



# Tiny Guts, Big Problems



References



Poster session

## How Can Toxicants From Breast Milk Affect Gut Microbiomes?

### BACKGROUND & CONTEXT

Breast milk provides vital nutrients but can also contain environmental toxicants like PFCs, PFOS, PFOA, DDT, etc. which may disrupt the infant gut microbiome.

Toxicants can produce microbiome dysbiosis associated to obesity and insulin resistance (1). Even though they are unlikely to exceed the recommended tolerable daily intake, they still have an effect on the gut - microbiome of infants and adults (2, 3).



### METHODS

Data on bacterial abundance and toxin concentrations were obtained from Iszatt et al. (2019) (4).

Principal Component Analysis (PCA) was used to identify what bacteria genera contribute most to variation in the gut microbiome.

Redundancy Analysis (RDA) was performed to assess the relationship between toxicant levels and bacterial composition.

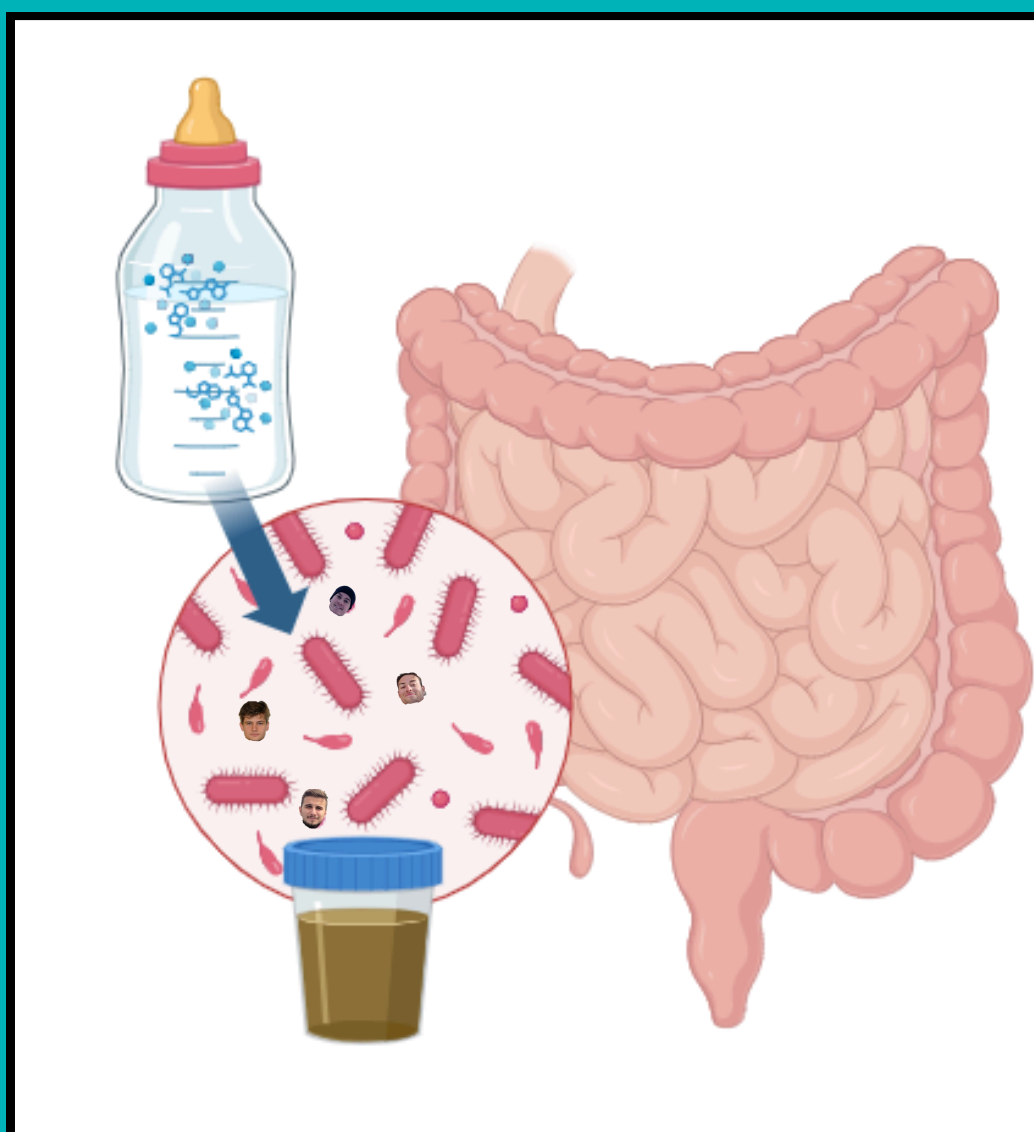


Figure 1: Illustration of an infant gut with bacterial microbiome

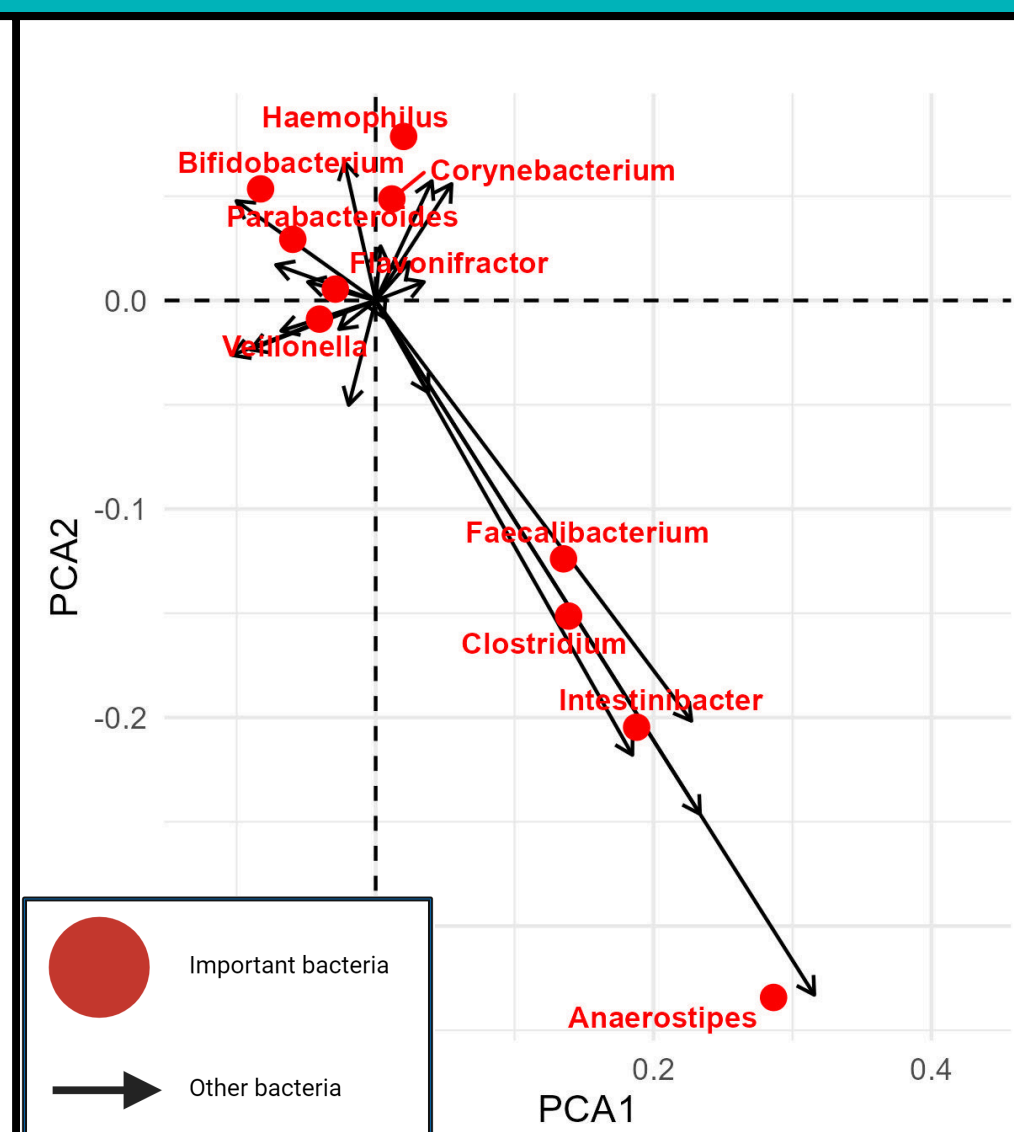


Figure 2: PCA biplot from bacteria dataset. Bacteria along similar axes are correlated.

