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Escherichia/Shigella at 1 month impact epithelial cells which expressed higher calprotectin and cathelicidin

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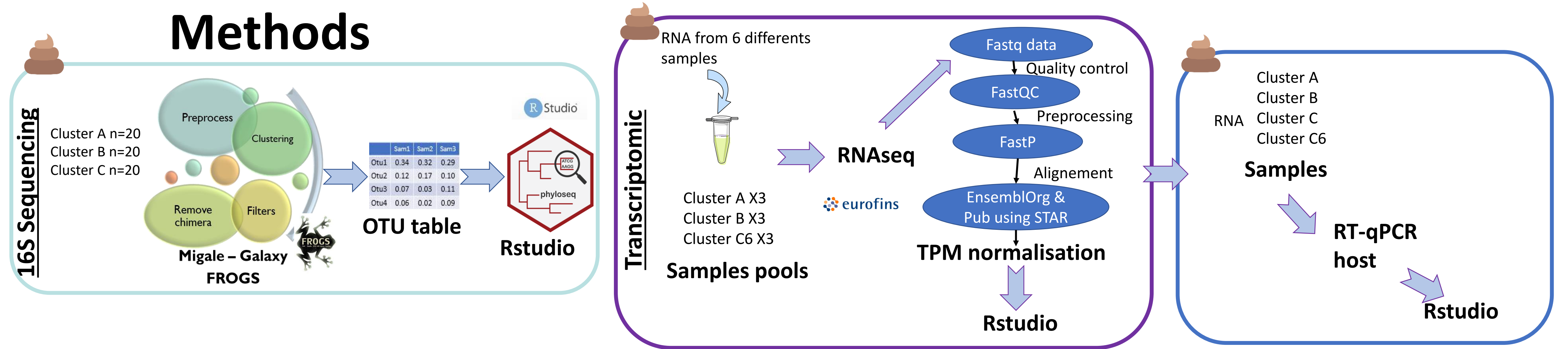
Background

- Preterm birth are 1st cause of death in children under 5 years of age in the world
- Serious psychological and physiological consequences in the short and long term [1]
- High level of fecal calprotectin in healthy infants. Calprotectin is involved in inflammation and is a marker of leucocytes which produces antimicrobial peptides (alpha-defensins and cathelicidin) [2-3]
- Need to develop analyses on non invasive approach

