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EARLY LIFE SOLID FOOD INGESTION REMODELS THE GUT MICROBIOTA COMPOSTION AND INCREASES THE PRODUCTION OF PROTECTIVE BACTERIAL METABOLITES

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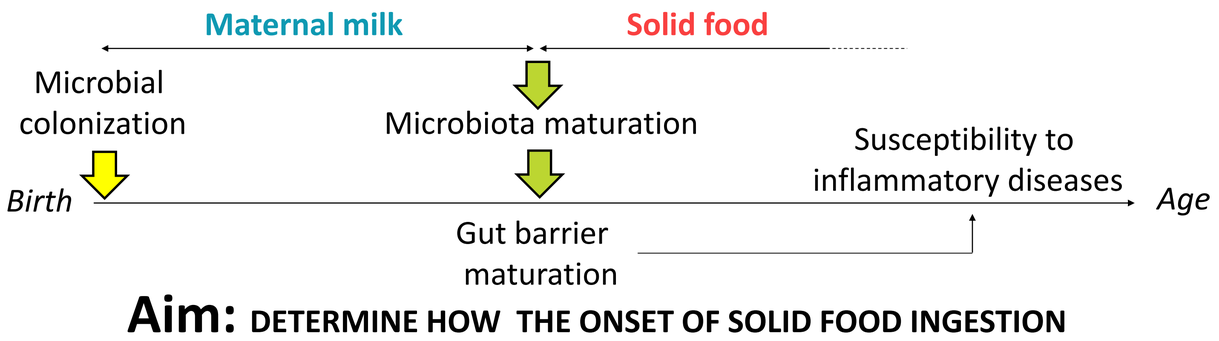
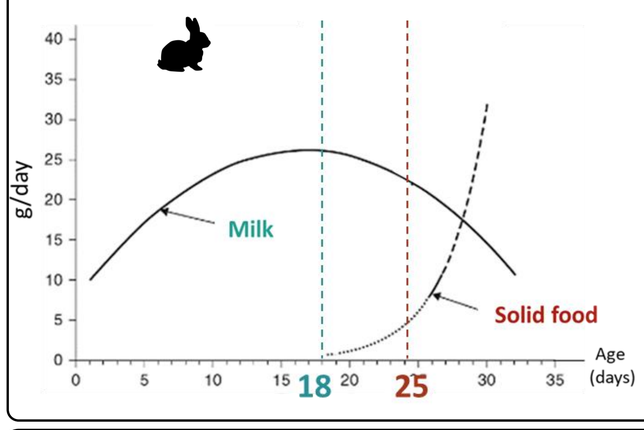
Background



Aim: DETERMINE HOW THE ONSET OF SOLID FOOD INGESTION SHAPES THE MICROBIOTA COMPOSITION AND ITS METABOLIC ACTIVITY IN RELATION WITH THE EPIHTELIAL BARRIER MATURATION

