

Placental microRNA expression profiles following maternal RSV vaccination (Abrysvo): a small RNA sequencing study

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BACKGROUND & OBJECTIVE

Abrysvo protects neonates through transplacental antibody transfer. A preterm-birth signal in MATISSE raised questions about placental responses. We profiled placental miRNAs after maternal RSV vaccination.

METHODS

Placental samples from 17 vaccinated (Abrysvo) and 15 control pregnancies underwent small RNA sequencing (4 outliers excluded; final: n=13 vs. n=15). Normalized reads: PCA, hierarchical clustering, DESeq2, KEGG/GO enrichment.

RESULTS — GLOBAL PROFILE

PCA and hierarchical clustering clearly separated vaccinated and control placentas, supporting a distinct post-vaccination miRNA signature.

DIFFERENTIAL EXPRESSION

Among 120 differentially expressed miRNAs ($\text{Log}_2\text{FC} \geq 1$, $p < 0.05$), 57 were upregulated, and 63 were downregulated. Top upregulated: hsa-miR-126-5p (angiogenesis) and hsa-miR-376a-3p (immune regulation); top downregulated: hsa-miR-584-5p and hsa-miR-23b-3p.

FUNCTIONAL ENRICHMENT

KEGG implicated cellular senescence, autophagy, Hippo signaling and stem-cell pluripotency. Gene Ontology highlighted histone modification and responses to oxygen levels.

CONCLUSION

Maternal RSV vaccination was associated with a distinct placental miRNA signature involving immunity, angiogenesis and cellular homeostasis. These pathways may help frame the MATISSE preterm-birth signal.

