SILVER(I) COMPLEXES AS POTENTIAL ANTICANCER DRUGS: SYNTHESIS, CHARACTERIZATION, AND *IN VITRO* STUDIES

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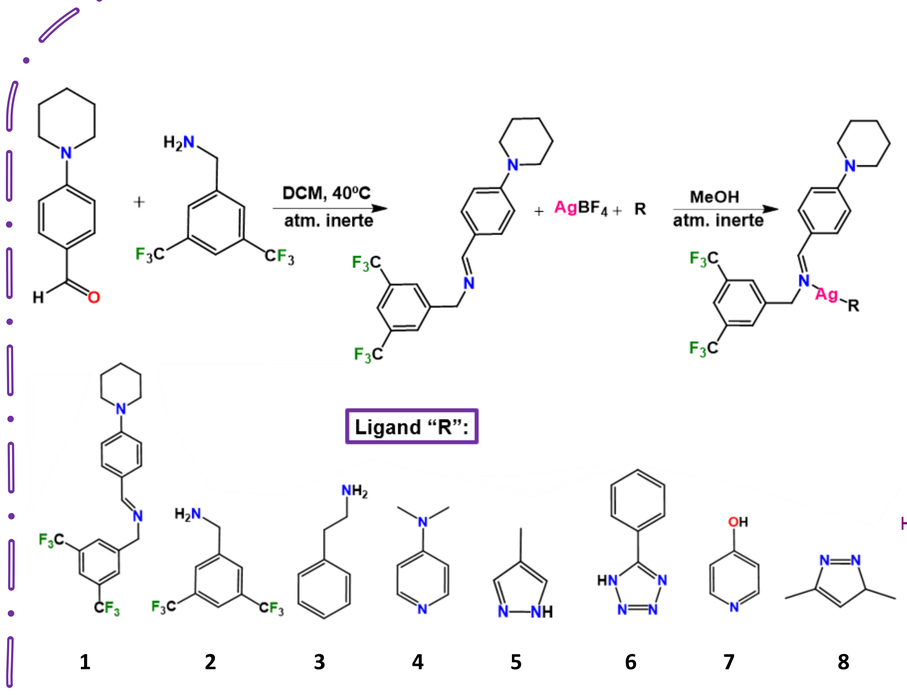
INTRODUCTION

The search for new drugs to treat cancer is a social imperative, given the high mortality rate of this disease. In 1845, the discovery of cisplatin for the treatment of testicular cancer revolutionized science and encouraged the incorporation of metals into drugs. These metal complexes offer advantages over organic drugs because many organic molecules change their pharmacological and toxicological properties when coordinated to metal centers. However, the undesirable effects of the complexes discovered so far are a major problem to be solved.[1] In this regard, the discovery of less toxic and more selective drugs that allow dose reduction is of great importance.

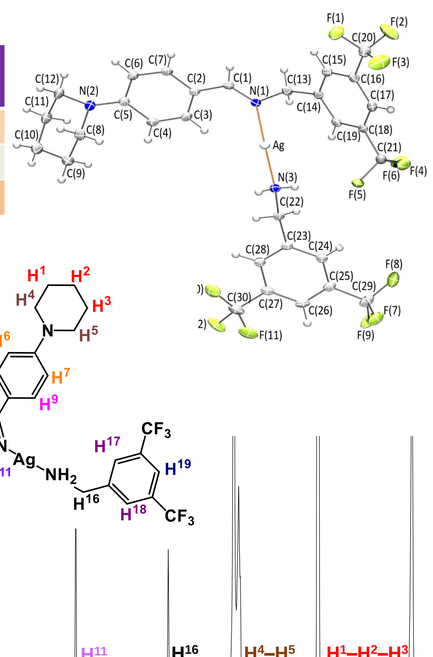
Silver(I) metal complexes have been of interest in cancer research due to their antitumor, bactericidal, and antifungal properties. These compounds have shown antiproliferative activity in a variety of cancer cell lines due to their ability to induce apoptosis. Some have even been compared favorably with widely used chemotherapeutic drugs.[2]

The objetive of this study is the development of a new family of silver(I) with nitrogen donor ligands that show antitumour properties and verify the mechanism of action by which this compounds generate cell death.

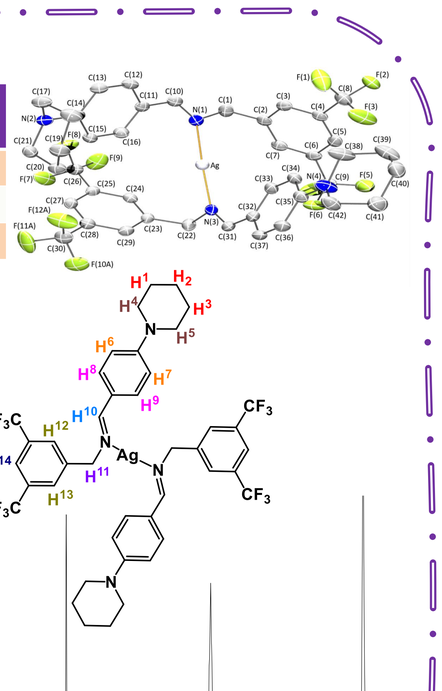
SYNTHESIS AND CHARACTERIZATION



Selected bond lengths (Å) and angles (º) of complex 1	
Ag-N1	2.1286(14)
Ag-N3	2.1313(14)
N1-Ag-N3	177.26(6)



