

## The roles of progesterone receptor membrane component 1 (PGRMC1) in cyclic AMP-induced human endometrial and trophoblast cells differentiation

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Differentiation of human endometrial stromal cells into decidual cells is indispensable for the embryo implantation during the mid-secretory phase of the menstrual cycle. After the implantation, placental villus cytotrophoblasts differentiate into syncytiotrophoblasts to form placenta. These differentiation events of ESCs and trophoblasts cells are induced by the activation of cyclic AMP (cAMP) signaling pathway. Progesterone (P4) receptor membrane component 1 (PGRMC1) is a member of a P4 binding complex implicated in female reproduction, however, its role in ESCs and trophoblast cells differentiation has not been examined. In this study, we explored the significance of PGRMC1 in cAMP-induced differentiation of ESCs and trophoblast cells. Treatment of ESCs with the cAMP analog dibutyryl (db)-cAMP repressed PGRMC1 expression. Both knockdown and inhibition of PGRMC1 significantly promoted the expression of differentiation markers such as IGF-binding protein 1 and prolactin in db-cAMP-stimulated ESCs. Furthermore, inhibition of PGRMC1 facilitated the production of human chorionic gonadotropin (HCG), which is the differentiation marker of syncytiotrophoblast in placental choriocarcinoma BeWo cells. These findings suggest the significance of P4-independent inhibitory action of PGRMC1 in cAMP-induced ESCs and trophoblast differentiation.