

# THE DEVELOPMENT OF MICROBIOME IN EARLY CHILDHOOD

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## INTRODUCTION



The acquisition and development of the intestinal microbiome is a very dynamic process that likely already begins in utero. However, the major transition of the gut microbiota occurs during birth. Then, the process of stabilization continues for the first 2–3 years after birth. Complex interactions between the mother, the infant, and their environment shape this process.



FACTORS FORMING INFANT'S MICROBIOME

26 %

Infants are born by C-section.

29 %

Children are diagnosed with allergy.

## AIMS

1. Characterise the process of establishment of the intestinal microbiome in infants.
2. Evaluate the impact of the **mode of delivery**, the **diet** and the use of **medicine** and **vaccination** on the development of the infant's gut microbiota.
3. Correlate the gut microbiome profile with **nutrients and bioactive compounds** present in breast milk.
4. Evaluate the impact of the diversity and composition of gut microbiome on the **immune system** development.

## STUDY DESIGN AND METHODS



### WEEK OF SAMPLES COLLECTION

### SAMPLES

- Bucal swabs
- Stool samples
- Breast milk
- Questionnaires



The project is based on samples stemming from **CELSPAC:TNG – IMUNITY** study.

Samples and questionnaires from mothers and infants will be collected after birth, during the 5th, 17th and 24th week of infant's life.

The **microbial profile** will be analysed from stool and buccal samples by 16S rRNA gene sequencing.

**Infant's and mothers diet** will be assessed from questionnaires.

**Nutrients and bioactive compounds** will be quantified from breast milk samples (HPLC, ELISA).

Description of the development of the infant's gut microbiome.

Understanding the impact of the nutrition and environment in The microbial-Immune cross talk in the infant gut.

## EXPECTED OUTCOMES