**17β-Estradiol Enhances Human Embryonic Kidney 293 Cell Spreading and Migration Pattern in Estrogen Receptor-α-independent Pathways**

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**Backgrounds:**

The incidence of end-stage renal disease is increased in men as well as postmenopausal women. Nevertheless, deficient of estrogen receptor-α (ERα) signaling results in glomerulonephritis in mice models. Evidence implies the regulation of estrogen/estrogen receptor axis may play a protective role in the development of glomerulonephritis, however, the detail mechanisms remain to be investigated. As the regulation of cell motility is vital for kidney development and homeostasis, the purpose of this study was to examine the effects of 17β-Estradiol ($E_2$) on kidney cells with or without ERα using cell-based system.

**Materials and Methods:**

Human Embryonic Kidney 293 (HEK293) cells, with no detectable endogenous ERα, were used to ectopically express ERα (HEK/ERα), whereas those transfected empty vectors were used as controls (HEK/Vector). After treatment with $E_2$ ($10^{-7}$ M) for 16 h, the cell motility were detected by using the transwell assay, cell viability were analyzed using the water-soluble tetrazolium WST-1 assay, and the signaling transduction molecules were evaluated by using Western blot analysis, respectively.

**Results:**

$E_2$ significantly enhanced cell spreading and migration pattern in HEK/Vector cells, suggesting the E2-enhanced motility pattern could occur through ERα-independent pathways. While the downstream target molecules require further explore, the signalings may involve phosphorylated-active states of JNK and p38. In addition, although the overexpression of ERα led to significant increase the spreading and migration pattern which was mimicked by E2 treatment, to our surprise, HEK/ERα cells show opposite effects on the motility pattern as well as the active states of signaling molecules in response to E2. Detail molecular mechanisms need further investigation.

**Conclusion:**

We speculate that E2 plays opposite roles in HEK/Vector and HEK/ERα cells, detail investigation on the molecular mechanisms may add the information of the current knowledge on end-stage renal disease.