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Pregnenolone as a new hormone therapy for female diseases targeting ERβ

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Many steroid hormones such as estrogen (E2) bind their receptors to regulate biological processes. Pregnenolone (PG) is the precursor from almost all of the other steroid hormones and is used for skin disorders and reproductive complications. However, mechanism and function of PG are not well established in the uterus. In this study, we examined the effects of PG on the activation of estrogen receptor (ER) in uterus. First, we performed computational structure prediction of PG-ER complexes and PG showed high affinity with ERβ. To study the mechanism of PG directly, Ishikawa cells were transfected with ERE-luciferase plasmid and isoforms of ERs. ERE-luciferase activity induced by PG was similar with E2 and showed high activity with ERβ plasmid. Also, the expression of ERα target genes in cells treated with PG was reduced compared to E2. In immature rat, PG negatively regulated the expression of ERβ in the uterus. These findings suggest that PG stimulates ERβ-mediated signaling in the uterus. Activation of ERβ by PG may help to overcome ERα-related female reproductive diseases such as endometriosis, breast cancer and ovarian cancer.

Biography

Ye Young Shin has completed her Bachelor's degree from Department of Biomaterials Science, Pusan National University, South Korea.

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