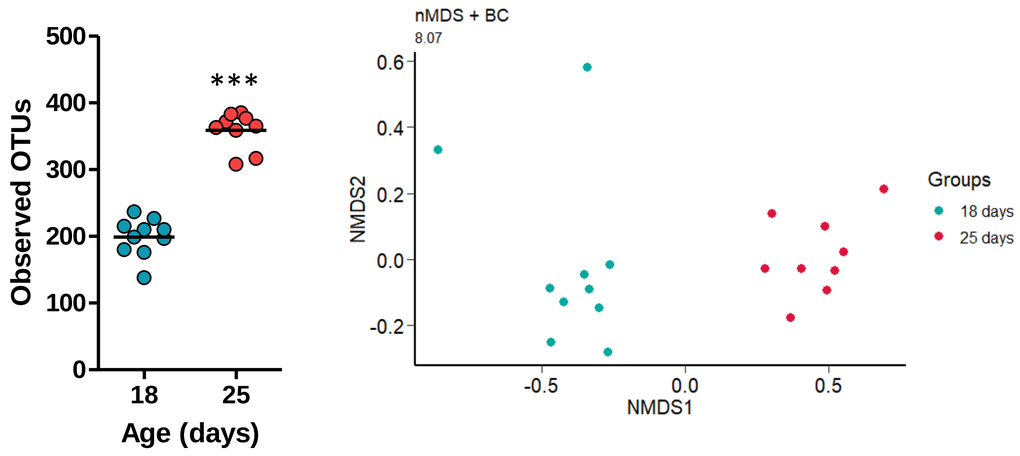
Methods

Neonatal rabbit model

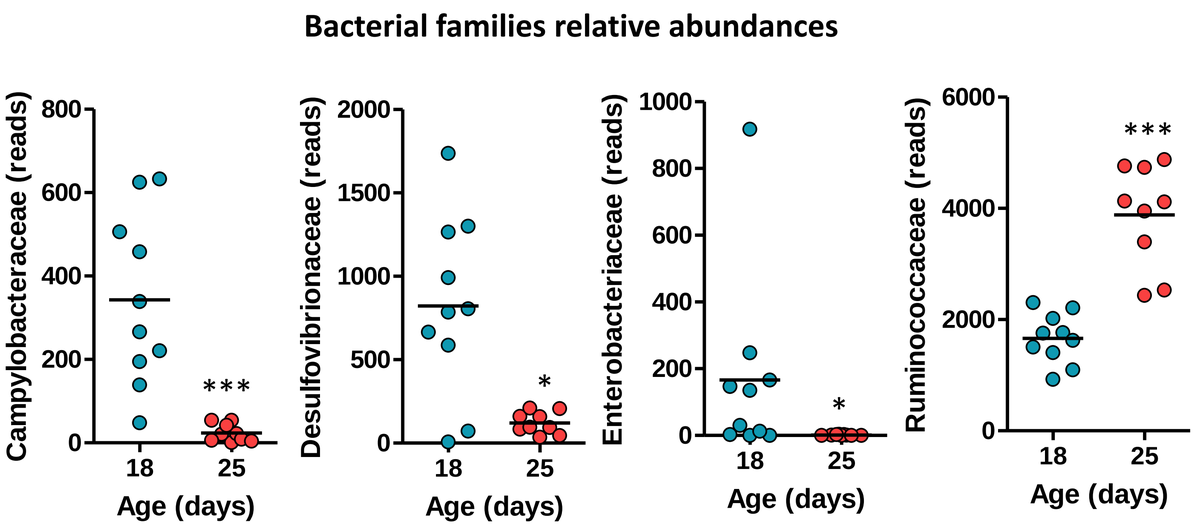


Caecal content → **Microbiota composition** → *16S rRNA gene sequencing*; **Bacterial metabolites** → *NMR metabolomics*

1- Microbiota composition

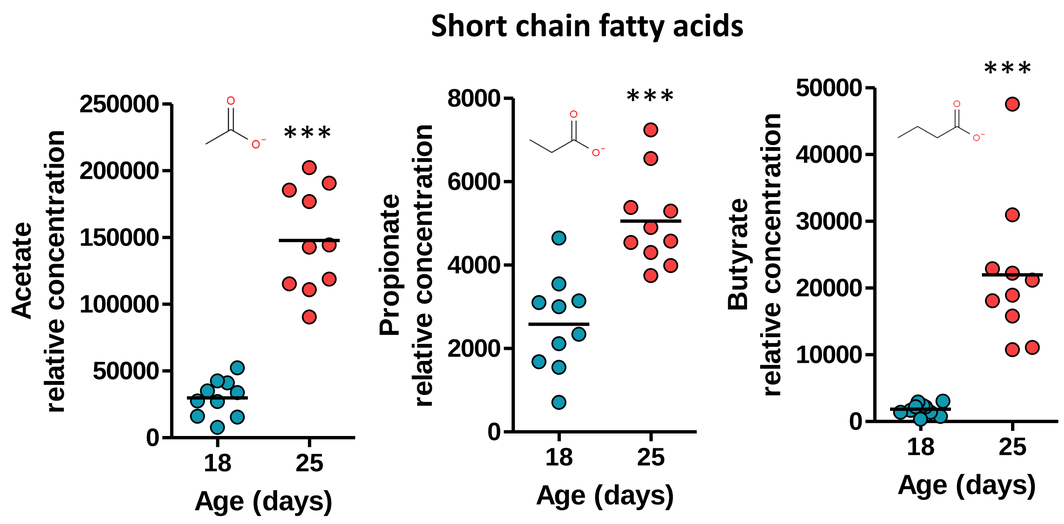


The microbiota composition shifted after the onset of solid food ingestion

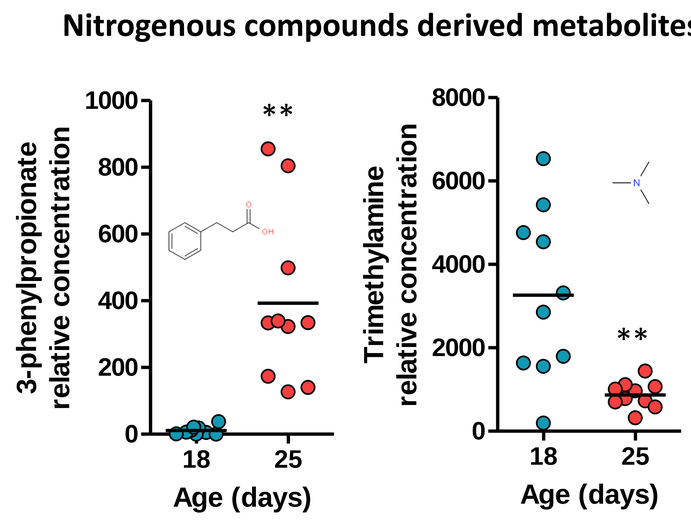


The relative abundance of families including pathobionts decreased after the onset of solid food ingestion while the abundance of a butyrate producing family increased

