

## Investigating the Impact of Magnetic Nanoparticles Containing Cisplatin on the Growth and Fundamental Properties of CD44-Positive Breast Cancer Cells

### **Abstract:**

**Background:** Breast cancer is the most common cancer in women after non-melanoma skin cancer and the second leading cause of cancer-related death in women after lung cancer.

**aim:** The present study aimed to determine the inhibitory effects of magnetic nanoparticles containing cisplatin on the growth and fundamental properties of CD44-positive breast cancer cells.

**Materials Material and Methods:** In this research, after a thorough evaluation of the physicochemical properties of the nanoparticles (using SEM), their size was measured. Then, cellular toxicity and the expression of genes related to fundamental properties were assessed using MTT and PCR techniques.

**Results:** Treatment with magnetic nanoparticles containing cisplatin and cisplatin alone significantly reduced the viability of CD44+ cells after 24 and 48 hours (P-value<0.05). Additionally, these two substances significantly decreased the expression of genes related to fundamental properties, including Sox2, Oct4, Nanog, and Klf4 (P-value<0.05).

**Conclusion:** These results indicate that these compounds have therapeutic potential for targeting and reducing tumorigenic properties in CD44+ breast cancer cells.

**Keywords;** Cisplatin-containing nanoparticles, CD44+ breast cancer cells, Gene expression, Cell viability, Tumor suppression