

Nanoparticle Systems for Improved Delivery of *Plectranthus*-Derived Abietane Diterpenoids in Breast Cancer Therapy

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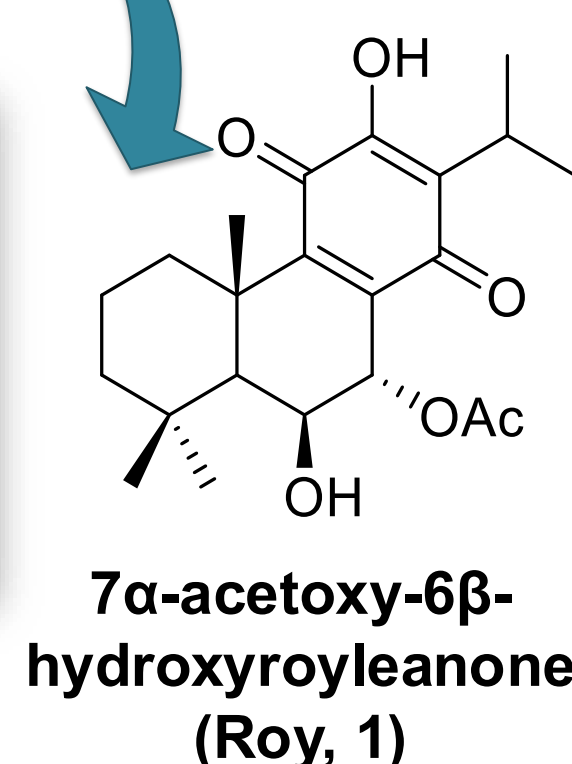
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INTRODUCTION & AIM

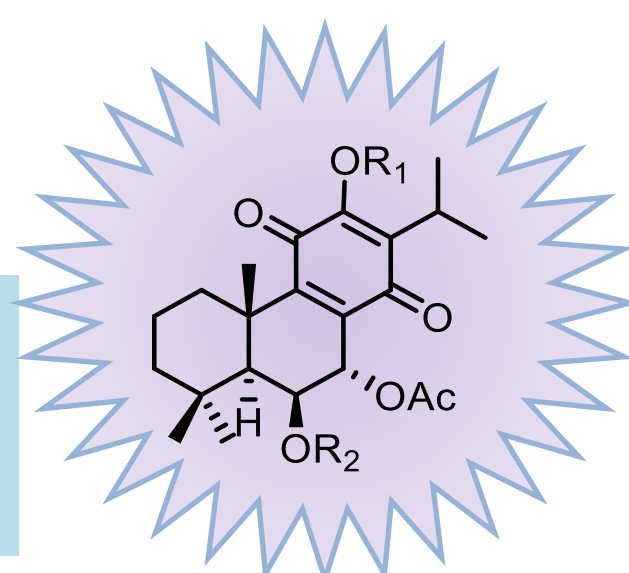
Plectranthus genus (Lamiaceae) - Source of cytotoxic abietane compounds.



P. madagascariensis
(Pers.) Benth



Royleanones are cytotoxic against several cancer cell lines. However, compounds have very low water-solubility.