Objective

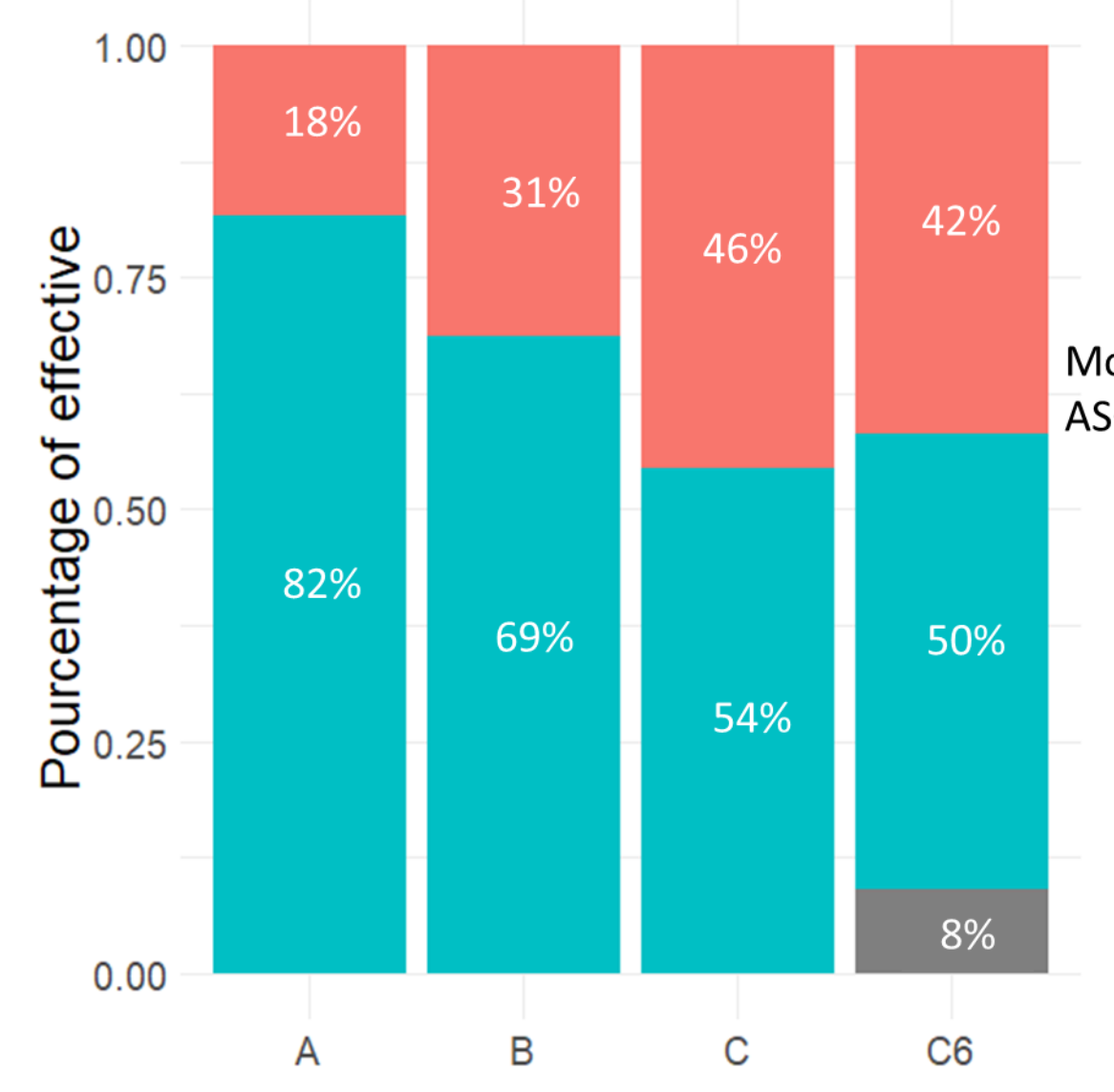
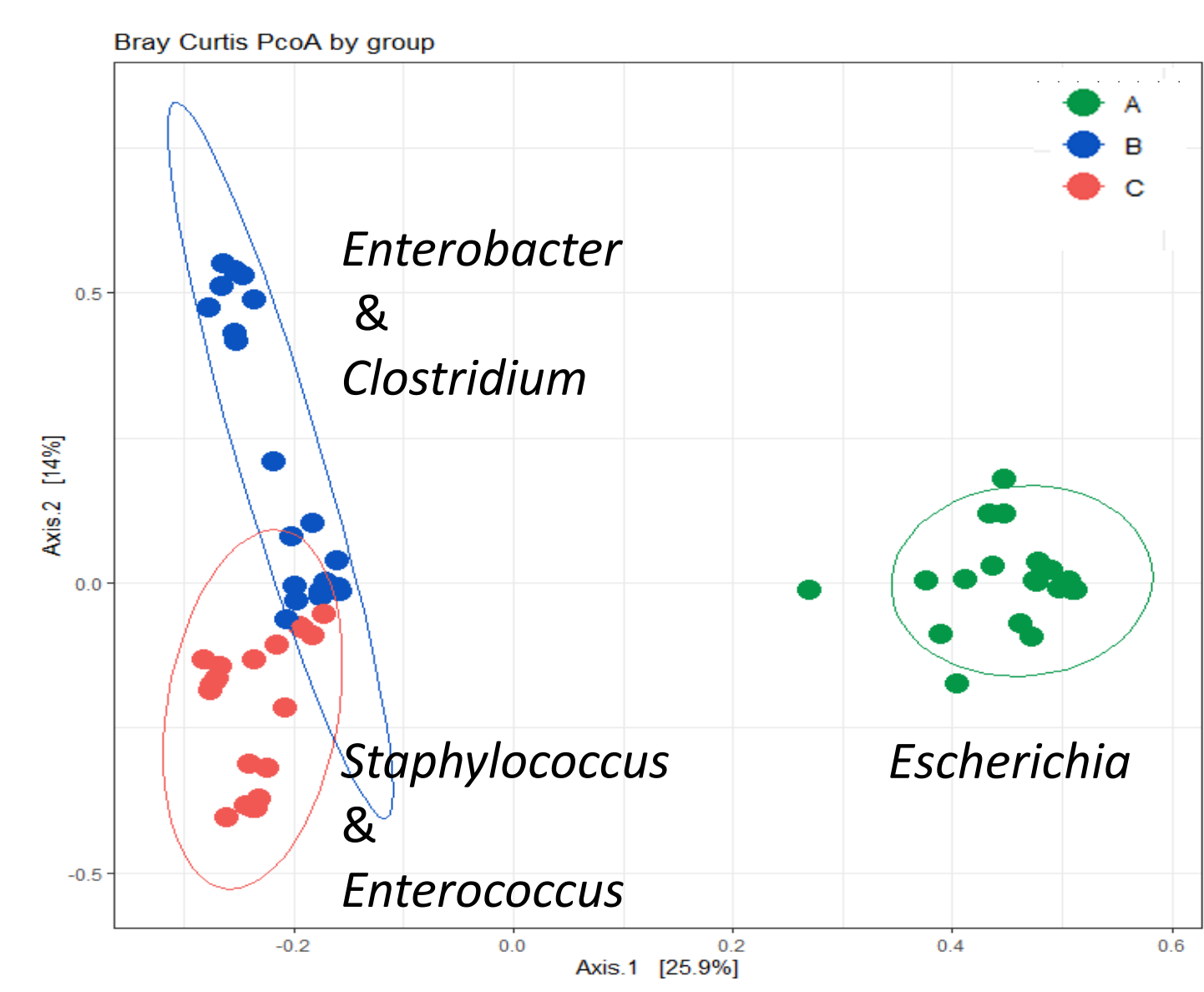
Evaluate impact of gut microbiome colonization at 1 month on calprotectin-mediated physiological inflammation

