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Roles of prostaglandin receptors in implantation and decidualization

Abstract:

Embryo implantation and subsequent decidualization are critical processes for the establishment of a healthy pregnancy, but the molecular mechanisms underlying therein remain unknown. Prostaglandins (PGs) are bioactive lipids derived from arachidonic acid in membrane phospholipids, synthesized with phospholipase A₂(PLA₂) and cyclooxygenase (COX) as rate-limiting enzymes. Upon synthesis, PGs are rapidly released into the extracellular space, acting on eight distinct G protein-coupled receptors expressed on neighboring cells, to contribute to the maintenance of local homeostasis and the fulfillment of reproductive processes. Previous studies using mice deficient in each gene encoding enzyme involved in PG synthesis, such as cytosolic PLA₂α and COX, have demonstrated that PGs play crucial roles in implantation and decidualization. Recently, COX isozymes, COX-1 and COX-2, were found to play distinct roles in implantation and decidualization. Furthermore, PG receptors involved in implantation and decidualization have been identified. In this talk, I will summarize the role of PGs in implantation and decidualization from the viewpoint of COX and receptors, and discuss whether this could be the key to overcoming implantation failure, a critical issue in human infertility.

Keywords: autacoid, cyclooxygenase, decidualization, implantation, prostaglandin

Biography: Dr. Yukihiro Sugimoto earned his Ph.D. from Kyoto University in 1994. He served as an Assistant Professor (1992-1997) and Associate Professor (1997-2009) at Kyoto University. Since 2009, he has been a Professor of Biochemistry at Kumamoto University