

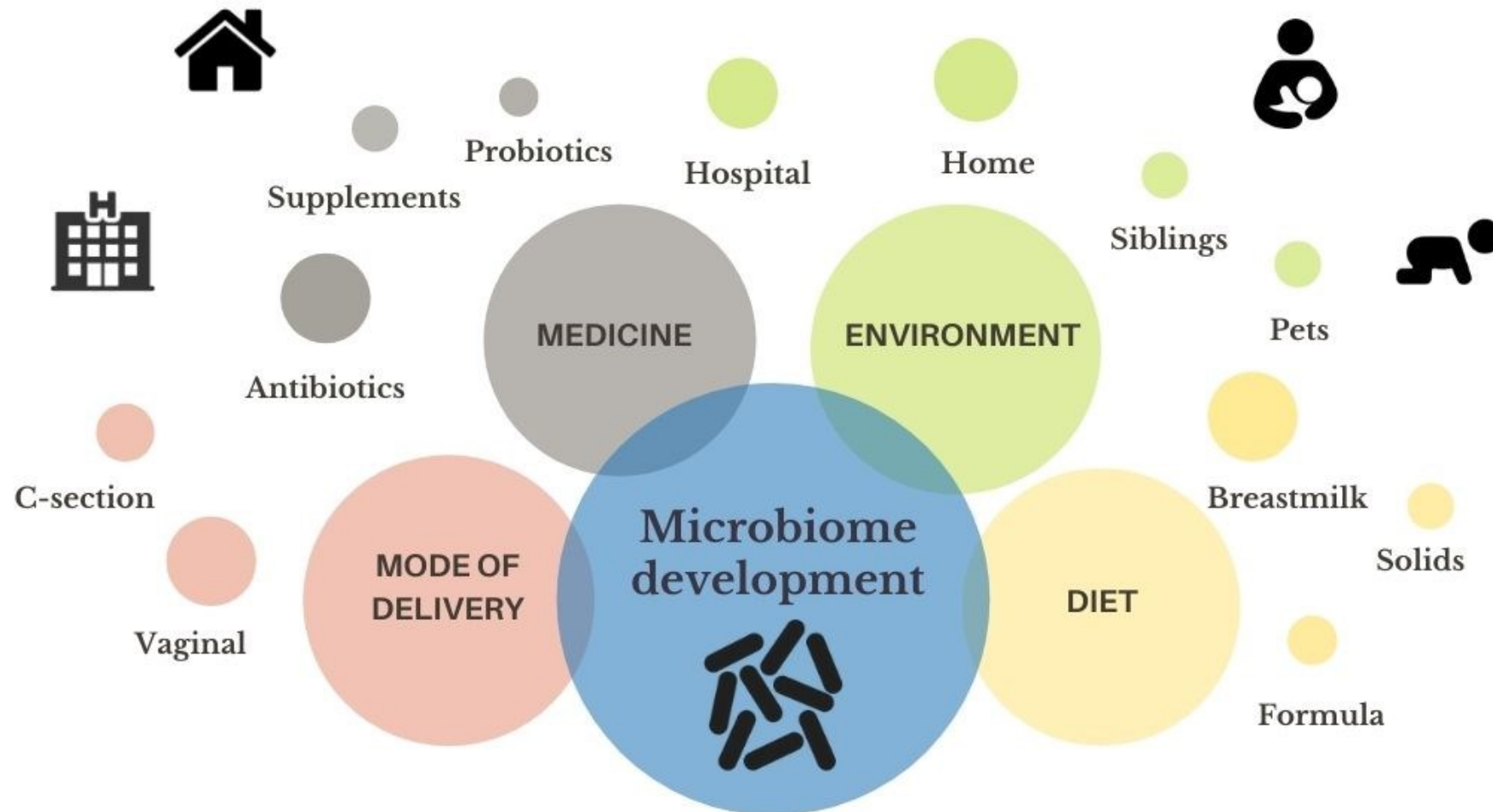


# The metabolomic profiles of infant's stool and milk – project in cooperation with the NMR facility of CeSAR

Eliska Pivrcova



# Environmental exposure influences infant's microbiome





2 Months

4 Months

Breastmilk provides all the energy and nutrients needed by the infant in the first months of life.  
Breastmilk influences the development of the gut microbiome and gut metabolome.



The introduction of complementary foods brings in a variety of new nutrients and food components into the infant's diet.

6 Months

12 Months

Feeding practices during infancy, including breastmilk exclusivity and complementary feeding, have a profound impact on the development of the infant's microbiome and metabolome.



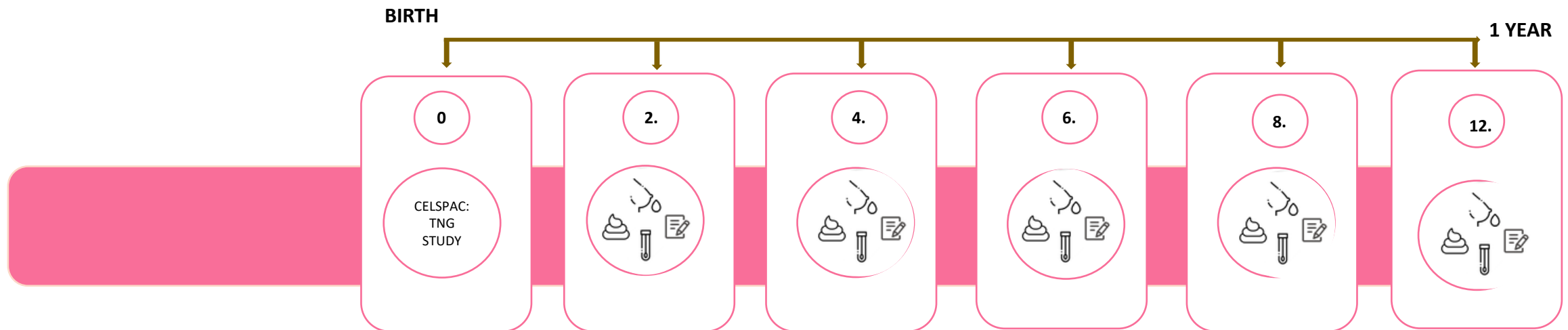
# OMG project

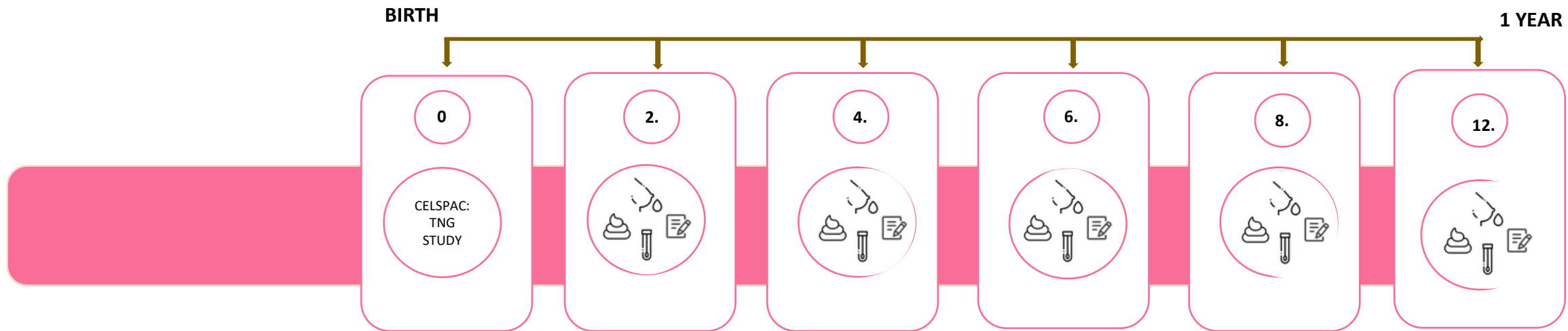
**AIM 1 - characterize the changes in Oral, Milk and Gut microbiome over the first year of the infant's life.**

# OMG project

**AIM 1 - characterize the changes in Oral, Milk and Gut microbiome over the first year of the infant's life.**

- 12 mother-infant pairs
- Collected samples: stool (infant), oral swabs (infant)  
breast milk (mother), oral swabs (mother), and areola swabs (mother)
- 16S rRNA sequencing (Illumina)