Methods

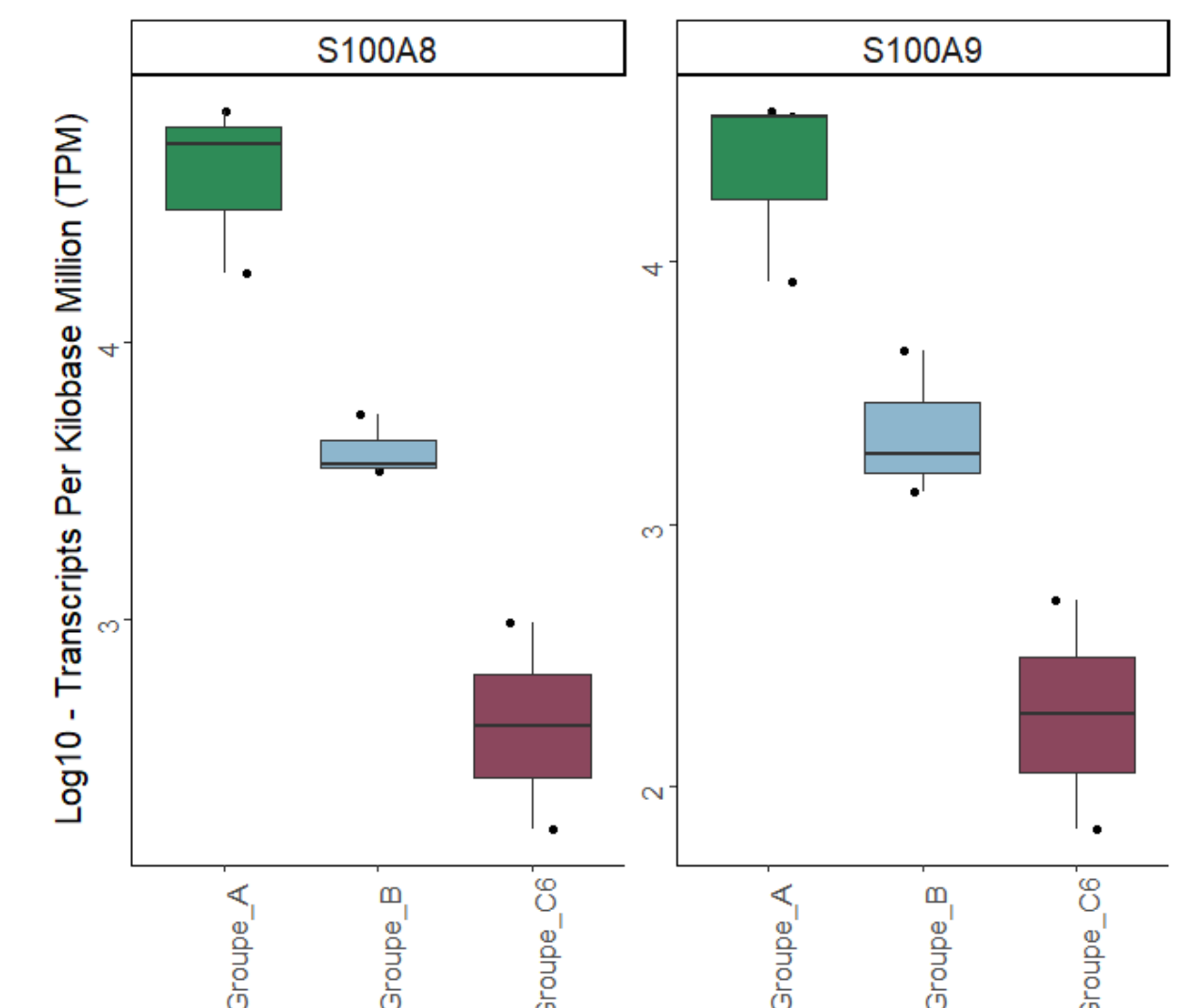
