**Trophoblasts stimulate the release of MMP10 by endothelial cells.**

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**Background:** The maternal uterine spiral arteries (SpA) change significantly during the first weeks of pregnancy resulting in increased blood flow to the developing fetus. Endothelial cells (EC) and vascular smooth muscle cells (VSMC) are lost from the vessel wall and are replaced by extravillous trophoblasts. Using a 3D model of the vessel wall we have shown that the expression of a number of genes alters following stimulation with trophoblast conditioned media (TCM), including MMP10, an enzyme involved in the breakdown of the extracellular matrix.

**Objective:** To investigate the regulation of EC derived MMP10 by trophoblast.

Methods: The human endothelial line SGHEC-7 were incubated with TCM, TGFβ and IL1β for up to 72h and the release of MMP10 determined by ELISA. To characterise the response in more detail these stimuli were also used in the presence of pharmacological inhibitors including the STAT3 inhibitor, STAT3 Inhibitor VIII. First trimester decidual tissue from normal pregnancies were fixed and stained for CK7 (trophoblasts) and MMP10.

**Results:** EC but not VSMC secreted MMP10. MMP10 expression in decidual tissue seemed to be associated with the presence of trophoblast. TCM stimulates MMP10 secretion from EC in a dose dependent manner. Trophoblast secrete a number of growth factors and cytokines including IL1β, IL6 and TGFβ-1. The secretion of MMP10 was significantly stimulated by IL1β (p<0.05; n=3) and TGFβ-1 (p<0.05; n=3) but not IL6. The secretion of MMP10 in response to TCM was significantly inhibited by the STAT3 inhibitor VIII.

**Conclusion:** The expression and secretion of MMP10 in response to factors released by trophoblasts is restricted to EC. It would therefore appear that trophoblast may mediate SA remodelling in part via the release of MMP10 from the EC.