S Mondal et.al., Biochem Anal Biochem 2017, Volume 7
DOI: 10.4172/2161-1009-C1-017

Effect of $PGF_{2\alpha}$ receptor antagonist on prostaglandin production and COX-2 protein expression in bovine endometrial epithelial cells

S Mondal[1], P Chapdelaine[2] and M A Fortier
[1]National Institute of Animal Nutrition and Physiology, India
[2]Laval University, Canada

Statement of the Problem: Prostaglandins (PGs) play an important role in regulation of estrous cycle, recognition of pregnancy and implantation in ruminants. The first limiting step in the generation of PGs is the transformation of arachidonic acid by cyclooxygenases-1 and -2 (COX-1, -2). The downstream enzymes, prostaglandin E synthase (PGES) and prostaglandin F synthase (PGFS) catalyze the conversion of PGH_2 into PGE_2 and $PGF_{2\alpha}$, respectively. $PGF_{2\alpha}$ acts as the luteolytic agent to control estrous cycle whereas PGE_2 helps in implantation and maintenance of pregnancy. $PGF_{2\alpha}$ exerts its autocrine/ paracrine action by binding to its receptors to mobilize intracellular Ca^{2+} and IP3. Activation of FP receptors by $PGF_{2\alpha}$ results in phospholipase C activation, inositol triphosphate hydrolysis and intracellular calcium flux. Pharmacological inhibition of FP receptor antagonist (AL 8810) has been found to decrease PGE_2 production in human endometrial cells treated with IL-1β.

Purpose: The purpose of this study is to explore the effect of $PGF_{2\alpha}$ receptor antagonist on prostaglandin production and protein expression in bovine endometrial epithelial cells.

Methodology & Theoretical Orientation: Endometrial epithelial cells at the stage of confluence were incubated with vehicle and/ FP receptor antagonist (AL 8810) for 30 min. Thereafter, the cells were stimulated with vehicle, OT, IFN and OT+IFN in absence and/ presence of AL 8810 for 6 hrs.

Findings: Oxytocin had been found to increase the production of $PGF_{2\alpha}$ in cultured cells in presence of both 10 μM and 25 μM AL 8810 but production was more with 10 μM AL 8810 treatment group. Similarly, OT increased PGE_2 production in presence of 10 μM AL 8810 in epithelial cells. The expression of COX-2 protein increased by treatment of AL8810 in presence of OT and OT+IFN but decreases in the presence of IFN alone.

Conclusion & Significance: Production of prostaglandin and COX-2 expression are modulated by $PGF_{2\alpha}$ receptor antagonist.

Biography

S Mondal has completed his PhD from Indian Veterinary Research Institute, Bareilly and Postdoctoral studies from Laval University, Canada. He is presently working as Principal Scientist at NIANP, Bangalore. He has been working in the field of molecular endocrinology, reproductive genomics and stress physiology for last 20 years. He has published over 55 papers in various national and international journals of repute. He has also received several prestigious awards like Siri Research Award, Prof. G P Talwar Midcareer Scientist Award, Prof. G K Pal Award, Fellow of Indian Chemical Society, Fellow of Society for Applied Biotechnology, Fellow of Indian Association of Biomedical Scientists, Dr. K Anji Reddy Award, Prof. P B Sen Memorial Oration Award, Biotechnology Overseas Associateship Award (Long term), ISSRF Young Scientist Award and Indian Science Congress Association Award.

sukanta781@gmail.com

Notes: