



# Simultaneous effect of magnetic field and cisplatin drug on ovarian cancer

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## introduction

Ovarian cancer (OC) is one of the most common tumors in women worldwide and has the highest mortality rate. CisplatinDDP is the first platinum-based complex approved by the US Food and Drug Administration (FDA) for the treatment of patients with OC. Despite the good initial response rate, most patients who receive DDP treatment eventually develop resistance through various complex mechanisms that lead to treatment failure and increased mortality. Epidemiological studies show that there is usually a positive correlation between exposure There is an association between exposure to very low frequency electromagnetic fields and some types of cancer (although some other studies do not show any connection), which is of particular interest to biomedical and biophysical researchers around the world. To investigate the simultaneous effects of magnetic field and cisplatin drug on ovarian cancer in cellular and molecular scale.

## methods

Cell culture, use of magnetic field, cisplatin drug, MTT assay, investigation of cisplatin absorption in cells, statistical analysis.

## Results and discussion

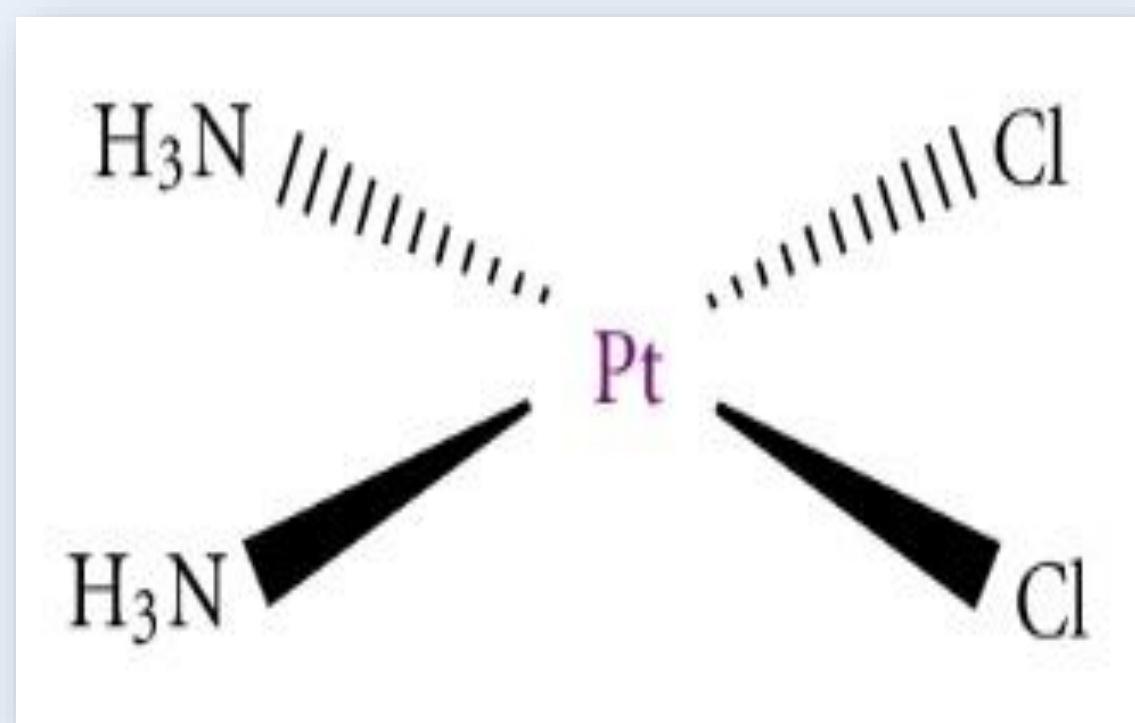
The effects of different intensities of static magnetic fields (SMFs) of 10, 15 and 25 mT and different concentrations of cisplatin drug have been investigated. In this study, increasing the concentration and time of cisplatin drug significantly decreased sensitive and resistant cell lines compared to the control group. It showed that these reductions were more significant in resistant cells compared to sensitive cells. Also, in another study, the potency of cisplatin increased by being exposed to magnetic fields of 60 Hz, 50 mT (due to changes in membrane permeability).

