

The Effect of Pigment Epithelial-Derived Factor (PEDF) Supplementation on Ovarian Aging

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Ovarian aging is associated with diminished fertility and a decrease in overall health quality in women. Innovative approaches are in progress to elongate the functional lifespan of the ovary, which ultimately could extend healthy lifespan. The depletion of the follicle pool is the major cause of the onset of menopause. However, the biological mechanisms underlying this physiological process remain poorly understood. Aging in the ovary has been associated with increased mTOR signaling pathway, fibrosis, and inflammation. Our previous research has identified pigment epithelium derived factor (PEDF) as a systemic anti-aging factor that can modulate angiogenesis, age-related fibrosis, and lipid accumulation. This study aims to investigate the potential benefit of PEDF supplementation on ovarian function during aging.

Forty-four-week-old mice with irregular estrus cycles were treated with PEDF (1mg/mL) or vehicle for a period of four weeks (N = 10). Ovarian function was evaluated through estrus cycle, histological, gene, and protein expression analyses. Mice's estrus cycles, as well as the proportions of quiescent and activated follicles, were similar between the treatment and control groups. Gene expression assessments on PI3K/AKT/mTOR and Hippo pathways revealed no significant difference among groups. Surprisingly, ovaries from mice treated with PEDF exhibited a lower level of p-RPS6 ($p = 0.006$) compared to the control group. Our results suggest that PEDF may influence the mTORC1 signaling pathway in the aging ovary.