# EDUC Share call

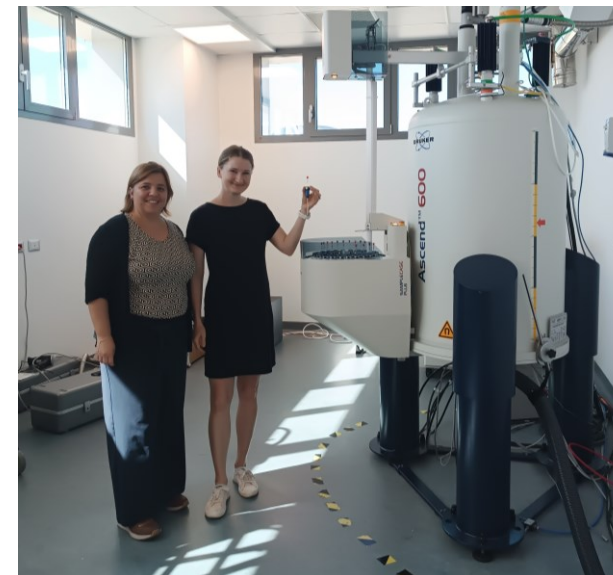
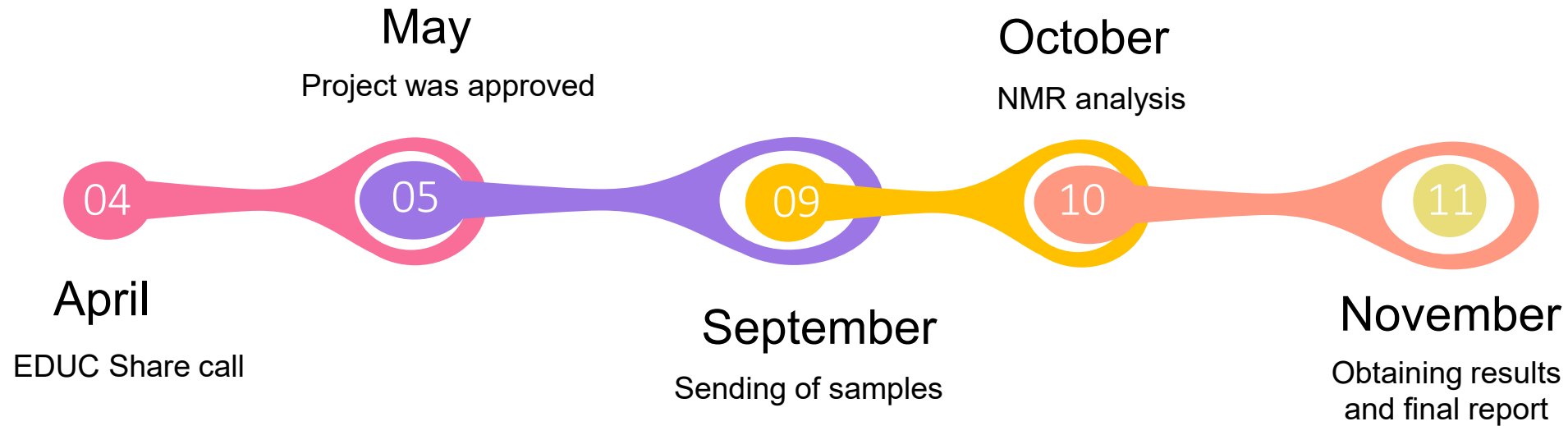