## Conclusion

The results of the studies conducted in the field of drug resistance pathways and the effects of very low frequency ELF magnetic fields show that there is a positive relationship between drug exposure to very low frequency electromagnetic fields and ovarian cancer.

**Keywords:** Ovarian cancer, Cisplatin, Magnetic fields, Cell culture

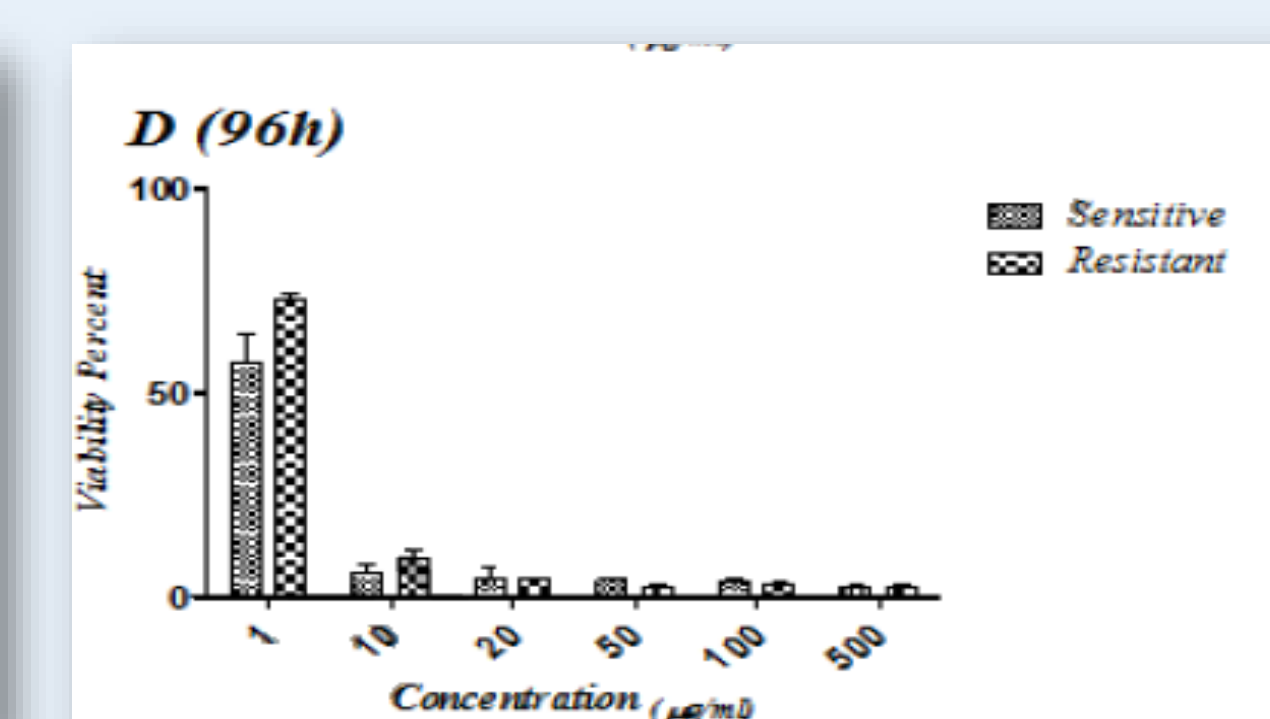
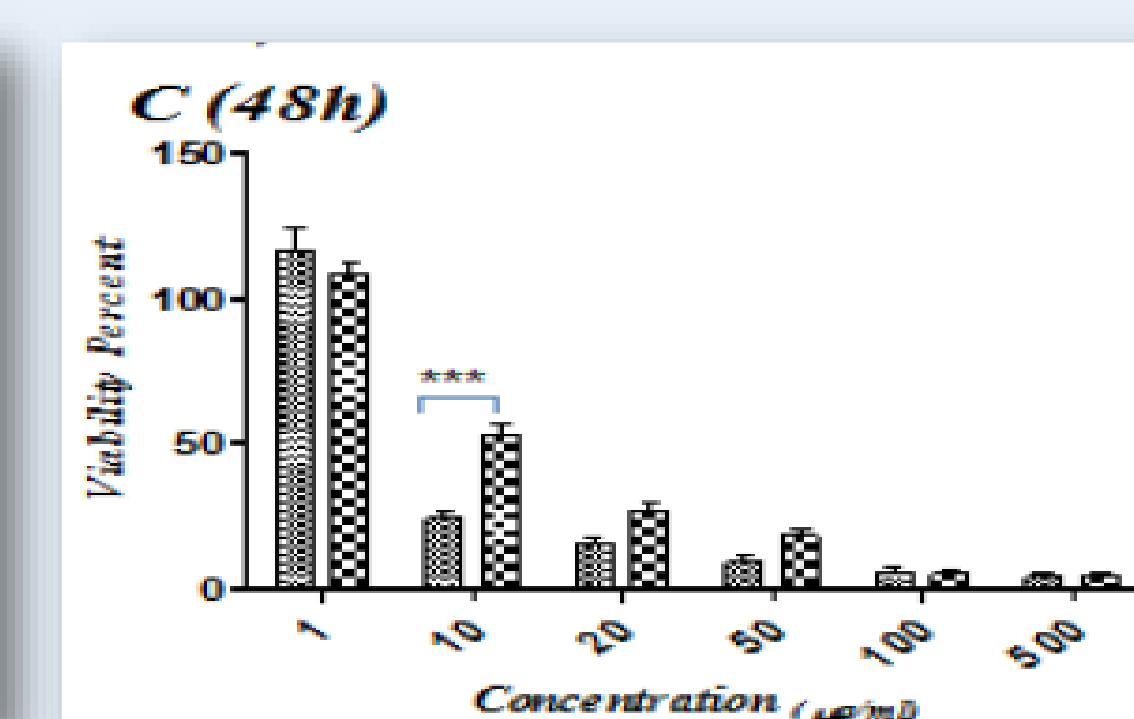
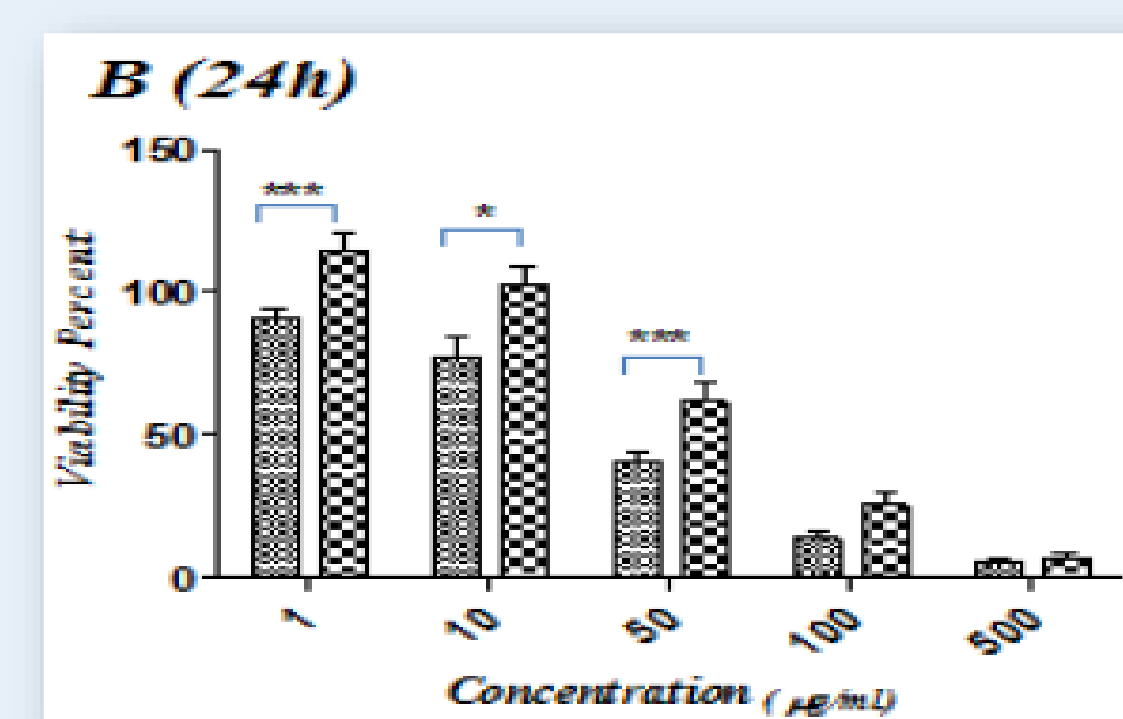
## Cis platin drug