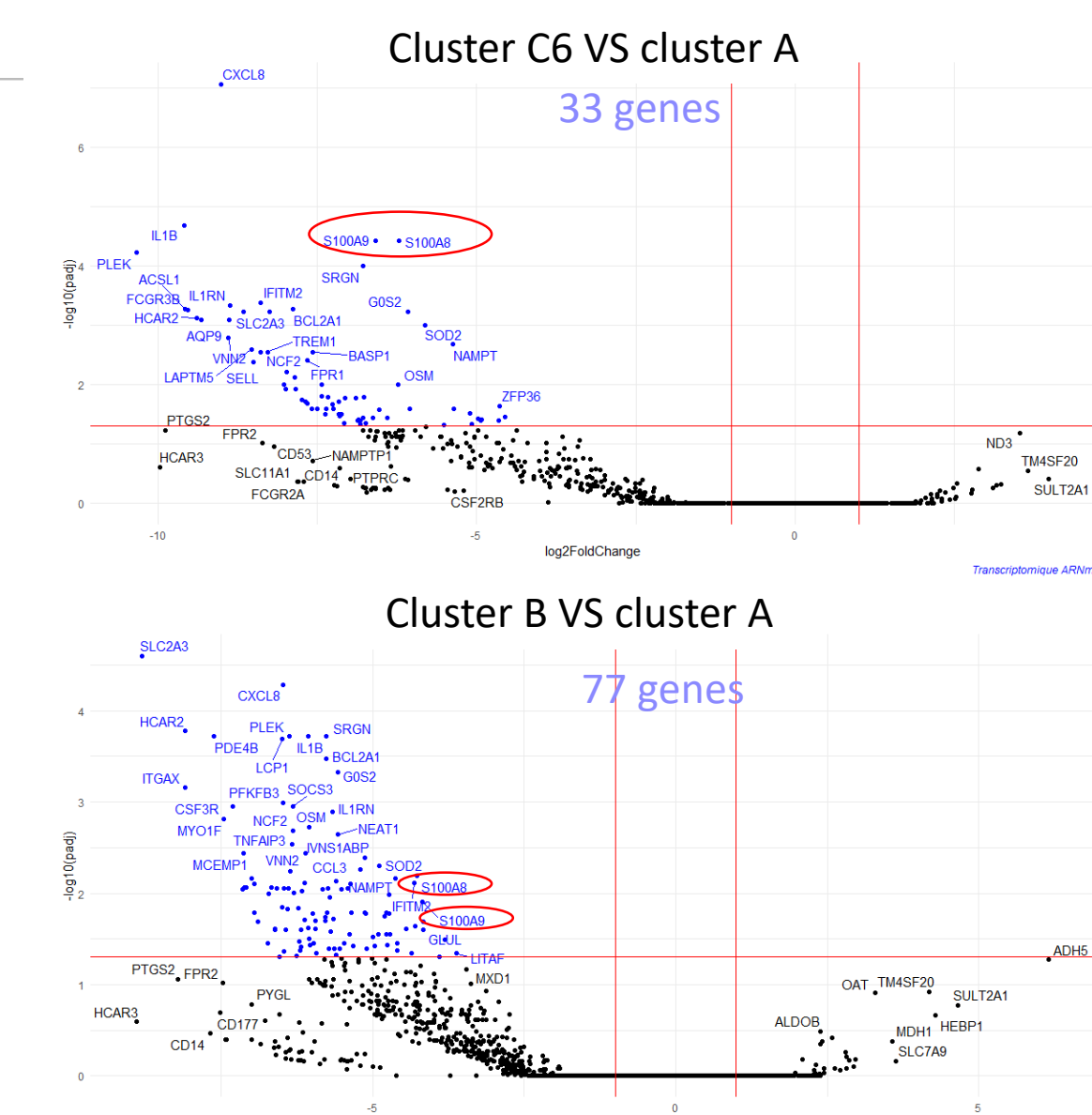
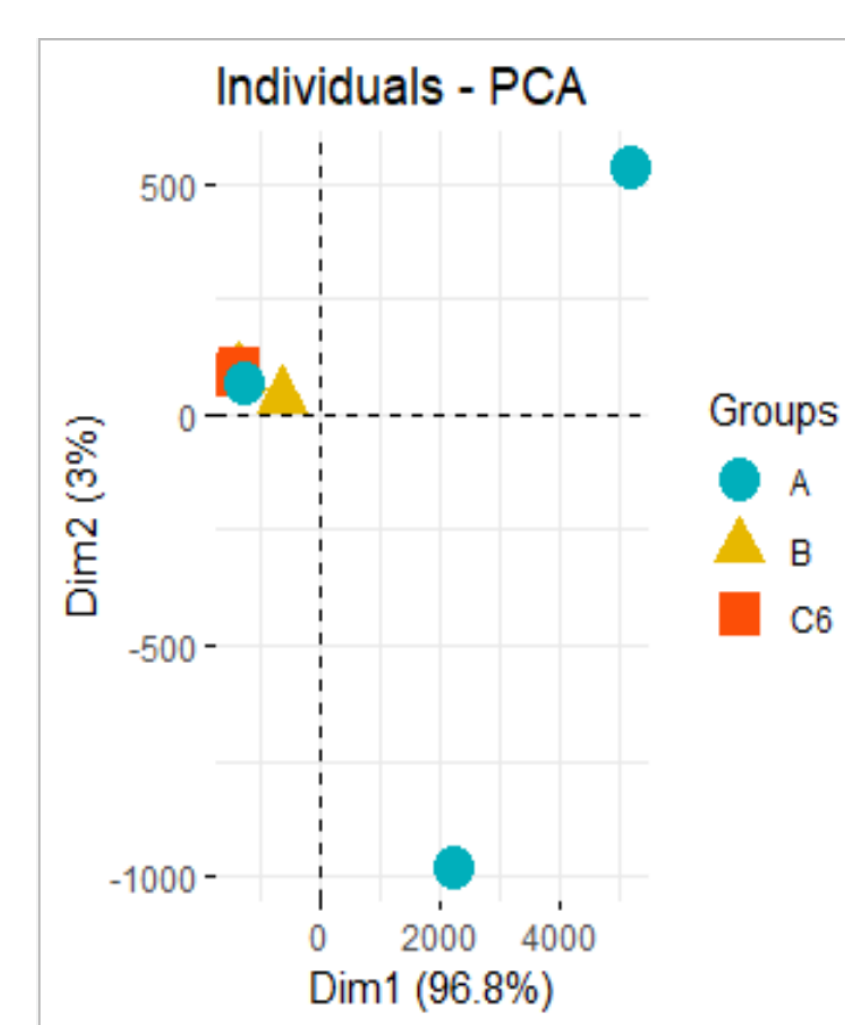


