TEST: Endometrial Immune Profile

The Endometrial Immune Profile (EIP) test is performed to evaluate the endometrial mucosal lining to determine if expression of immune-related factors is skewed towards excessive immune activation or inadequate immune activation, both of which would not be supportive for implantation and/or proper placental development. The analytes tested include IL-18, IL-15, TWEAK and Fn14.

The condition of the endometrium is key for successful implantation and for supporting the development of the placenta and the pregnancy overall. The data show that endometrial immune profiling can predict the success of implantation. It has been determined that the condition of the endometrium ranges from high to low immune activation. Key factors to determine the immune profile include IL18, IL-15, TWEAK and Fn14. IL-18 is a pro-inflammatory cytokine, and IL-15 regulates proliferation and activation of NK cells. TWEAK (TNF like weak inducer of apoptosis) is thought to offer protection against TNF. It is a multifunctional cytokine: pro-angiogenic, participating in processes of wound repair and tissue regeneration. Fn14 (fibroblast growth factor inducible 14) is the receptor for TWEAK. The TWEAK-Fn14 axis plays a beneficial role in tissue repair and angiogenesis in vivo; and regulates cell proliferation, migration, survival and differentiation. Balance of activating signals (IL-18, IL-15) versus controlling signals (TWEAK, Fn14) can be measured as following ratios: IL-18/TWEAK, IL-15/Fn14. Patients with high IL-18/TWEAK mRNA ratio often show excessive uNK cell recruitment with enhanced activation of NK cells. Patients with low endometrial IL-15/Fn14 mRNA ratio might reveal low count or inadequate functional activity of uNK cells. Specific recommendations for high or low immune endometrial activation are discussed in Ledee et al, 2016.

SPECIMEN REQUIREMENTS: Endometrial biopsy obtained during the mid-luteal phase, 7 to 9 days after ovulation. Biopsy should be performed according to a standard procedure with a Pipelle catheter or similar. About 30-50 milligrams of tissue is required for analysis (for illustration purposes, this equates to one or two cubes of approximately 3x3 millimeters). Specimen should be collected into a tube with 3ml of RNA stabilization solution (provided by the laboratory) and shipped to the laboratory at ambient temperature.

SPECIMEN STABILITY in RNA stabilization solution: room temperature – 1 week, refrigerated – one month.

REJECTION CRITERIA: Absence of sizeable endometrial tissue fragments. Inadequate sample consisting only of blood and/or mucous substance resulting in RNA quantity and/or quality too low to perform assay. Sample received in formalin solution.

METHODOLOGY: mRNA expression is evaluated by RT-qPCR.

REFERENCES:

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Lédée N, Prat-Ellenberg L, Chevrier L, Balet R, Simon C, Lenoble C, Irani EE, Bouret D, Cassuto G, Vitoux D, Vezmar K, Bensussan A, Chaouat G, Petitbarat M. Uterine immune profiling for increasing live birth rate: A one-to-one matched cohort study. J Reprod Immunol. 2017, 119:23-30.

Turnaround time: 7 – 10 business days.