

Editorial

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Frontiers in reproductive immunology – Forum introduction

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It has been 50 years since Sir Peter Medawar kindled scientific interest in the unique problem posed by the existence of the fetal allograft within the uterus [1]. The resultant efforts of immunologists and reproductive physiologists to understand the mechanisms by which the conceptus successfully evades rejection by the maternal immune system has led to a richer understanding of the nature of immune responses in the uterus and of their regulation by maternal and conceptus signals (see Billington, 1993 for a reflection on the progress since Medawar's seminal paper [2]). Increasingly, the fact that the immune system is functional in the reproductive tract of the female is being recognized not only as a potential threat to the conceptus but as an important part of host defense in the female. The female reproductive tract is invaded by microorganisms at mating, parturition, and other times and it is critical to the health of the female that the immune system functions effectively in the uterus. Indeed, one can view the principles of reproductive immunology as at the center of combating one of the major health crises in the world – the spread of venereal diseases, including acquired immune deficiency syndrome.

This forum seeks to highlight areas of reproductive immunology research that are changing our understanding of the nature of the interaction of the immune and reproductive systems. Three papers, in a section entitled "Reproductive Tract Defenses Against Pathogens" address the central role of the immune system within the reproductive tract – preventing and eliminating foreign pathogens. King and coauthors delineate the role of the innate immune system in host defense within the reproductive tract. Lewis describes the critical actions of ovarian steroids in modulating the effectiveness of reproductive tract defenses against microorganisms and Corbeil illustrates

strategies for developing vaccines against sexually-transmitted diseases.

A second section of the forum, entitled "Immunological Adjustments During Pregnancy" describes some recent concepts to explain survival of the conceptus during pregnancy. Emphasis is given to the critical role that macrophages (article by Mor and Abraham) and gamma-delta T cells (article by Mincheva-Nilsson) play in this process.

Papers in the third section, entitled "Pathological Consequences of Inappropriate Immune Function in the Reproductive Tract" illustrate some of the deleterious consequences for reproductive function that arise when the immune system functions in an aberrant manner. KanellopoulosLangevin and coauthors describe how inflammatory mediators at the feto-maternal interface can disrupt the course of pregnancy and Peltier highlights the problem of premature labor caused by production of proinflammatory cytokines. Finally, using the example of endometriosis, Kyama and coauthors point out that inappropriate immune function in the uterus may lead to abnormal reproductive tract function in the nonpregnant female.

References

1. Medawar PB: **Some immunological and endocrinological problems raised by the evolution of viviparity in vertebrates.** *Symp Soc Exp Biol* 1953, **7**:320-338.
2. Billington WD: **The immunological problem of pregnancy: 50 years with the hope of progress. A tribute to Peter Medawar.** *J Reprod Immunol* 2003, **60**:1-11.