

## **The role of maternal microbiota in durably shaping immunity and microbiota composition in the offspring through epigenetic mechanisms**

### **Abstract**

The trillions of commensal microbes colonizing the mammalian body were believed to shape the immune system mainly postnatally as the newborn is colonized. Recently, we showed that unborn mammals are already exposed to signals derived from the MATERNAL microbiota significantly contributing to postnatal immune development. We hypothesize that the maternal microbiota-mediated changes in the offspring immune system are the result of epigenetic modifications. Using a reversible colonization system of pregnant germ-free mice in combination with whole-genome bisulfite sequencing and chromatin immunoprecipitation, I aim to reveal differences in DNA methylation and histone modifications between gestationally colonized and control offspring. Additionally, I will identify microbial metabolites with epigenetic modification potential in maternal milk and test if their administration to pregnant germ-free mice can recapitulate the effects of gestational colonization. Finally, I will establish if the effects of maternal microbiota substantially and permanently alter microbiota composition and incidence for autoimmunity in the offspring.