

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

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. The pig is also an important biomedical model and pig productions are in great need to transition to sustainable agriculture. 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 data from our single-cell study in progress. 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 bioinformatics, animal cell biology, genomics, access to state-of-the-art resources and of a supportive and collaborative, internationally embedded environment.

We are looking for a highly motivated and enthusiastic student with a background in bioinformatics, and an interest in 3Rs research in animals. 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 2025.

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