

AgroBRC-211Master 2 project 2024-2025: **Single-cell characterization of host-virus interactions using porcine edited organoids.** GABI, Jouy-en-Josas

INRAE, the French public research organisation dedicated to agricultural, food, and environmental research is one of the world's leading research institutes in these fields. GABI (Génétique Animale et Biologie Intégrative) is a research unit dedicated to animal genetics and integrative biology (<https://gabi.jouy.hub.inrae.fr>).

Organoids are 3D *in vitro* cell cultures that mimic the structure and function of specific organs and are useful for studying several animal traits under the 3Rs (Replacement, Reduction and Refinement) ethical principle. Pig productions are in great need to transition to sustainable agriculture. The pig is also an increasingly important biomedical model. Our laboratory has developed expertise in porcine organoids culture and phenotyping (1,2) and in genome-editing, and is an active member of the “*in vitro* models hub” of the European EuroFAANG research infrastructure project (<https://eurofaang.eu>). We are currently working on the *in vitro* characterization of host response to a main virus affecting pig productions using porcine organoids and cutting-edge genome editing technologies.

The aim of your project will be to characterize the molecular mechanisms of host response at the single-cell level, using gut organoids with a knocked-out viral receptor in comparison to wild-type organoids. You will learn to carry out, analyse and interpret a single-cell RNA-seq experiment at the finest biological level. You will get accustomed to the advantages and limitations of stem cells and organoids for the study of host-pathogen interactions, and with the advanced genome editing tools in use. As a member of our research team you will benefit of the mentorship from experienced researchers in animal cell biology and genomics, access to state-of-the-art facilities and of a supportive and collaborative, internationally embedded environment.

We are looking for a highly motivated and enthusiastic student with a strong interest in genome editing, organoid research and bioinformatics. Please send your CV, a covering letter detailing your research interests and qualifications, and your transcripts to Elisabetta Giuffra (elisabetta.giuffra@inrae.fr) and Giorgia Egidy (giorgia.egidy-maskos@inrae.fr) by November 14th 2024.

References:

1. *Beaumont et al* Intestinal organoids in farm animals *Vet Res.* 2021 doi: [10.1186/s13567-021-00909-x](https://doi.org/10.1186/s13567-021-00909-x)
2. *Blanc et al.* Phenotypic characterization of organoids derived from pig intestine segments. Wageningen Academic Publishers, pp.2097-2100, 2022