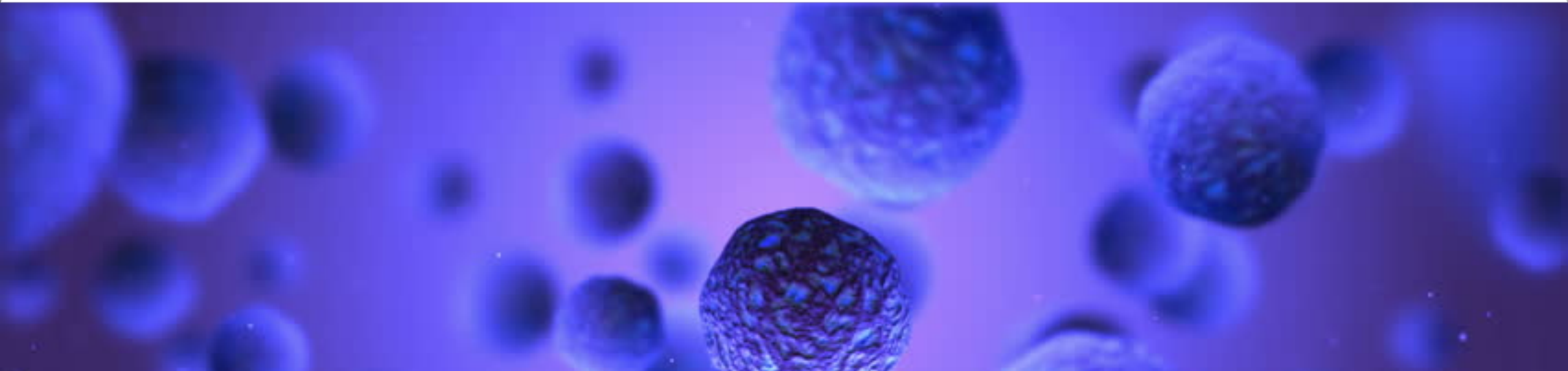


Gene expression profiles of immune cells under the influence of bovine trophoblast cell derived extracellular vesicles

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Embryonic loss is an important problem in the cattle industry

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Embryonic and Early Foetal Losses in Cattle and Other Ruminants

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Teagasc, Animal Production Research Centre, Mellows Campus, Athenry, Co. Galway, Ireland

Embryonic loss is an important problem in the cattle industry

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Review article

Pivotal periods for pregnancy loss during the first trimester of gestation in lactating dairy cows



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Introduction

Embryonic loss is an important problem in the cattle industry

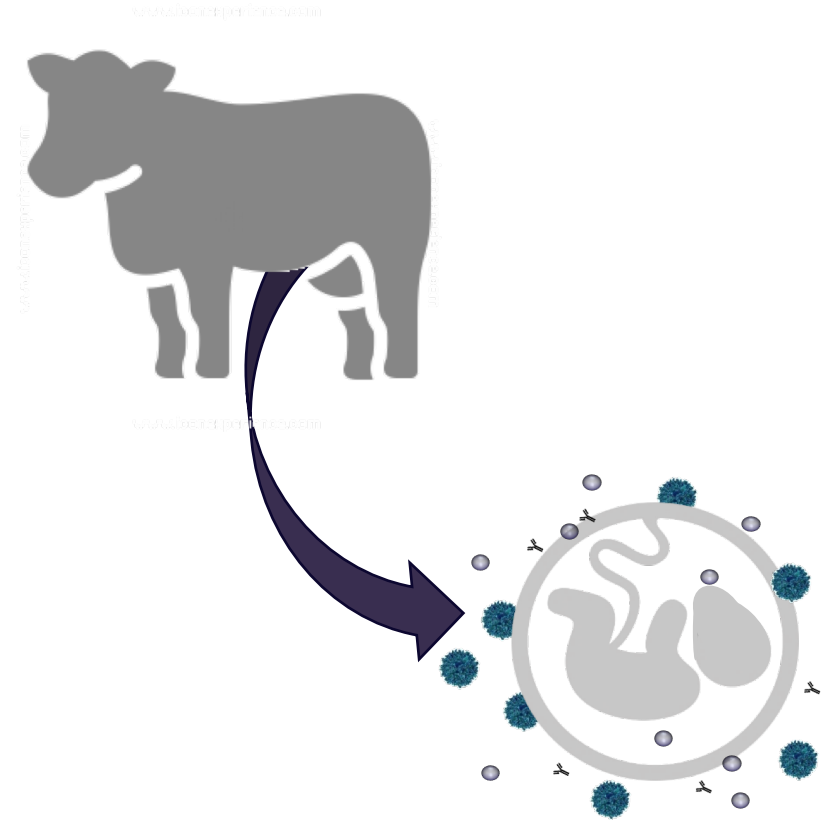
Understanding of mechanisms that regulate placental and embryonic development is relevant to this industry