2- Bacterial metabolites

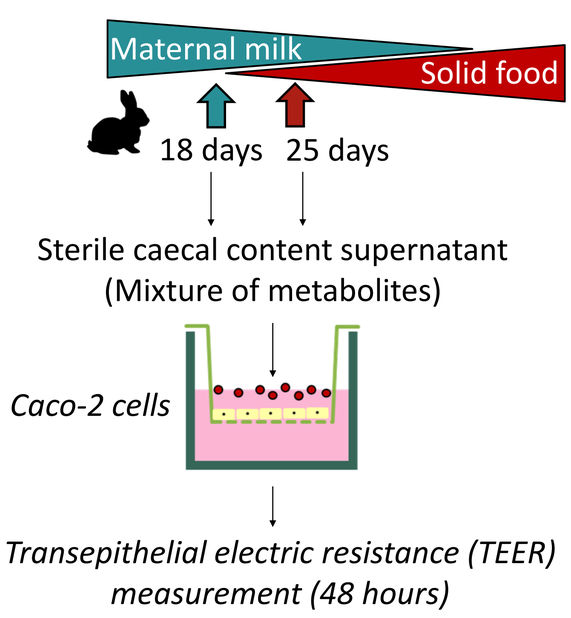


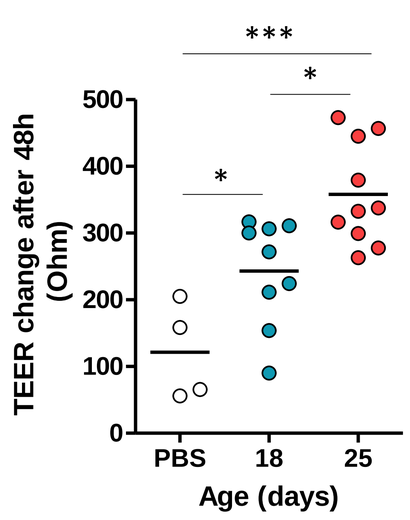
Short chain fatty acids concentrations increased after the onset of solid food



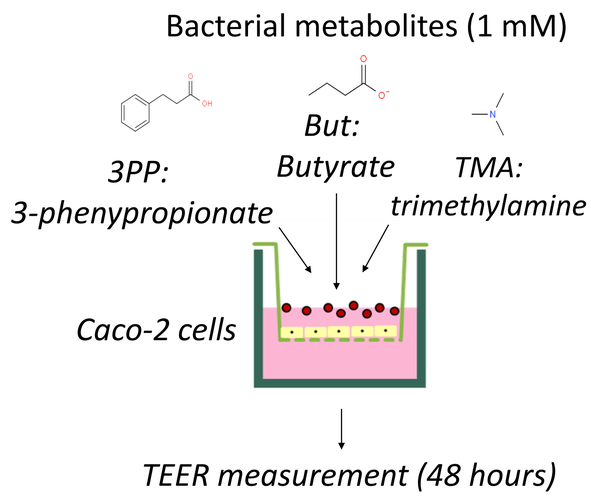
3-phenylpropionate concentration increased after the onset of solid food while trimethylamine concentration decreased

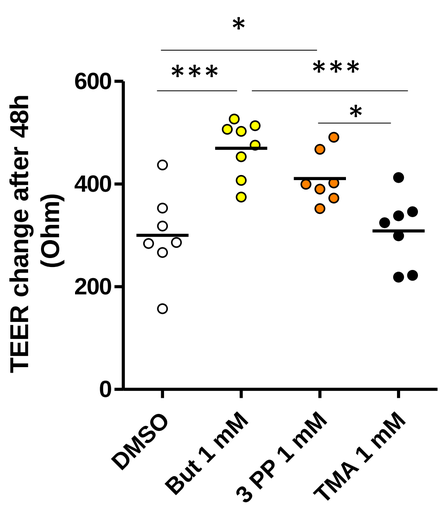
3- Epithelial barrier *in vitro*





The mixture of metabolites produced by the microbiota after the onset of solid food promoted epithelial barrier formation





Butyrate and 3-phenypropionate promoted epithelial barrier formation while trimethylamine had no effect

Conclusion

- The microbiota composition and its metabolic activity shifted after the onset of solid food ingestion
- Since milk intake ingestion was still predominant at 25 days, our results suggest that the introduction of solid food (*versus* weaning) is sufficient to induce microbiota maturation
- Metabolites produced by the gut microbiota after the onset of solid food ingestion might contribute to the postnatal maturation of the epithelial barrier

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