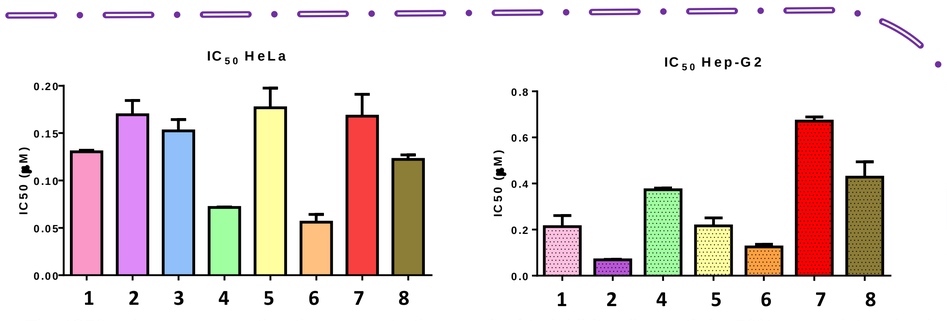
Selected bond lengths (Å) and angles (º) of complex 2	
Ag-N1	2.139(3)
Ag-N3	2.127(3)
N1-Ag-N3	170.98(10)



IN VITRO STUDIES

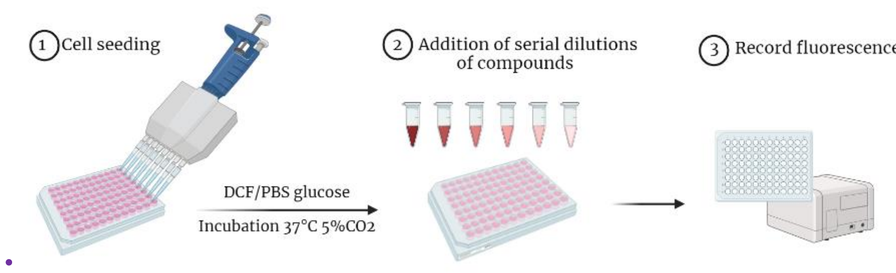
MTT ASSAY

HeLa or Hep-G2
Tumor cell lines used in the assay

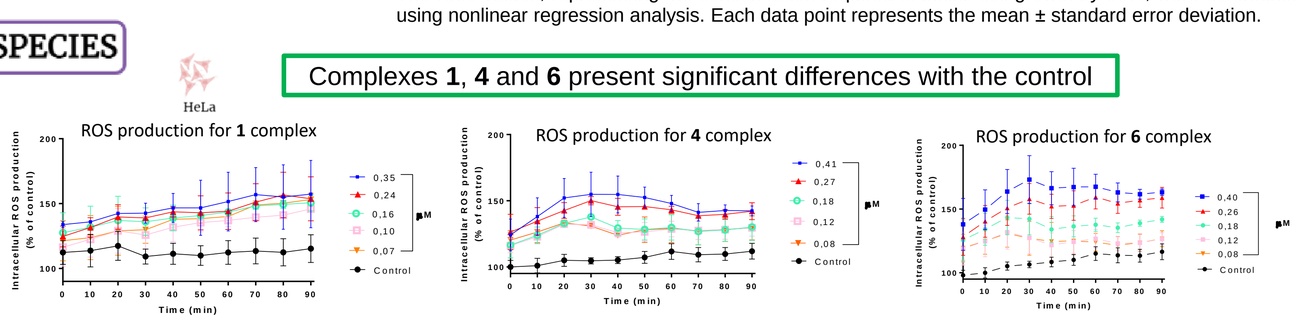


The IC50 values, representing the concentration required to inhibit cell growth by 50%, were determined using nonlinear regression analysis. Each data point represents the mean ± standard error deviation.

MEASUREMENT OF THE GENERATION OF REACTIVE OXYGEN SPECIES



Complexes 1, 4 and 6 present significant differences with the control



Production of ROS in HeLa cells treated with the three most promising compounds from the cytotoxicity assay. Data are expressed as percentage over control cells.[3]

CONCLUSIONS

- ✓ **Eight new silver(I) complexes have been synthesized from a new imine and monodentate ligands with biological activity.**
- ✓ **All silver(I) metal complexes have antitumor activity against the two cell lines.**
- ✓ **According to the IC_{50}, complex 6 presents a higher potency, and complex 2 seems to be selective to the Hep-G2 tumor line.**
- ✓ **Some of the metal complexes present a possible mechanism of action due to the generation of reactive oxygen species.**

REFERENCES

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ACKNOWLEDGEMENTS

Acknowledgements: We thank the MCIU/AEI/FEDER-(PID2021-122406NB-100), Gobierno de Aragón (E05-23R and B44_23R) and CUD (CUD-2023_04) for financial support.