Im Map®

Immunology Map

igls
Integrated Genetic Laboratory Services

Immunological factors are cause of many cases of unexplained infertility

Repeated Implantation Failure (RIF) and Recurrent Miscarriage (RM) are two of the most challenging conditions in reproductive medicine. RIF is determined when embryos of good quality fail to implant following several IVF treatment cycles. Recurrent miscarriage is defined as three or more consecutive pregnancy losses.

IGLS offers Im Map®, a comprehensive immunological test to help identify the cause of recurrent miscarriage or implantation failure in challenging cases, where embryonic causes and/or other endometrial factors have been ruled out.

The process

1. Biopsy of endometrial tissue P+5.5 /LH+7
2. Introduction in the Im Map® cryotube
3. Sample shipment at 4°C
4. Analysis of immune cells levels
5. Results in 15 working days
6. Immunotherapy

NK Cell Activity Assay

NK (Natural Killer) cells are a type of lymphocyte with an important role in the immune system, as they are able to differentiate and eliminate exogenous cells. NK cells are the predominant immune cell population in the secretory endometrium and decidua during early pregnancy. Uterine NK cells are involved in embryo recognition and the initiation of maternal–fetal immunotolerance at the beginning of implantation. Several studies have linked high levels of NK cells in the endometrium to implantation failure and miscarriage[1-2]. The IGLS NK cell activity assay allows identification of the NK cell population present in both the endometrium so that alterations in their levels can be found and patients can be offered specific immunotherapy to improve implantation and increase the likelihood of pregnancy.

Th1/ Th2 balance study

Th1 and Th2 are a type of lymphocytes responsible for coordinating the cellular immune response. Th1 cells secrete small proteins called cytokines that are active agents in the induction of the immune response, whereas Th2 cells secrete cytokines that regulate the immune response. There is a close relationship between the production of cytokines by Th1 and Th2 lymphocytes. During pregnancy there is a shift in cytokine production from Th1 to Th2. This shift induces maternal tolerance of the developing embryo. Dysregulation of the Th1/Th2 cell balance and elevated Th1 cytokine levels have been associated with pregnancy loss, preterm delivery or preeclampsia[3]. Women with recurrent miscarriages have been shown to have increased Th1/Th2 cell balance compared to women with successful pregnancies[4,5,6]. Specific immunotherapy is available for cases with altered Th1/Th2 ratio.

Regulatory T-cell study

Regulatory T cells (Treg) are highly specialized T cells that play an essential role in the regulation of the immune response and the prevention of immune disorders. Treg cells promote fetal survival by preventing the maternal immune system from acting against the paternal tissue and thus preventing embryo rejection[7]. Several studies have demonstrated a decrease in Treg cells and, consequently, an alteration in tolerance, in patients who have undergone spontaneous abortions during the first trimester[8]. The study of Treg cells will allow women who present alterations in Treg cells to benefit from immunotherapy treatment.

Process details

Im Map® is carried out thanks to an endometrial biopsy during the luteal phase for diagnosis. The endometrial biopsy sample can be obtained in parallel with the biopsy of our ER Map® endometrial receptivity analysis test, at LH+7 in a natural cycle or at P+5.5 in a substituted cycle. Samples are analyzed using a flow cytometer. Flow cytometry is a biophysical technology used to detect immunological markers and count cell populations. It allows simultaneous multiparametric analysis of the physical and chemical characteristics of millions of cells within minutes. If abnormal levels of immune cells are detected, various immunotherapy options suitable for each patient can be offered.
These immunological treatments can help improve the reproductive outcome of patients, increasing the chances of embryo implantation and reducing the likelihood of miscarriage.

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