

NOVEL UTERINE GENES IN REGULATION OF EMBRYO IMPLANTATION

G. Nie, Y. Li, K. Luu, J. Findlay, L. Salamonsen

Uterine Biology Laboratory, Prince Henry's Institute of Medical Research, Melbourne, VIC, Australia

Implantation of the embryo into the maternal endometrium is the first and critical step leading to the establishment of a pregnancy. It has been well established that only during the 'window' of implantation, a limited time span when the uterine environment is receptive, can a blastocyst successfully implant into the uterus. The development of uterine receptivity is accompanied by remarkable morphological and physiological changes in the endometrium, and this is primarily driven by the coordinated effects of the ovarian steroid hormones. Uterine tissue remodelling during implantation also contributes significantly to the development of the placenta. Insufficient uterine remodelling causes implantation failure and infertility. To date, the exact molecular events occurring in the uterus during the establishment of receptivity and at the actual site of implantation are still not well understood. We used the mouse as a model and identified a number of previously unrecognised molecules that are uniquely regulated in the early stages of implantation: one of these is proprotein convertase 6 (PC6). The potential importance of these genes and their products in modulating fertility in the primate, including the human, was demonstrated by their unique spatial and temporal expression in the endometrium of human and rhesus monkey during the phase of uterine receptivity and at implantation. The importance of the genes for implantation was ultimately confirmed by functional studies *in vivo* using morpholino antisense oligonucleotides. These molecules will be discussed in terms of their identity, expression and functions.