Results

Microbiome of very preterm infants can be stratified in 4 clusters with different outcome



Cluster A genes library have a different gene expression pattern than the other two groups

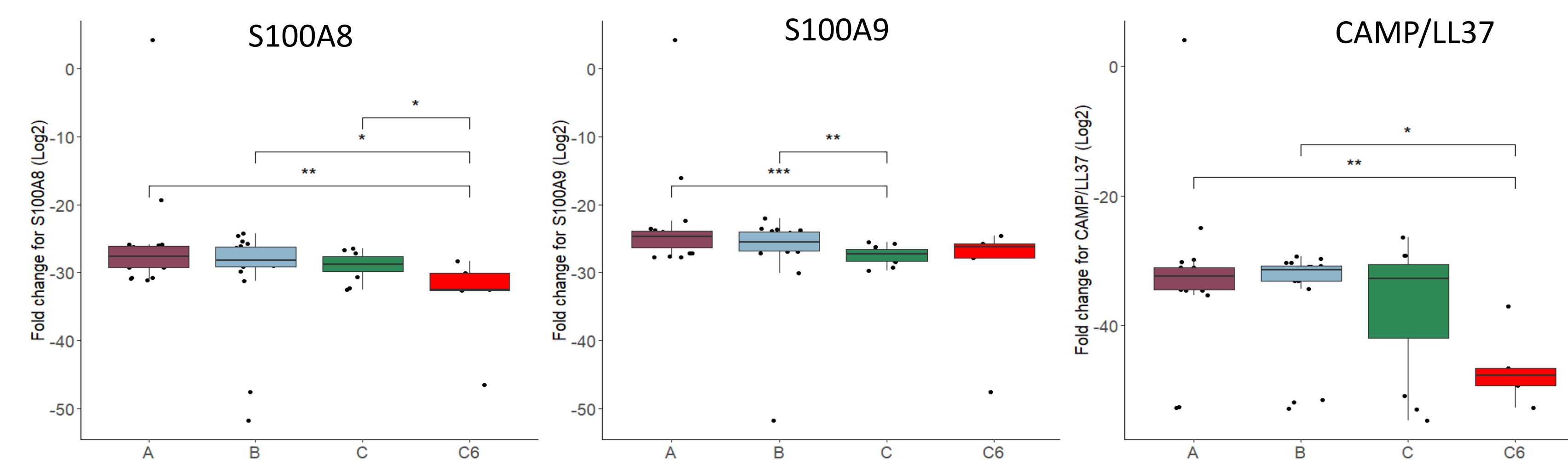


- ✓ Clusters are driven by 3 groups of dominant genus
- ✓ Cluster C6 has a lower abundance of bacteria to be detected
- ✓ Cluster A and B at 1 month have better prognosis at 2 years

- ✓ Up-regulation of many genes for the cluster A against B and C6
- ✓ Calprotectin subunits (S100A8 and S100A9) are up regulated in cluster A.

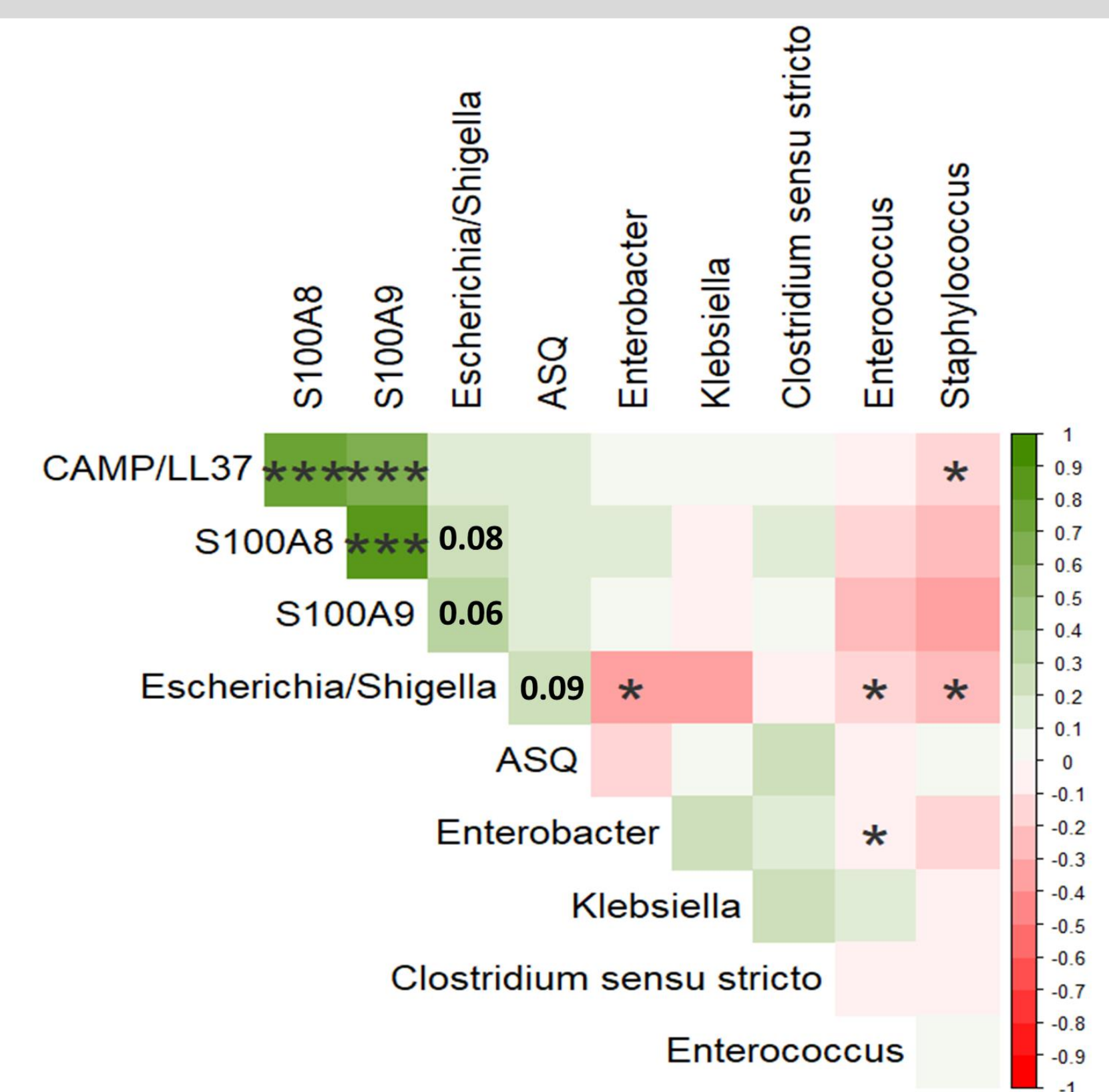
- ✓ An increasing trend is observed for expression of calprotectin in group A.