- Cisplatin is a metallic coordination compound
- one of the most potent antitumor
- This compound acts as a DNA damaging
- used for the treatment ovarian, testicular and lung cancer, neuroblastoma

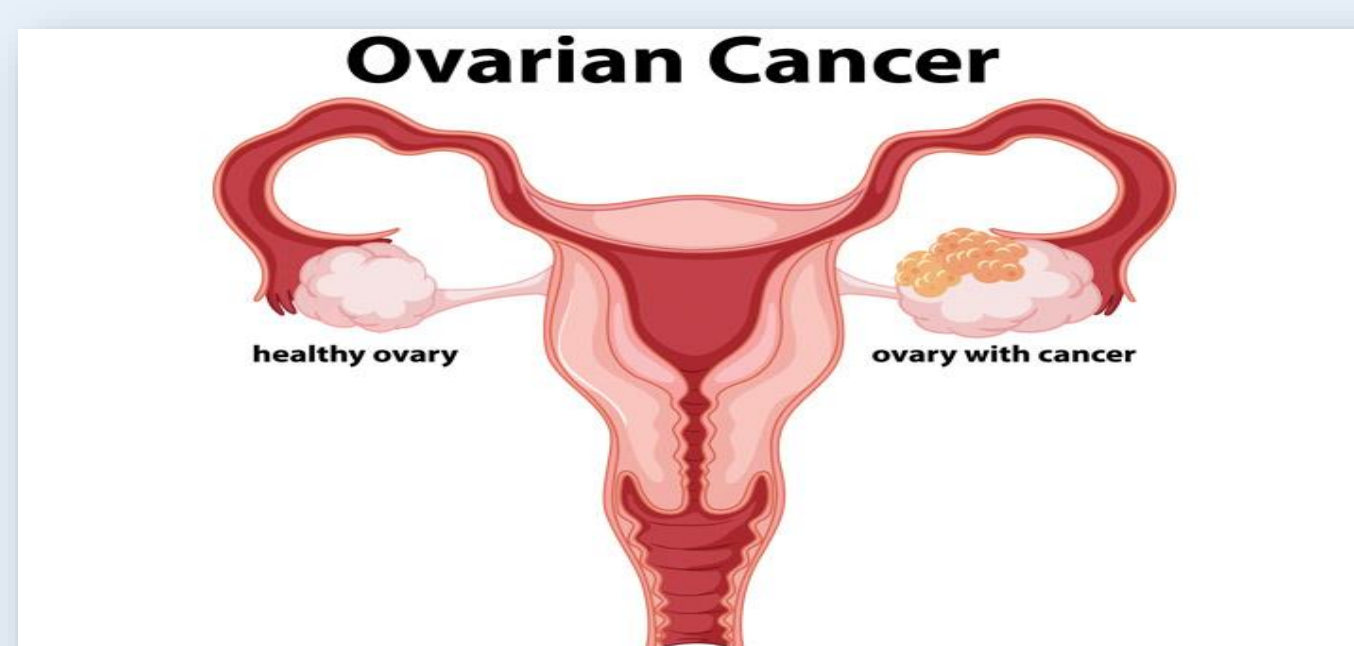
## Effect of different concentration of cisplatin on cell viability

