

## A PERI-OVULATORY PLASMA GLYCOPROTEIN ALTERS THE TRAFFICKING POTENTIAL OF CD56<sup>bright</sup> (NK) NATURAL KILLER CELLS

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**BACKGROUND.** Decidua, the maternal uterine tissue that interacts with invasive fetal trophoblast cells of placenta, is rich in NK cells. Both homing and *in situ* proliferation are thought to rapidly increase the low NK cell numbers found in pre-ovulatory endometrium, shortly after ovulation. Using adhesion of human blood NK cells to frozen sections of mouse gestation day 7 decidua, as an assay for uterine homing potential, a brief interval of increased adhesion has been found at the middle of the menstrual cycle immediately after ovulation. The molecular basis for this functional change is unknown, although it is abrogated by antibodies to L-selectin, V4 integrin, VCAM or MAdCAM.

**OBJECTIVE.** To evaluate plasma and its glycoprotein-enriched and -depleted fractions for contributions to changes in the functional interactions between blood NK cells and decidual endothelium.

**METHODS:** Peripheral blood lymphocytes (PBLs) were collected from 7 male donors and incubated (2 hr) in serum-free RPMI or in plasma from 15 fertile women (paired samples taken at cycle day 5 and day of ovulation). Cells were then washed, labelled with anti-CD56PE and applied for 30 min to frozen mouse decidua sections under shear forces before adherent cells were enumerated under epi-fluorescent illumination. Whole plasma (diluted to 10 mg/mL RPMI) and plasma fractions enriched or stripped of glycoproteins (Qproteome Glycoprotein kit, Qiagen, Mississauga, ON) were examined. The six plasma samples from a single woman were tested on the same male cells in a single experiment and replicated with cells from at least three male donors. Data were analyzed by paired t tests.

**RESULTS AND CONCLUSIONS** Adhesion of CD56<sup>bright</sup> cells was similar after culture in RPMI or whole plasma from women at cycle day 5, but significantly increased following culture in ovulation-day plasma. Considerable variation in baseline adhesion of cells from a single male donor was induced by unseparated plasma from different women. Baseline adhesion was also found in the glycoprotein negative and positive fractions at cycle day 5 and the negative fraction at ovulation. Significantly increased adhesion was promoted by the ovulatory glycoprotein positive fraction. These results indicate that circulating ovulatory glycoproteins cyclically modify the functions of blood NK cells.

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