Immune regulatory interactions between placental and maternal immune cells

Fetal-maternal cross-talk



Release and uptake of EVs



Introduction

Embryonic loss is an important problem in the cattle industry

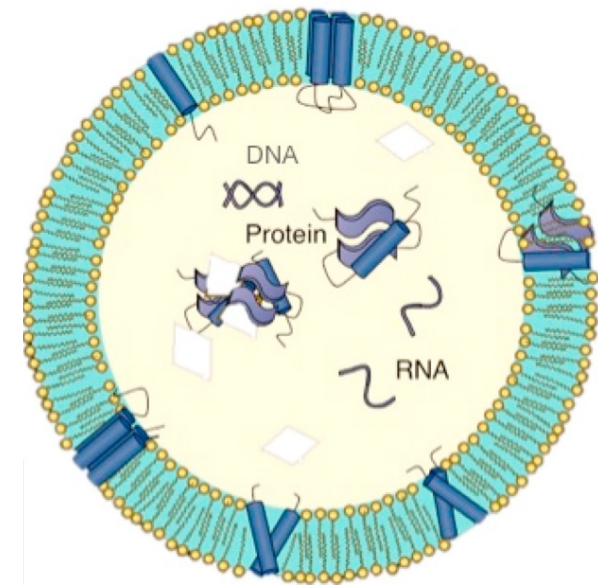
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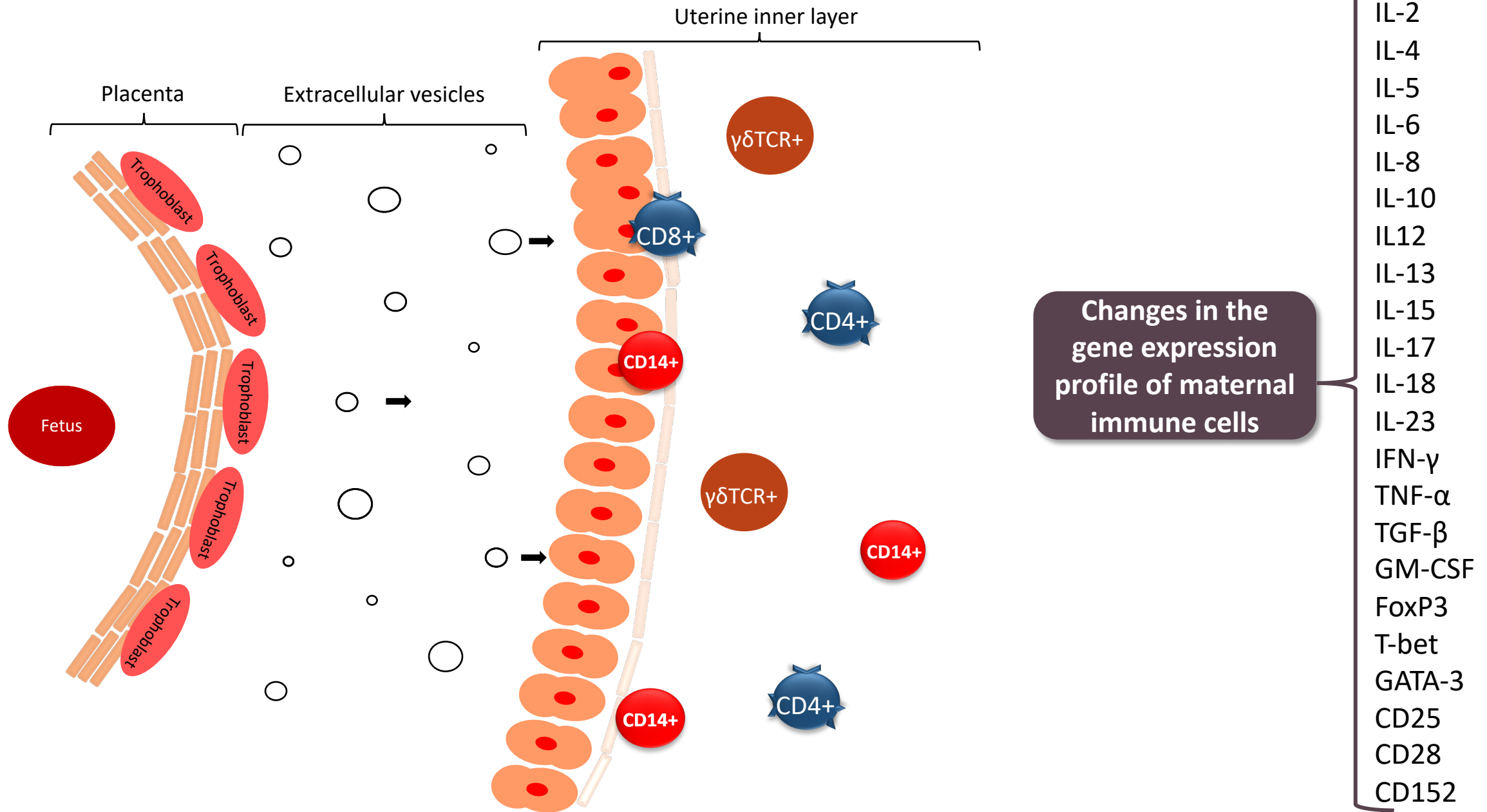