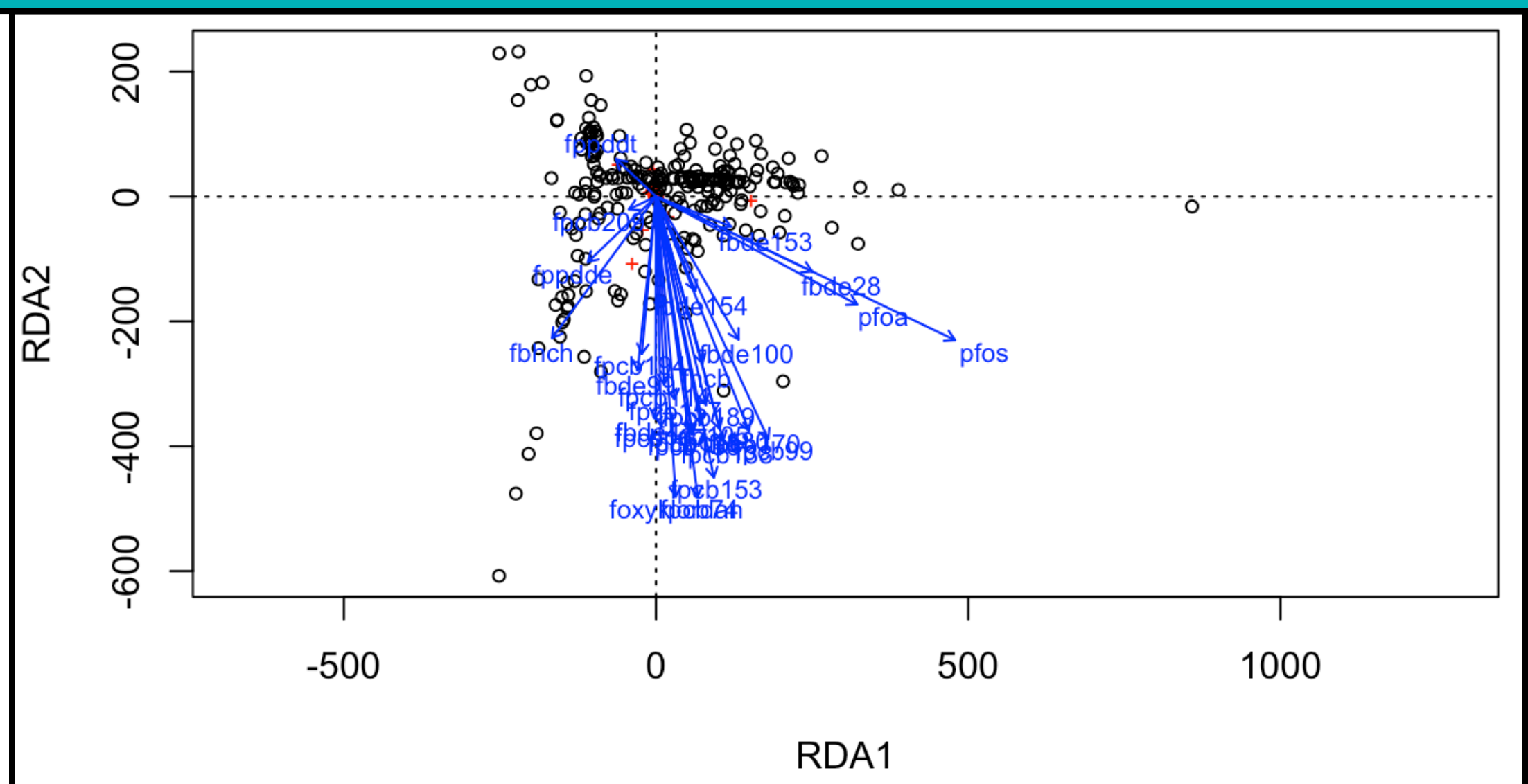


Figure 3: RDA plot. Longer arrows mean the toxicant strongly drives the variance in the community. Arrows pointing in the same direction have a positive relationship.

### RESULTS

Principal Component Analysis (PCA) revealed that *Faecalibacterium*, *Clostridium*, *Intestinibacter*, and *Anaerostipes* were positively correlated, and *Parabacteroides*, *Veillonella*, and *Flavonifractor* were negatively correlated with this group (Figure 2).

Redundancy Analysis (RDA) showed that breast milk toxicants explain 16.7% of variation in infant gut microbiota, with PFOS, PFOA, and PCB153 showing similar effects on bacteria (Figure 3).

### CONCLUSION

Toxicants in breast milk, like PFOS and PFOA, influence infant gut microbiota composition.

Certain bacteria genera often co-occur, others are negatively correlated

These results suggest environmental toxicants may shape early gut health.



Anton Melbye, J Carlos Silas, Sander Sulusnes, Szymon Prusek