**Aim 2 - describe the infant's stool metabolomic profile over the first year of the infant's life**

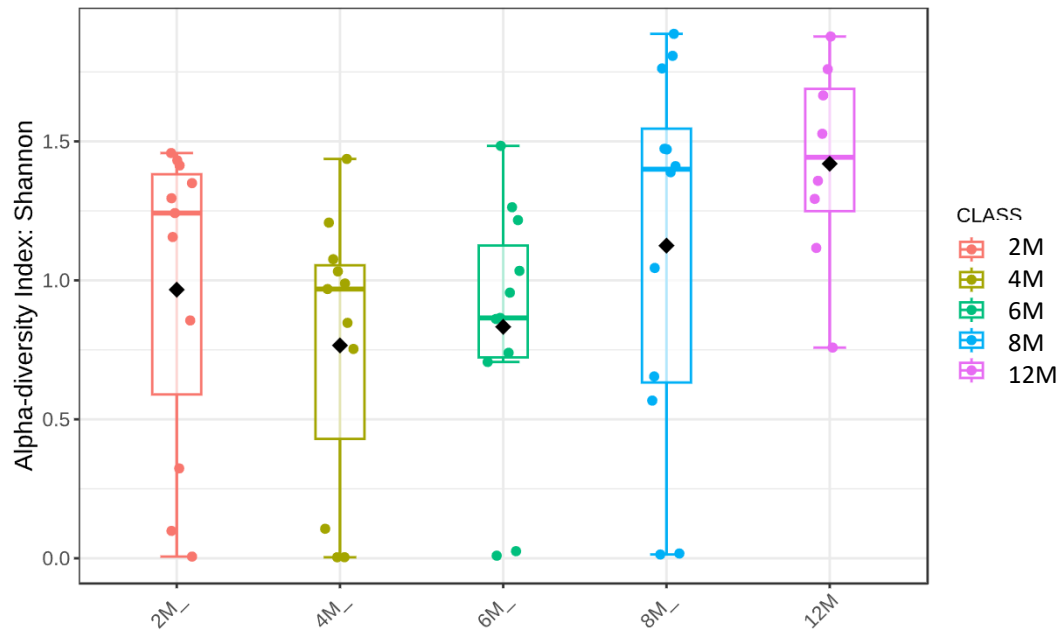
**Aim 3 - characterize the human milk metabolomic profile over the first year of lactation**

- ( $^1\text{H}$ ) nuclear magnetic resonance (NMR) spectroscopy

# EDUC Share – My experience

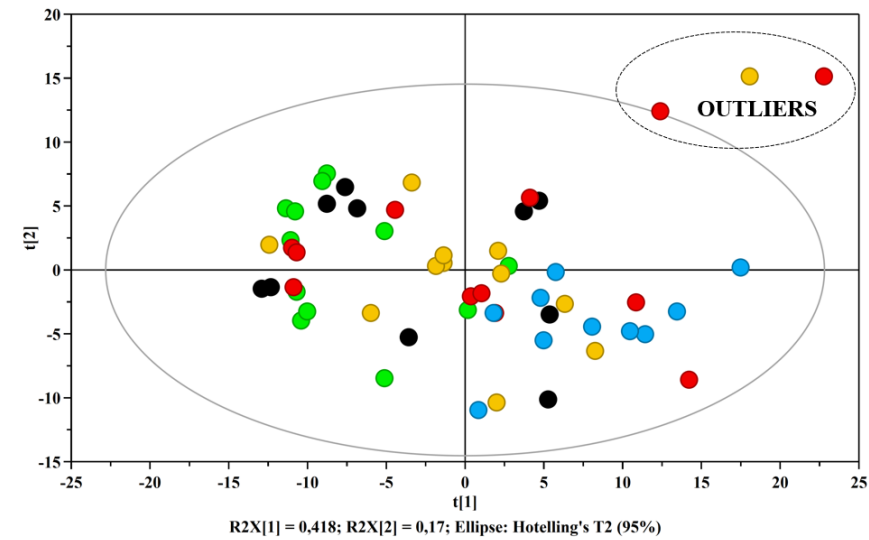


# Preliminary Results – Stool microbiome and metabolome

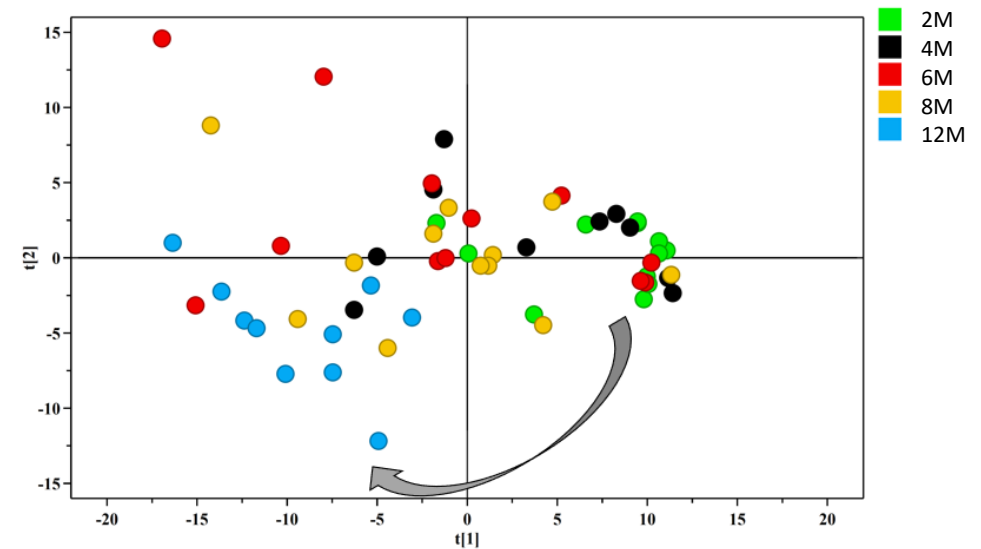


Shannon index of stool samples collected in the first year of an infant's life.