Release and uptake of EVs

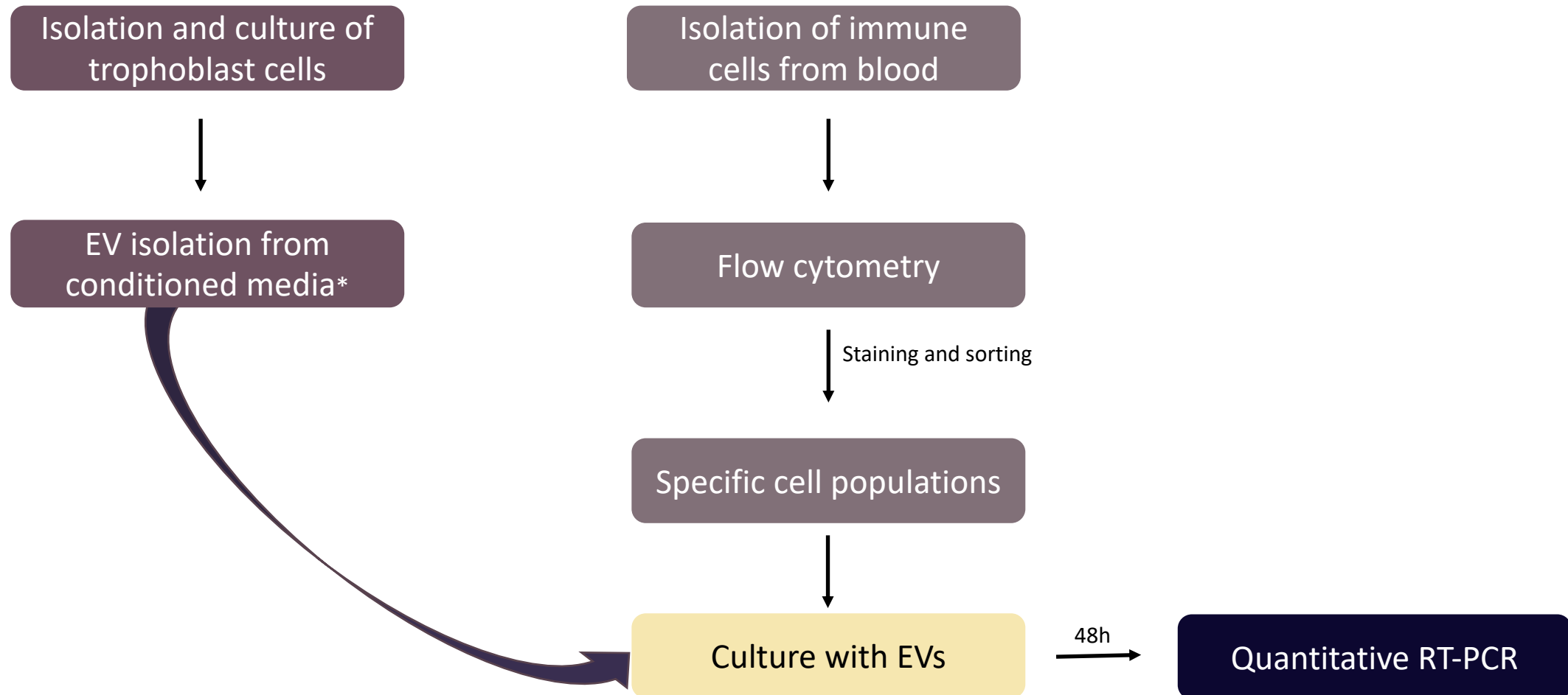


Extracellular vesicle*

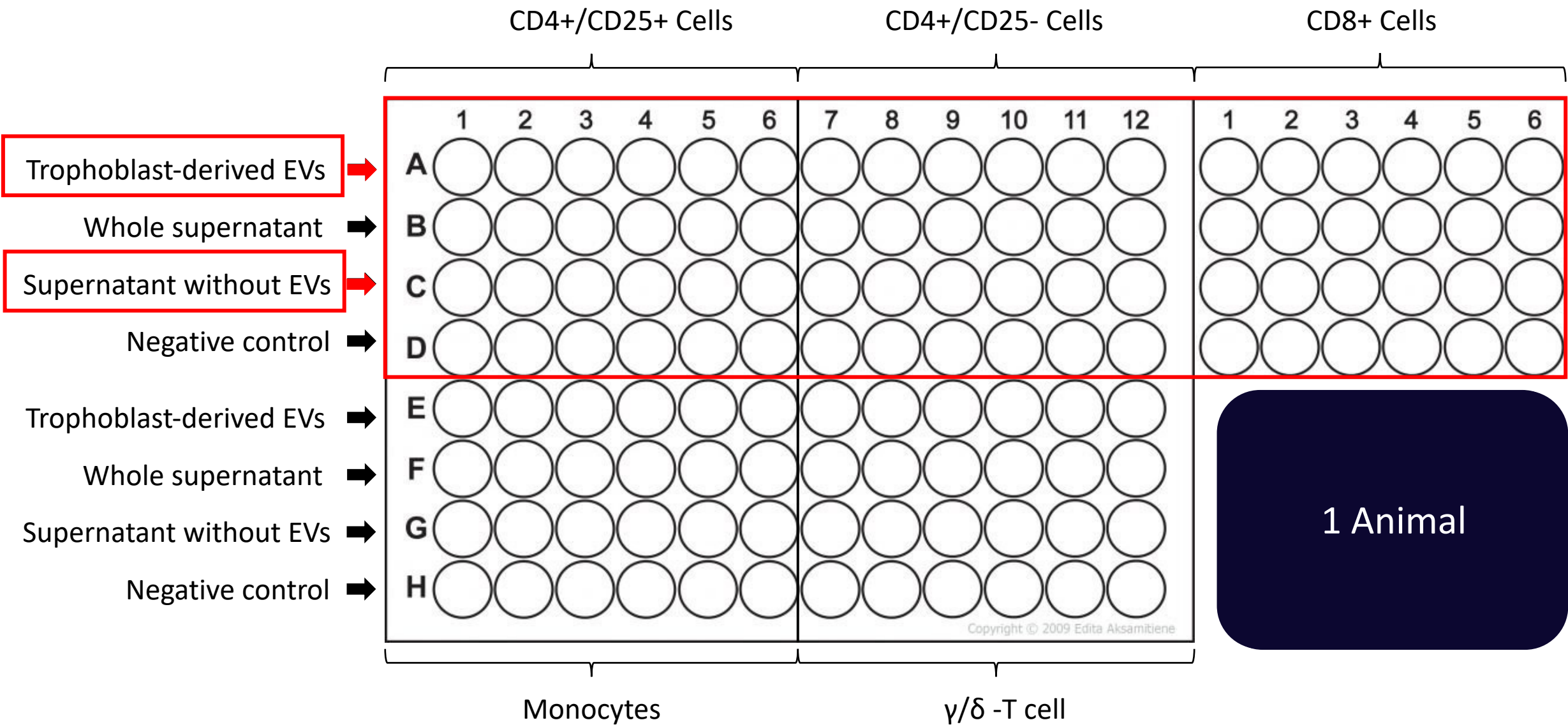
Hypothesis



Goal: Determine gene expression profile of immune cells under influence of placental EV