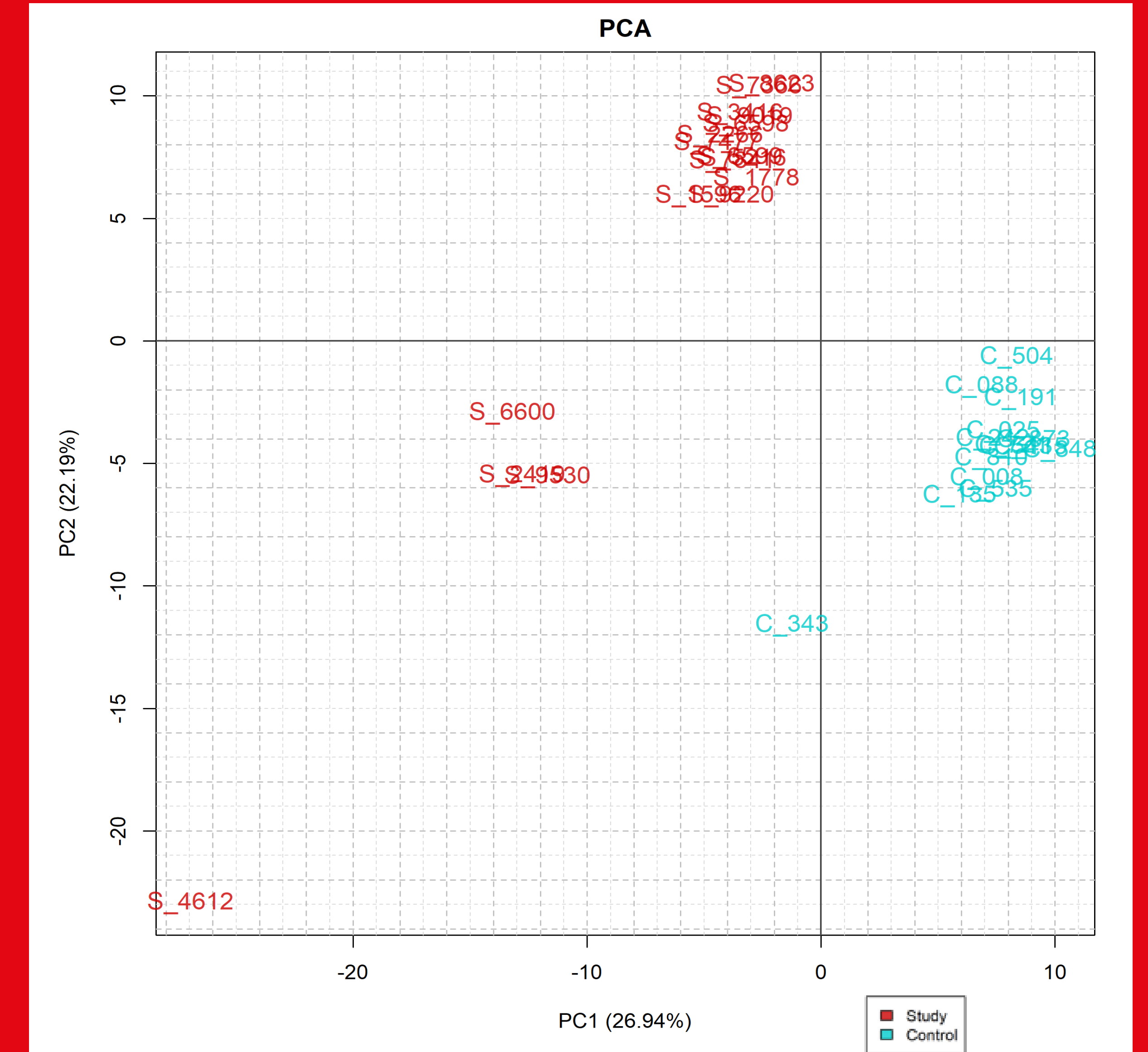


Figure 1. PCA demonstrates separation of vaccinated and control placental miRNA profiles.

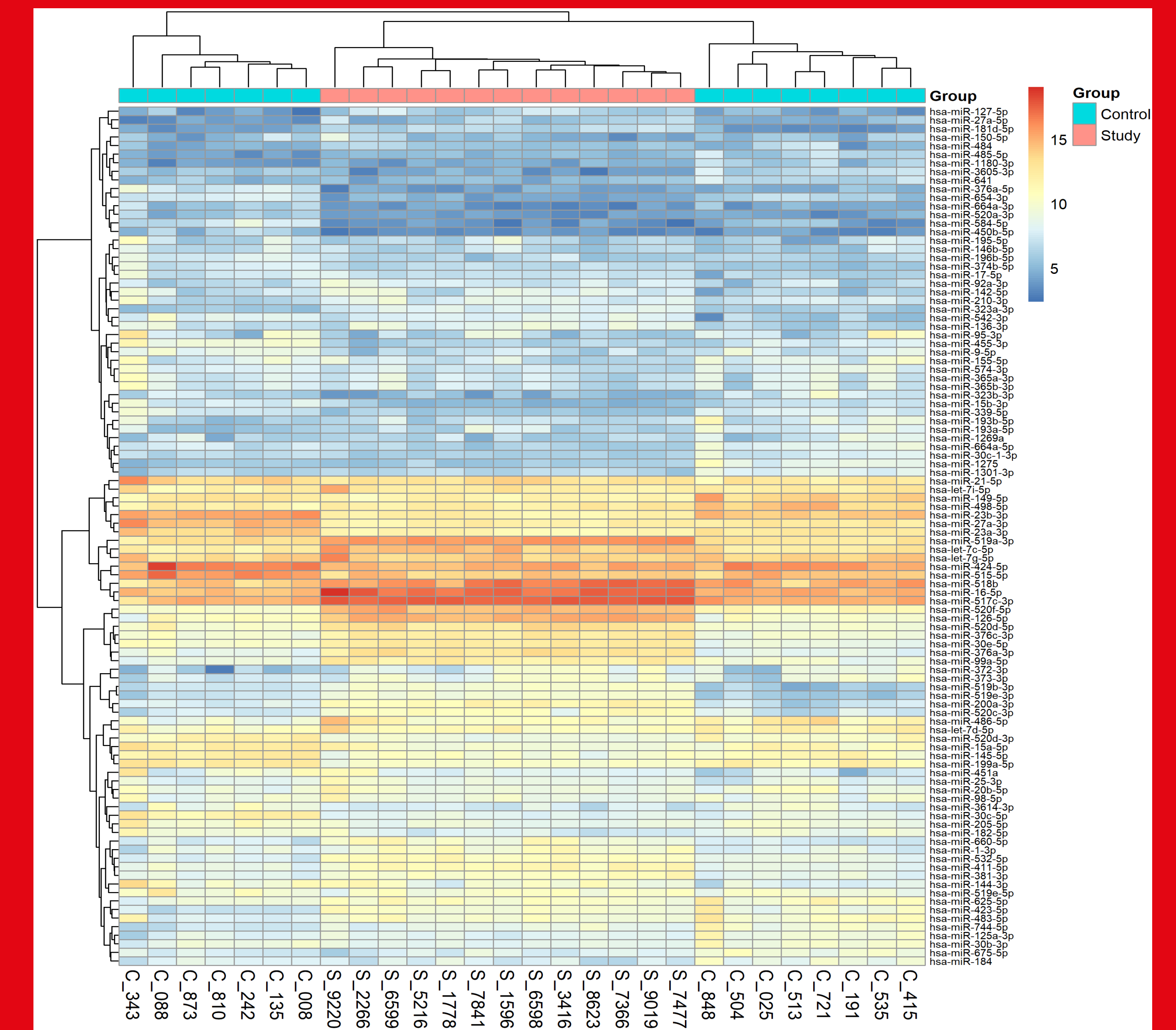


Figure 2. Hierarchical clustering identifies a distinct miRNA expression pattern.