## Principal Component Analysis

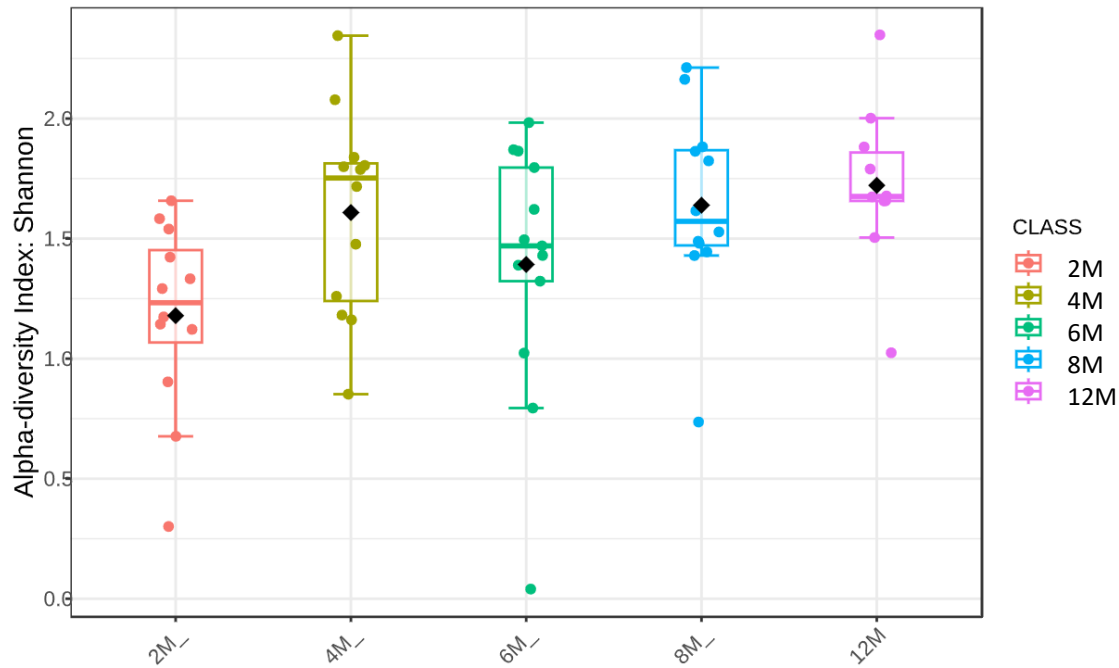


## PLS-DA



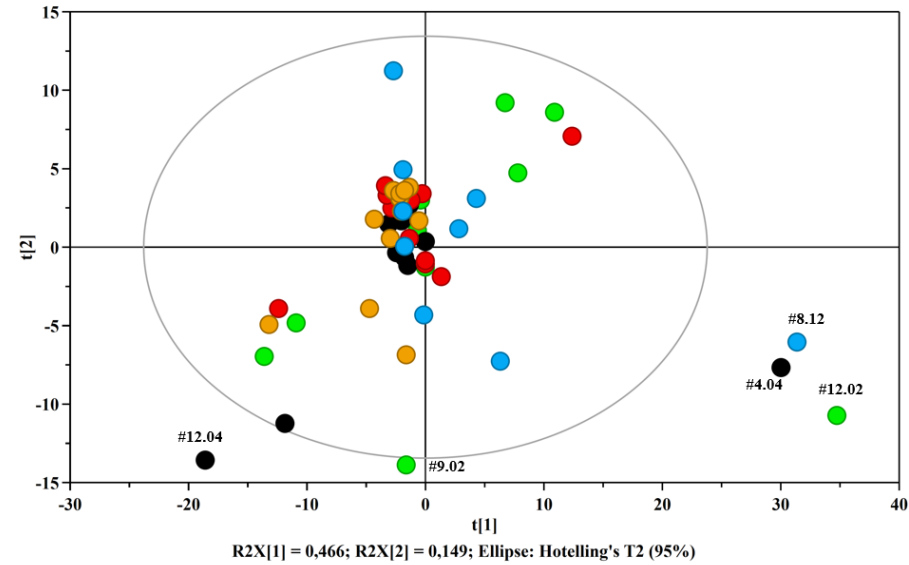
Principal component analysis and Partial Least Squares Discriminant Analysis (PLS-DA) of stool samples collected in one year of an infant's life.

