



## Master project 2024-2025

### Personal Information

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<b>Group</b>	Pediatric Infectious Diseases and Microbiome group

### Project

## Computational genomics

#### Project Title:

Early development and dynamics of nasopharyngeal and gut microbiota in infants during the covid-19 pandemic: a 2-year prospective cohort study"

#### Keywords:

microbiome; microbial genomics; 16S rRNA, children, microbiota

#### Summary:

The human body is colonized by diverse microbial communities (microbiota) involved in modulating crucial aspects of metabolic, immunological and neurological functioning. The first 1000 days of life are a critical time for the shaping and stabilization of the human microbiota, the child's physical and neurocognitive development, and the maturation of the immune system. COVID-19 pandemic lockdown had a significant impact in nasopharyngeal microbiota in older children and adults. This project aims to explore the early development and dynamics of nasopharyngeal and gut microbiota in infants during the covid-19 pandemic. A cohort of infants born at Hospital Sant Joan de Déu (Barcelona, Spain) between December 2019-December 2020 have been recruited and epidemiological, clinical and microbiological variables have been registered. Nasopharyngeal aspirates and fecal samples have been collected at 3-6, 12, and 24 months of age. Changes in microbiota composition will be assessed using Illumina sequencing (16S rRNA gene; V3-V4 region). Alpha and beta-diversity, and differential abundance analyses with ANCOM-BC will be analyzed at ASV-level.

#### References:

<https://pubmed.ncbi.nlm.nih.gov/?term=mu%C3%B1oz-almagro+c&sort=date>

#### Expected skills:

basic concepts of bioinformatics applied to the study of microbial genomics

#### Possibility of funding:

To be discussed

#### Possible continuity with PhD:

To be discussed

#### Comments:

The candidate will join a multidisciplinary group composed of paediatricians, microbiologists and bioinformaticians with extensive

experience in the study of the human microbiome located at the Hospital Sant Joan de Déu in Barcelona. The group belongs to the network of centres of excellence of the CIBER of Epidemiology and Public Health (CIBERESP) and is considered a consolidated research group by the AGAUR. The team has more than 14 active projects on human microbiome. There is the possibility of applying for competitive contracts to carry out the doctoral thesis with the group.