition.



**Links :**

<https://parkinsonsroadmap.org/>

<http://mgps.eu/>