formerly preeclamptic women. Perhaps even more intriguingly these factors also seem to predispose to abnormal placentation.

In this presentation I will review current working models of preeclampsia. With these models as a framework, I will address current information on implantation and vascular remodeling, as well as relevant maternal pathophysiological interactions. Current concepts and supporting data for mechanisms linking these two features of preeclampsia, maternal and fetal, will also be addressed. In all of these settings I will focus special attention on the paradoxes, information that does "not fit". Where possible resolutions will be proposed.

Guided by this information I will then present my personal concept of where research in the field may be heading. This will include targets, strategies and most bravely (foolishly?) speculations for what we may discover.

doi:10.1016/j.jri.2012.03.261

**IS 11**

## Acquisition of uterine receptivity: Partaking of inflammation

Y. Gnainsky[1], I. Granot[2], A. Barash[2], Y. Or[2], D. Levin[2], G. Mor[3], N. Dekel[1,*]

[1] *Department of Biological Regulation, Weizmann Institute of Science, Rehovot, Israel*
[2] *IVF Unit, Department of Obstetrics & Gynecology, Kaplan Medical Center, Rehovot, Israel*
[3] *Department of Obstetrics and Gynecology, Yale University, School of Medicine, New Haven, CT, USA*

Acquisition of uterine receptivity, an essential prelude for successful embryo implantation, is fully dependent on the development of adequate conditions for the attachment of the conceptus to the endometrial epithelium. The particular constituents of such "adequate conditions" are not as yet defined and markers for a receptive endometrium are practically unavailable. Furthermore, the disappointing, poor rate of pregnancy, presently achieved following the transfer of high quality embryos makes implantation the rate-limiting step for the success of in vitro fertilization. A substantial increase in pregnancy rate, induced by endometrial biopsy in patients with recurrent implantation failure, has been reported by us and confirmed by others. Along this line, we have later demonstrated that uterine dendritic cells are crucial for implantation in mice. Taking these findings into account we raised the hypothesis that local injury generated by endometrial biopsy increases uterine receptivity by provoking inflammation. The overall goal of our study was to unveil the role of inflammation in successful implantation, further providing valuable clinical information that will be translated into diagnosis and treatment of infertility. Our experiments were specifically directed at 1) Characterization of the response of human endometrial cells to inflammatory-inducing agents, 2) Examination of the effect of immune cells on endometrial cell differentiation and 3) Establishment of biomarkers for predicting implantation competence. The results of our study suggests a mechanism by which endometrial biopsy treatment increases the success of pregnancy, unveiling the role of inflammatory cytokines and specific immune cells in acquisition of endometrial receptivity. Most importantly, our research identifies a potential biomarker for implantation competence. This information will potentially define new clinical strategies to treat infertility when implantation fails.

doi:10.1016/j.jri.2012.03.262

**IS 12**

## Inflammation in the uterus: friend or foe?

G. Chaouat

*U 976 Institut national de la santé et de la recherche médicale (INSERM)/UMR 976 CNRS, Hospital Saint Louis, Paris, France*

In this review presentation, we will first recall the Th1/Th2 paradigm, and as one of its consequences the view that inflammation per se is abortifacient. However, scratching under progesterone or progesterone + estrogen treatment, or mating with a vasectomised male, has been known since the 50 s or 70 s to induce décidualisation, and has been used for long to transfer embryos, genetically modified or not, in foster mothers. Injection of NaCl, or oil, has also been used. The work carried after the discovery of immunotrophism lead to the discovery that CSFs were useful for implantation, but also to the Th1/Th2 paradigm, for which inflammation and NK activation are "bad guys". However, as early as 1990, it was realized that there was immediately post mating an influx of leucocytes and macrophages in the post mating, pre implantation uterus in mice and men (no reference to John Steinbeck Novel). Impeaching this inflammation prevents implantation. This was followed by the works of Andrews and Wood group showing the presence at high titers of classical inflammatory cytokines in the pre implantation uterus. This became understandable when it was said "would there be life without LIF", the 1st cytokine mandatory for implantation in mice, and whose status will be briefly discussed in other species, including of course human. The IL-1 controversy, the status of IL-11, and of TNF, and regulation by TWEAK will be discussed, as well as the new role for perivascular gamma interferon. However, excess inflammation or inflammation at the "wrong period" is either anti implantation (occult losses) or abortifacient, and this will be shown with high doses of TNF or gamma interferon and the dual status of IL-12 and IL-18 will be discussed. We will then turn to IL-17 and to NK hyper activation directly or in a transfer system, as well as the role of IL-17. We will finish by discussing animal models of endometriosis, and the anti implantation effects in several animal modes of endometriosis as well as for in vitro models of human implantation.

doi:10.1016/j.jri.2012.03.263