Expression of calprotectin and cathelicidin globally less expressed in children from cluster C and C6



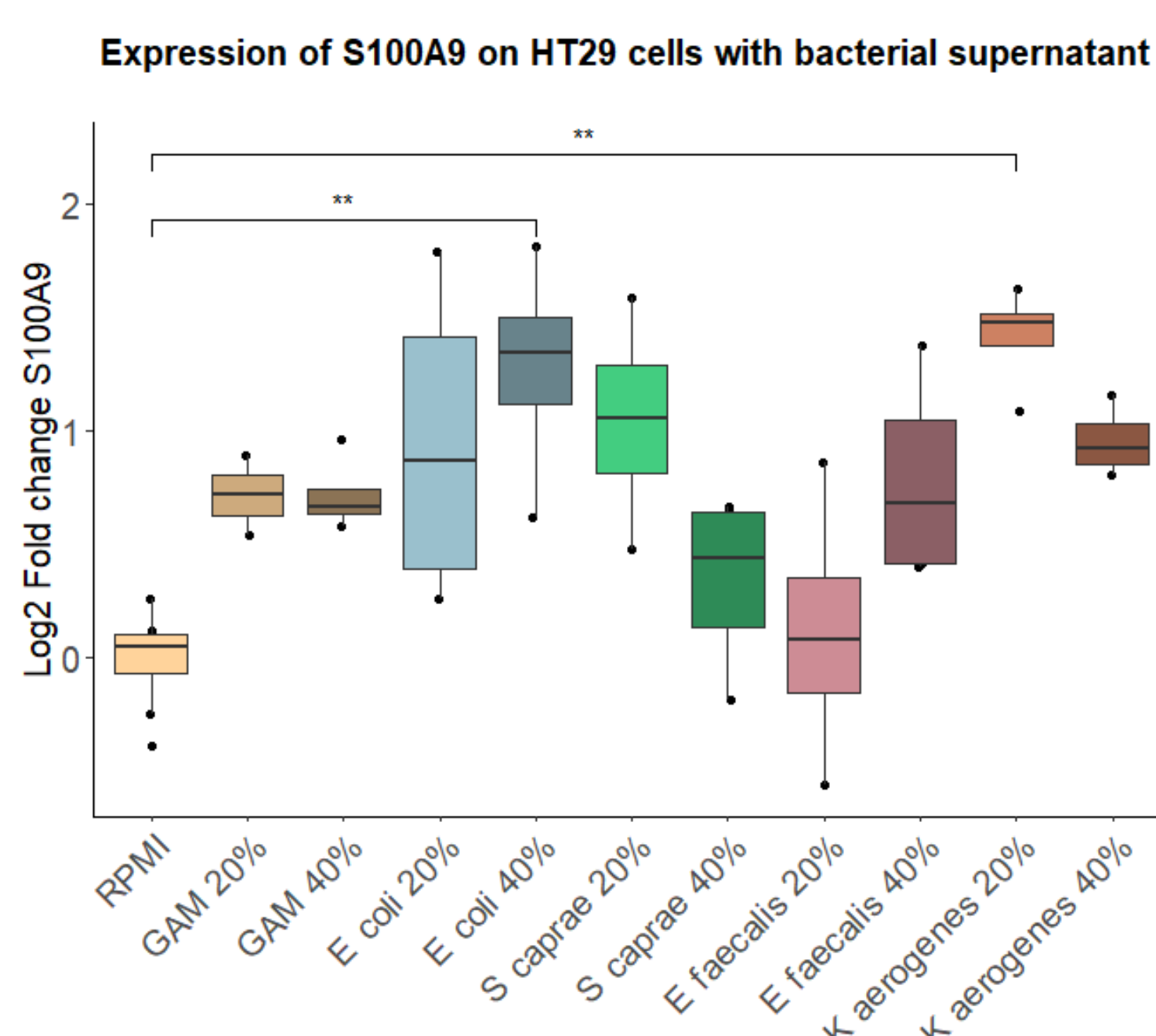
- ✓ Globally, cluster A and B have a higher expression of calprotectin and cathelicidin.
- ✓ Cluster C6, with non detectable bacteria, has the lowest expression for calprotectin and cathelicidin.

