

Comprehensive Multi-Omics Study Highlights Osteopontin/SPP1 in Ovarian Aging Control

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Abstract : The study identifies SPP1 as a potential gene associated with ovarian aging, revealing a significant decline in its expression in aged ovaries. SPP1, also known as osteopontin (OPN), is a multifunctional glycoprotein involved with regulatory proteins and pro-inflammatory immune chemokines. However, its genetic links to ovarian aging have not been extensively explored. Spatial transcriptomic analyses were conducted on ovaries from young and aged female mice, along with a sample from a 73-year-old individual. Additionally, single-cell RNA sequencing analysis was performed to identify associations between SPP1 and key genes. The study focused on crucial genes, including ITGAV, ITGB1, CD44, MMP3, and FN1, with a particular emphasis on the correlation between SPP1 and ITGB1. The findings indicate a significant decline in SPP1 expression in aged ovaries, which was consistent in the 73-year-old sample. Single-cell RNA sequencing unveiled associations between SPP1 and key genes, emphasizing a strong co-expression correlation between SPP1 and ITGB1. While the study provides valuable insights, further research is necessary to understand the broader implications and potential applications of SPP1 in ovarian aging. Translating these findings to clinical settings requires careful consideration. The identification of SPP1 as a gene implicated in ovarian aging opens new avenues for advancing precision medicine and refining treatment strategies for conditions related to ovarian aging.

Keywords : SPP1, ovarian aging, spatial transcriptomic, single-cell RNA sequencing

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