# Preliminary Results – Milk microbiome and metabolome

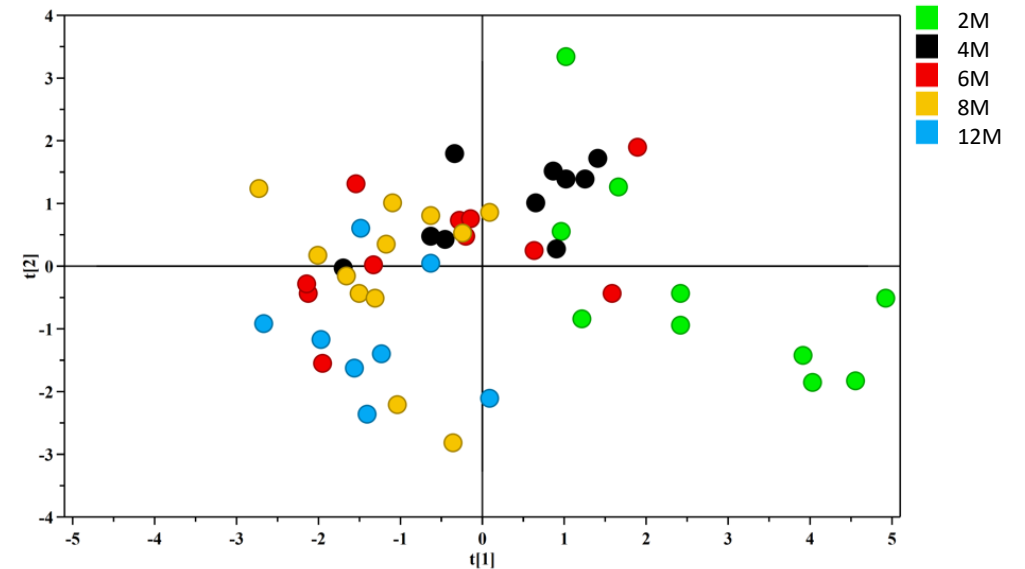


Shannon index of milk samples collected in the first year of an infant's life.

## Principal Component Analysis



## PLS-DA



\* Statistical model built using the VIP value =1

Principal component analysis and Partial Least Squares Discriminant Analysis (PLS-DA) of milk samples collected in one year of an infant's life.

# EDUC-WIDE basic info

- **Partners:**
  - 19 partners = EDUC member universities (incl. Norway and Spain) + additional partners for selected activities
  - coordinated by Masaryk University
- **Budget:**
  - 3,5 mil EUR
  - Lump sum funding
- **From – to:**
  - 1.3.2024 – 28.2.2027
- **Kick-off meeting:**
  - 11-12 March 2024, Brno
  - combined with EDUC Steering Committee

# EDUC-WIDE RI activities

- **2 calls for access (163.000 EUR – experiments + travel costs):**
  - Similar to EDUC-Share
  - In 1st and 2nd half of the project
  - Access provided only by Masaryk University (CZ), University of Pécs (HU) and Precarpatian University (UA)
  - Promotion
    - Facebook campaign
    - Tour of the other universities – presentation of RIs at MUNI, UPécs, PrecarpU
- **Joint workshops (40.000 EUR):**
  - Knowledge exchange projects involving e.g. staff exchange – leaders, researchers, technicians, administrators; organization of joint workshops / seminars; coordinated participation in external trainings
  - At least 2 EDUC Universities, of which at least one must be based in a Widening country

# Thank you

## Acknowledgements

- This work is part of a project that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101017526.
- Part of the work was carried out with the support of RECETOX Research Infrastructure (ID LM2023069, MEYS CR).