Increasing of concentration and time of cisplatin treatment exhibited a marked decrease in viability percent in sensitive cells compared with resistant cells.



different concentrations (1, 10, 50, 100 and 500 µg/ml) of cisplatin at 24 (B), 48 (C) and 96 hours (D)

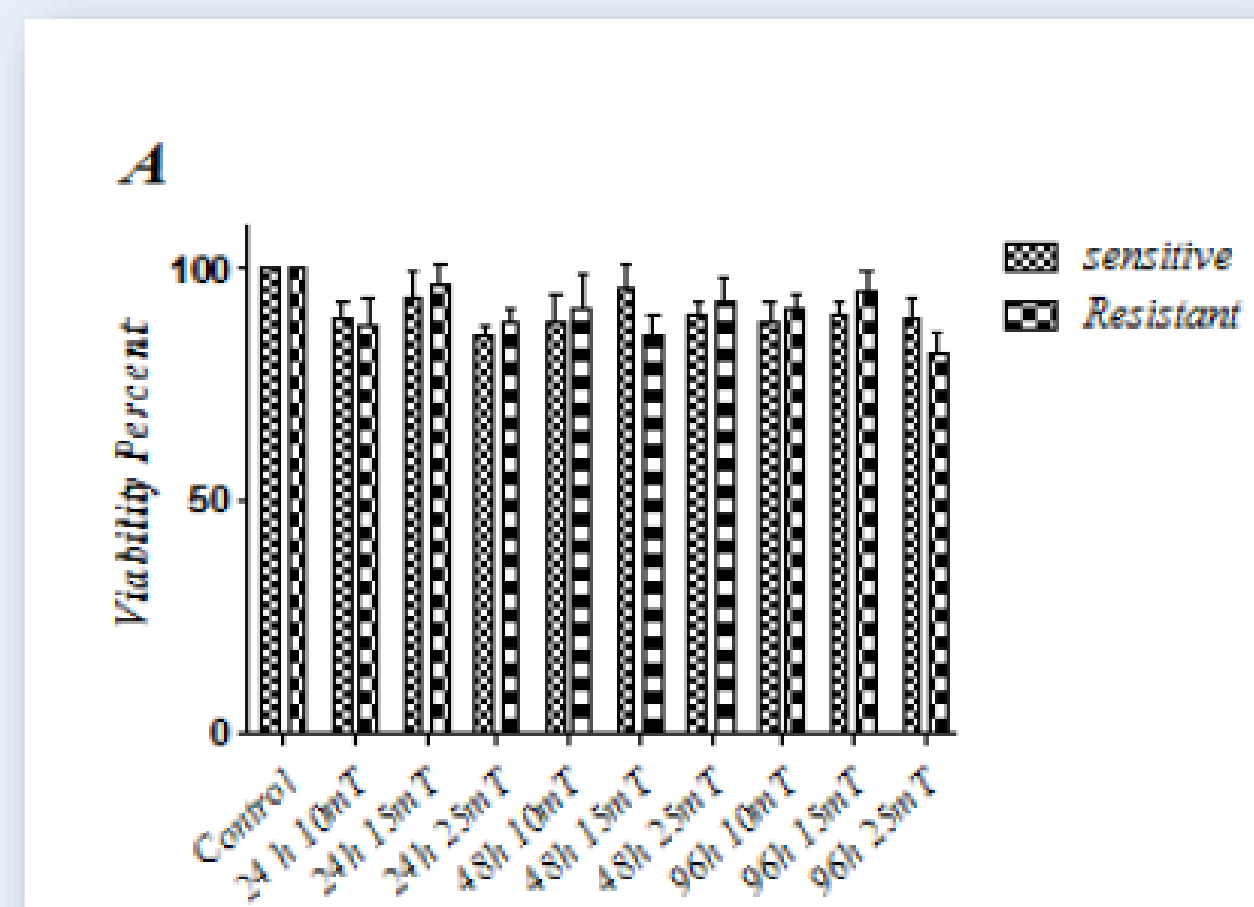
## Ovarian cancer and a suggestion for its treatment