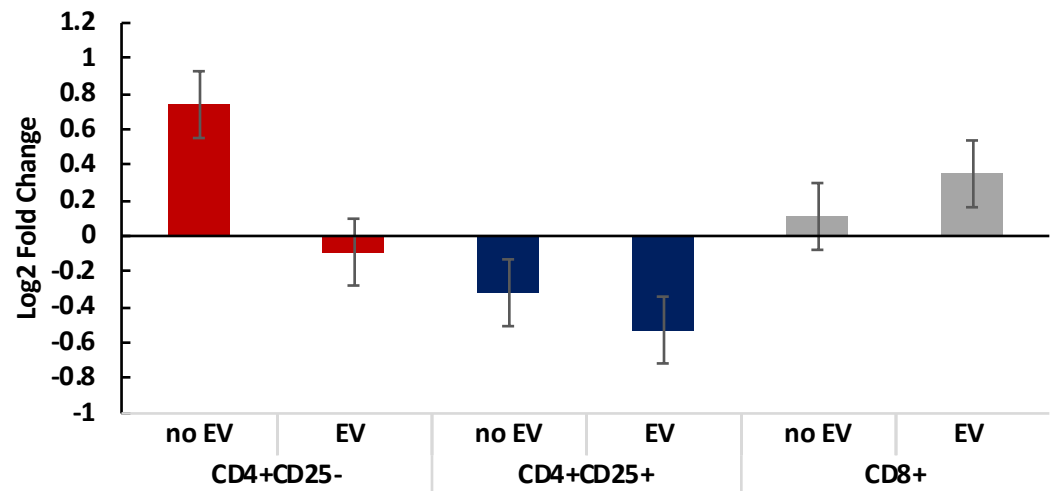


Experimental Design



Results

Gata3 Gene Expression



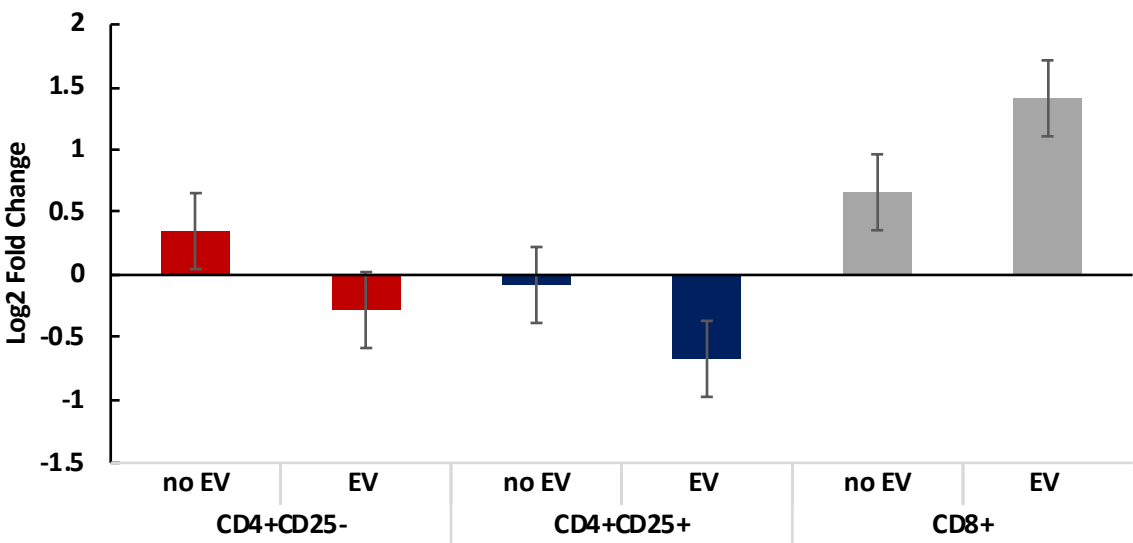
Suppress cell-mediated immunity

CD4+CD25-	Downregulated
CD4+CD25+	Downregulated
CD8+	Upregulated

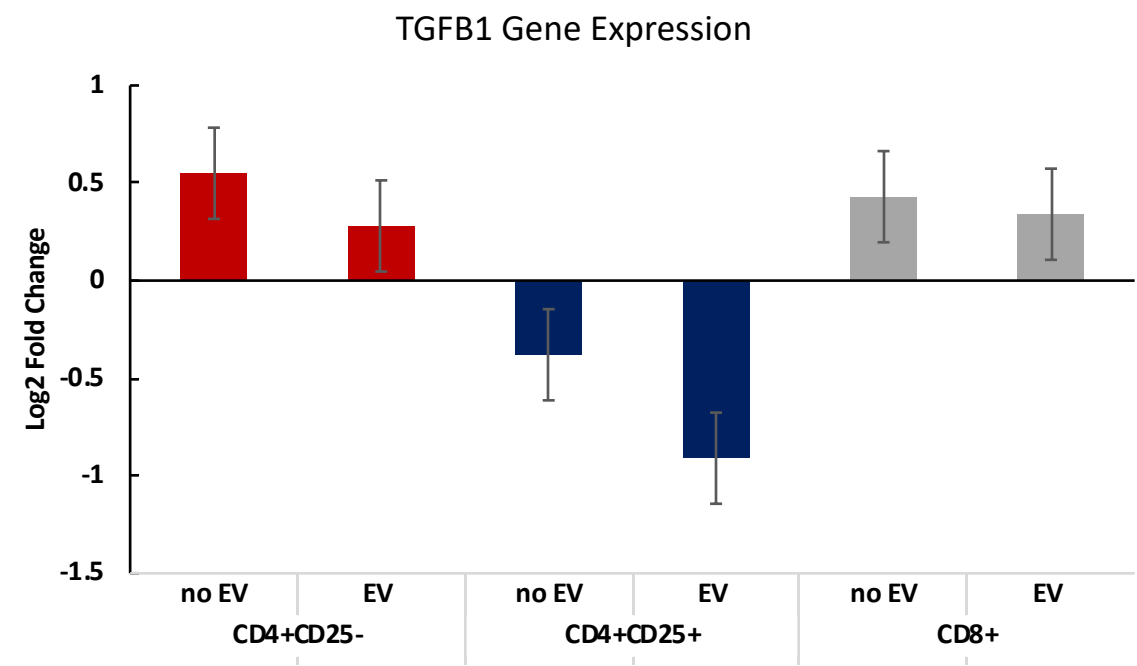
Suppress cell-mediated immunity

CD4+CD25-	Downregulated
CD4+CD25+	Downregulated
CD8+	Upregulated

Foxp3 Gene Expression



Results

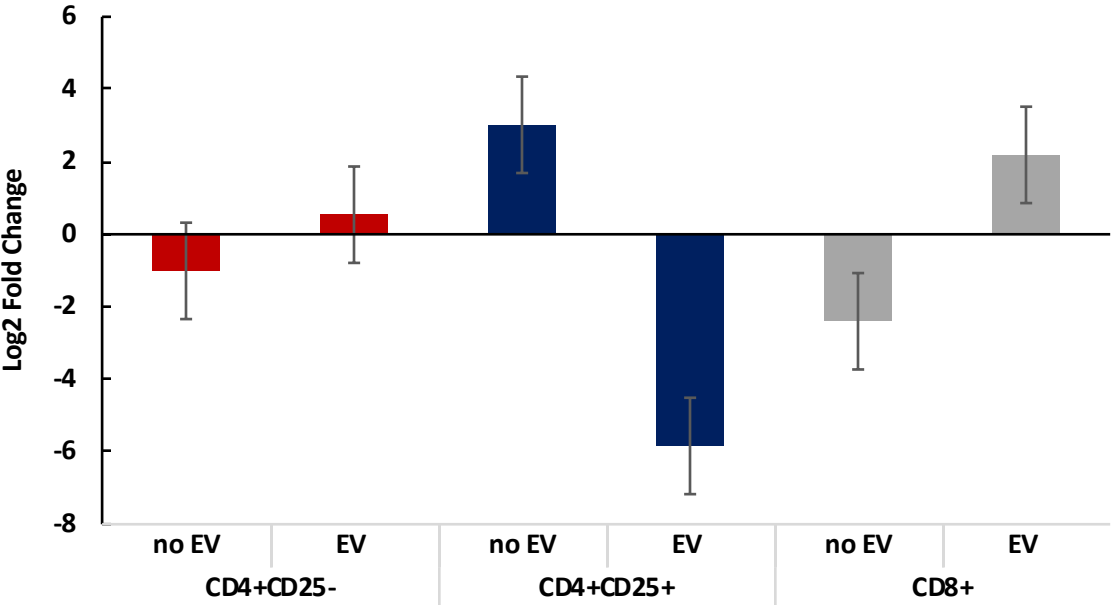


Suppress cell-mediated immunity

