

**ML22-12 (28/07/2022)**

J Oncol

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. 2022 Jul 6;2022:4202439.

doi: 10.1155/2022/4202439. eCollection 2022.

# No Effect on Tumorigenesis in MG63 Cells Induced by Co-Cultured Mesenchymal Stem Cells

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- PMID: 35847369
- PMCID: [PMC9279036](#)
- DOI: [10.1155/2022/4202439](#)

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## Abstract

Osteosarcoma is a kind of bone tumor with an extremely high malignant degree and often occurs in adolescents. Mesenchymal stem cells are believed to play an important role in the microenvironment of osteosarcoma, but whether they promote or inhibit the development of osteosarcoma is controversial. In this study, the coexpression of mesenchymal stem cells (MSCs) with osteosarcoma cell MG63 was used to explore the effect of MSCs on MG63. We found that co-culture of MSCs with MG63 did not affect the proliferation, invasion, and migration of MG63 cells, nor did it significantly affect the epithelial- and glial-mesenchymal transformation of MG63 cells. Therefore, in this study, we obtained a new concept that MSCs neither promote nor inhibit the occurrence and development of osteosarcoma.

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. 2022 Jun 23;12:933675.

doi: 10.3389/fonc.2022.933675. eCollection 2022.

# Extracellular Vesicles and Resistance to Anticancer Drugs: A Tumor Skeleton Key for Unhinging Chemotherapies

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- PMID: 35814444
- PMCID: [PMC9259994](#)
- DOI: [10.3389/fonc.2022.933675](#)

**Free PMC article**

## Abstract

Although surgical procedures and clinical care allow reaching high success in fighting most tumors, cancer is still a formidable foe. Recurrence and metastatization dampen the patients' overall survival after the first diagnosis; nevertheless, the large knowledge of the molecular bases drives these aspects. Chemoresistance is tightly linked to these features and is mainly responsible for the failure of cancer eradication, leaving patients without a crucial medical strategy. Many pathways have been elucidated to trigger insensitiveness to drugs, generally associated with the promotion of tumor growth, aggressiveness, and metastatisation. The main mechanisms reported are the expression of transporter proteins, the induction or mutations of oncogenes and transcription factors, the alteration in genomic or mitochondrial DNA, the triggering of autophagy or epithelial-to-mesenchymal transition, the acquisition of a stem phenotype, and the activation of tumor microenvironment cells. *Extracellular vesicles* (EVs) can directly transfer or epigenetically induce to a target cell the molecular machinery responsible for the acquisition of resistance to drugs. In this review, we resume the main body of knowledge supporting the crucial role of EVs in the context of chemoresistance, with a particular emphasis on the mechanisms related to some of the main drugs used to fight cancer.