REPRODUCTIVE ENDOCRINOLOGY

A microRNA prevents cervical embryonic implantation

What are the mechanisms that prevent implantation of embryos in the cervix, rather than the uterus? A new study reveals that microRNA regulation might play an important part in this process.

Cervical implantation and placenta previa are complications of pregnancy that are associated with a substantial risk of severe bleeding and mortality. Yasushi Hirota and colleagues set out to investigate why, in the presence of the same hormonal milieu in the uterus and cervix, embryos do not usually attach to the cervix.

Analysis of endometrium of mice and women showed marked differences in cell proliferation and differentiation between the cervix and the uterus. Experiments in pregnant mice revealed that the levels of the progesterone receptor are lower in the cervix than in the uterus. As the mRNA levels of the receptor in the uterine and cervical epithelia were similar, the

researchers hypothesized that the differences in protein levels were due to post-transcriptional regulation. They identified a microRNA, miR-200a, that is upregulated in the cervix, which leads to inactivation of progesterone signalling: miR-200a downregulates the progesterone receptor and also STAT5, a protein that downregulates 20 α -HSD, an enzyme that metabolizes progesterone.

“Progesterone signalling is essential for uterine receptivity and implantation following estrogen exposure,” explains Hirota. “Our findings may help to better understand a potential pathological basis of cervical pregnancy and placenta previa in humans.”

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Original article Haraguchi, H. *et al.* MicroRNA-200a locally attenuates progesterone signaling in the cervix preventing embryo implantation. *Mol. Endocrinol.* doi:10.1210/me.2014-1097