

Novel Protein Essential for Successful Pregnancy

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(PhysOrg.com) -- Researchers at Yale School of Medicine and their colleagues at the Society for the Investigation of Early Pregnancy have helped clarify the function of a unique protein called Preimplantation Factor, which is produced by healthy embryos to direct embryo attachment and help the mother adapt to pregnancy.

These findings are published fast track for the benefit of the scientific community in the current issue of [American Journal of Obstetrics and Gynecology](#). They were first presented orally in February at the Society for Maternal Fetal Medicine Scientific Meetings in Chicago by lead author Michael J. Paidas, M.D., associate professor and co-director of the Yale Women and Children's Center for Blood Disorders.

The research showed that Preimplantation Factor modulates maternal immunity, promotes attachment of the early embryo, and influences remodeling of uterine cells.

“Preimplantation Factor appears to be essential for pregnancy to succeed,” said Paidas. “For several decades, investigators have tried to isolate a compound that was absolutely required for pregnancy. We believe that Preimplantation Factor is in fact that compound.”

Paidas and his colleagues conducted a genomic and proteomic study of both non-pregnant and pregnant uterine stromal cells, which are positioned directly beneath the uterine lining (epithelium). When these cells in culture were exposed to Preimplantation Factor, over 500 maternal genes and several proteins were significantly altered. Interestingly, Paidas said, profound changes were detected precisely in those pathways and networks critical for implantation.

Preimplantation Factor was discovered by co-author Eytan R. Barnea, M.D., founder of the Society for the Investigation of [Early Pregnancy](#) and clinical associate professor in the Department of Obstetrics, Gynecology & Reproduction, UMDNJ-Robert Wood Johnson Medical School. Barnea eventually synthesized Preimplantation Factor so that the replicated form is identical to the native compound.

Studies are ongoing to establish Preimplantation Factor as a diagnostic test for pregnancy viability, not only in humans but in animals as well, since it appears to be universally present in mammals. Paidas said that there is even greater interest in the potential therapeutic applications, both in [pregnancy](#) and in other conditions such as autoimmune disease and transplantation. Preclinical studies are being conducted to pave the way for eventual human clinical trials.

Other authors on the study include Graciela Krikun, S. Joseph Huang,

Michael Romano, and Jack Annunziato of Yale Department of Obstetrics, Gynecology and Reproductive Sciences; and Richard Jones of Next Gen Sciences, Inc.

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