CD4+CD25-	Downregulated
CD4+CD25+	Downregulated
CD8+	No change

Results

IL2 Gene Expression



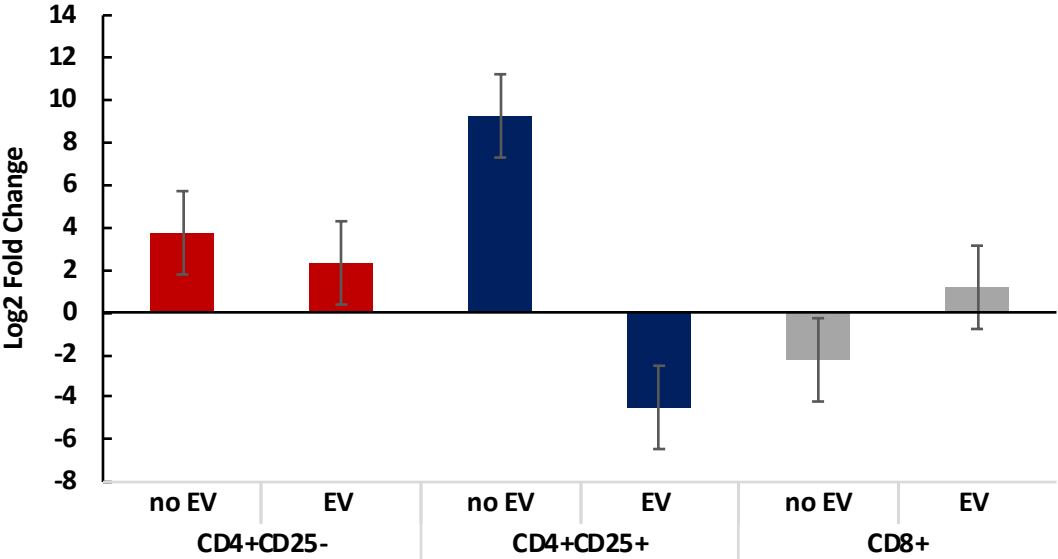
Stimulate cell-mediated immunity

CD4+CD25-	No change
CD4+CD25+	Downregulated
CD8+	Upregulated

Stimulate cell-mediated immunity

CD4+CD25-	No change
CD4+CD25+	Downregulated
CD8	Upregulated

IL17 Gene Expression



Summary

Trophoblast-derived EVs modulate immune cells
gene expression

Trophoblast-derived EVs are potentially related to shift from
a stimulant to a suppressive immune response

Trophoblast-derived EVs most likely are important agents to
regulate a successful pregnancy



USU Extension Photo Gallery

Perform quantitative RT-PCR of four more animals

If results are consistent, design and perform *in vivo* experiment

Future directions

Committee

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Agricultural Experiment Station - USU**



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