- Ovarian cancer (OC) is one of the most common tumors in women worldwide and has the highest mortality rate.
- Cisplatin DDP is the first platinum-based complex approved by the US Food and Drug Administration (FDA) for the treatment of patients with OC

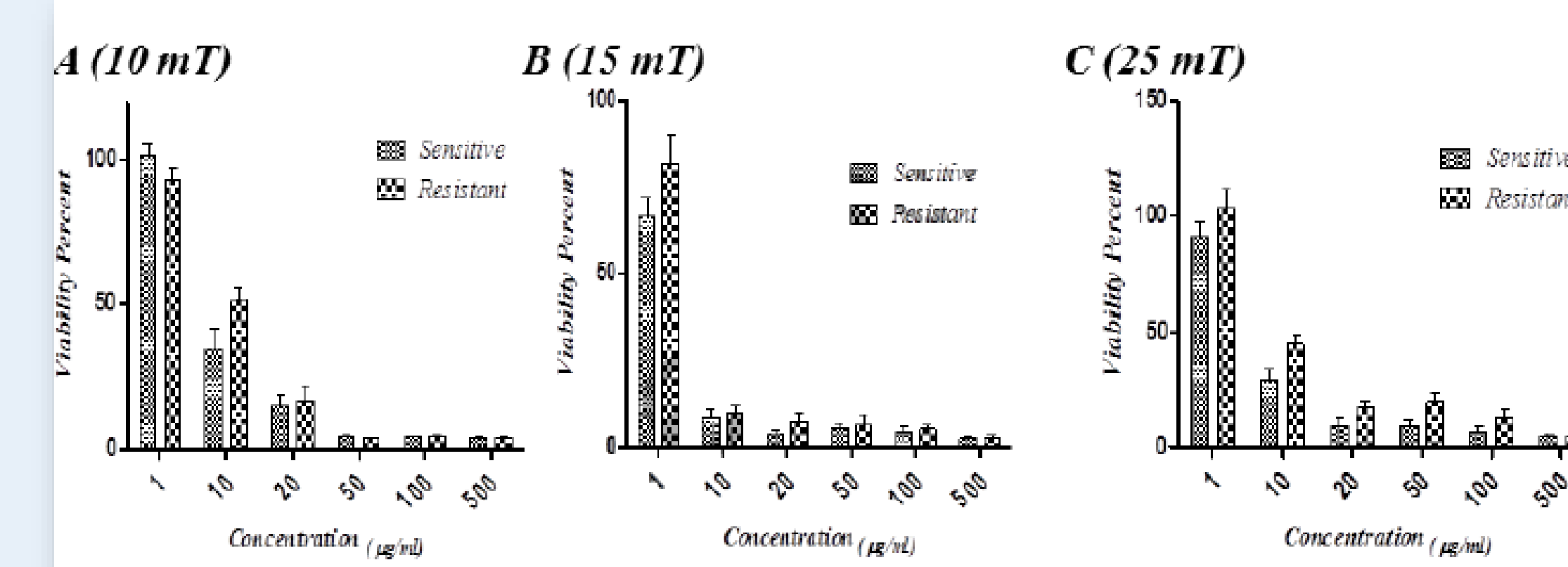
## Effect of SMF on cell viability

- SMF did not changed cell viability percent in sensitive and A2780-CP cells and there was not a significant difference between the two cell lines



## Simultaneous effect of SMF and cisplatin on cell viability

- The most significant decrease in cell viability percent was observed in the group exposed to 25 mT SMF for 96 h and treated with 500 µM for 96 h.



## conclusion

- A2780 cells were more sensitive to cisplatin than A2780-CP
- SMF can increase the effect of cisplatin on cell viability
- SMF decreases the resistance of A2780-CP cells by producing large, verruca shaped structures at the surface of the cell membrane

## References

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