



Indian Journal of Experimental Biology  
Vol. 64, May 2026, pp. 374-382  
DOI: 10.56042/ijeb.v64i05.26306

National Institute of Veterinary, Animal and Allied Sciences  
**NISVPR**  
सीएसआईआर-निस्पर

## Different cellular responses to Artemisinin in cancer and normal cells: evaluation of cytotoxic, genotoxic and antioxidant effects with *in silico* molecular docking

Emre BERK AHU<sup>1</sup>, Dilek PANDIR<sup>2\*</sup> & Mehmet UNSAL BARAK<sup>2</sup>

<sup>1</sup>Yozgat Bozok University, Graduate Education Institute, Department of Biology Yozgat Bozok University, Yozgat, Turkey

<sup>2\*</sup>Faculty of Arts and Science Department of Biology, Yozgat Bozok University, Yozgat, Turkey

Received 7 December 2025; revised 12 January 2026

Artemisinin is a natural compound that exhibits cytotoxic effects, particularly on cancer cells. This study investigated the effects of Artemisinin on the cytotoxic, genotoxic, and antioxidant enzyme activities of the human breast cancer cell line (MDA-MB-231) and the normal fibroblast cell line (L929) with molecular docking. Cells were treated with Artemisinin at concentrations of 12.5  $\mu\text{M}$ , 25  $\mu\text{M}$ , and 50  $\mu\text{M}$ . Cell viability was assessed using the MTT assay, DNA damage using the comet assay, and antioxidant enzyme activities (SOD, CAT, GPx) using the ELISA method. MTT analysis revealed a dose-dependent decrease in viability in MDA-MB-231 cells, with an LD<sub>50</sub> value determined to be 25  $\mu\text{M}$ . In L929 cells, viability was preserved up to 25  $\mu\text{M}$ , but a decrease was observed at 50  $\mu\text{M}$ . Comet assay results showed that DNA damage increased in a dose-dependent manner in MDA-MB-231 cells, while in L929 cells, significant damage occurred only at 50  $\mu\text{M}$ . Antioxidant enzyme analyses revealed significant decreases in SOD, CAT, and GPx activities in MDA-MB-231 cells, while no changes were observed in L929 cells at 25  $\mu\text{M}$ , and enzyme activities decreased at 50  $\mu\text{M}$ . Artemisinin produces cytotoxic and genotoxic effects in cancer cells with showed molecular docking parameter, while exhibiting lower toxicity at low concentrations in normal cells.

**Keywords:** Artemisinin, Breast Cancer, L929 cell line, Molecular docking, MTT Test, Antioxidant Test