Calprotectin and cathelicidin correlated with gut microbiome



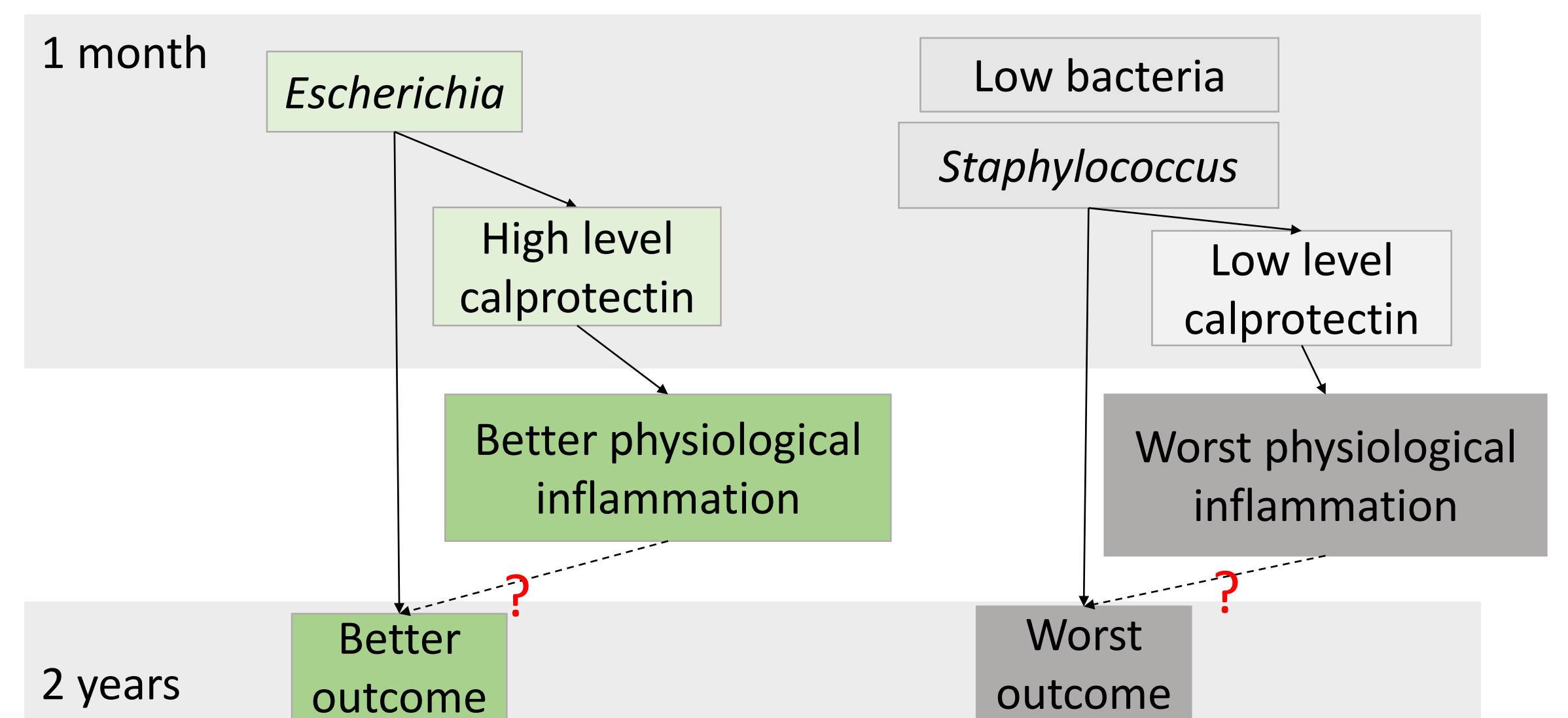
- ✓ Calprotectin and cathelicidin were positively correlated together
- ✓ Cathelicidin is negatively correlated with Staphylococcus (Driver of Cluster C)
- ✓ Escherichia/Shigella and calprotectin were positively correlated (NS)
- ✓ ASQ at 2 years and Escherichia/Shigella were positively correlated (NS)

No real impact of supernatant of bacteria on epithelial HT29 cells



- ✓ S100A8 was not detected in qPCR
- ✓ Escherichia coli and Klebsiella aerogenes increased significantly expression of S100A9

Conclusion



- ✓ Gut microbiome at 1 month impact calprotectin and cathelicidin expression.
- ✓ Having Escherichia at 1 month increased the “physiological inflammation” with calprotectin and cathelicidin.
- ✓ Meconium ? Cells CCD 841 CoN ? Supernatant of isolates ?