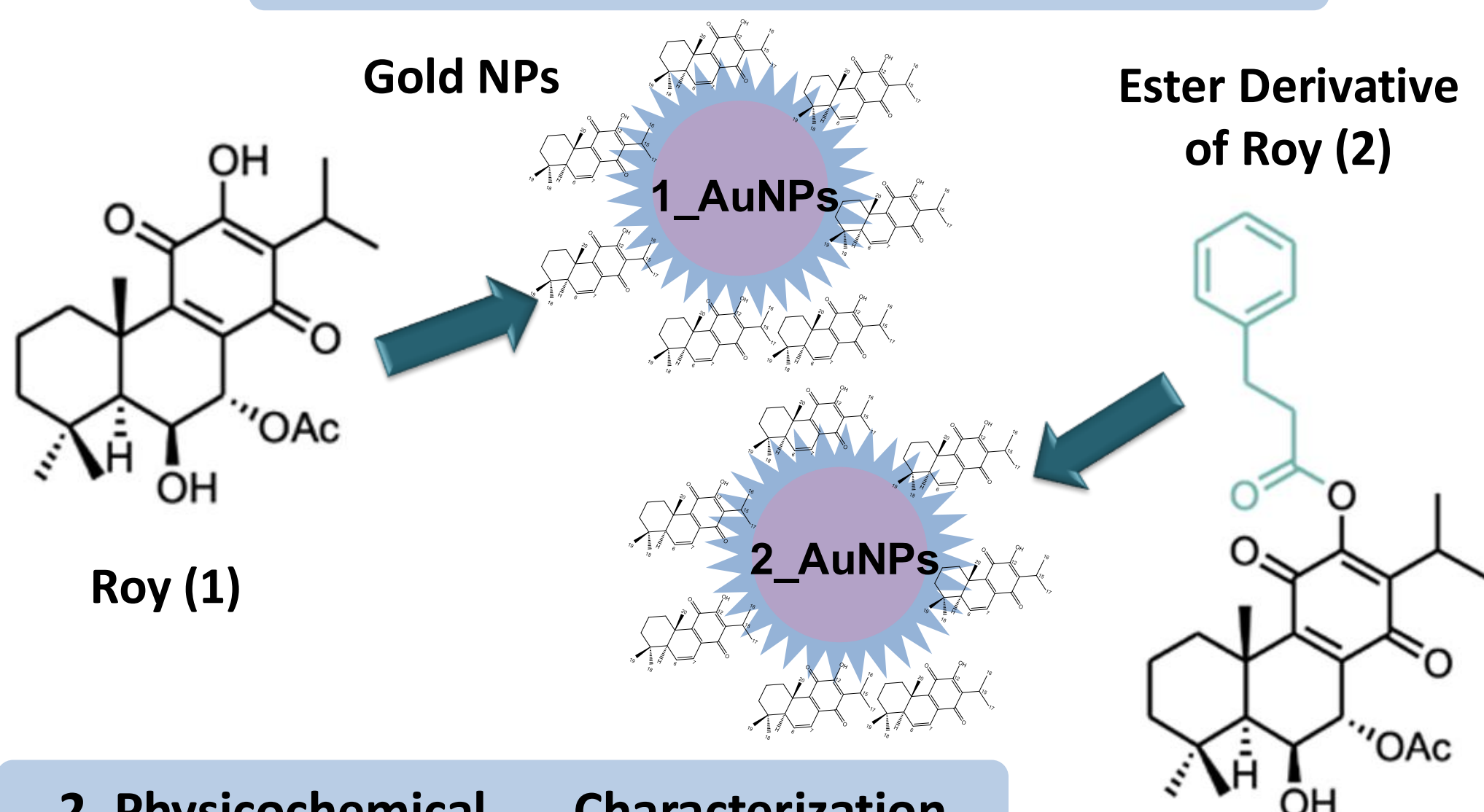


Nanotechnology can be a possible solution to improve drug solubility and targeted delivery without undesirable side effects.

In this work, the cytotoxic royleanone, **Roy**, and its ester derivative, were used to prepare gold nanoparticle formulations, to enhance the cytotoxic potential of these drug candidates.

METHOD

1. Gold Nanoparticles (AuNPs) preparation

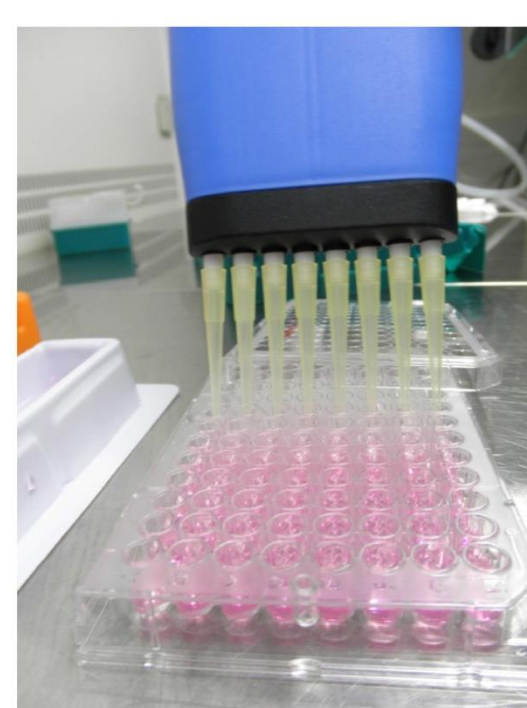


2. Physicochemical Characterization

AuNPs evaluated for particle size, polydispersity index (PDI), surface charge (zeta potential), and drug encapsulation efficiency

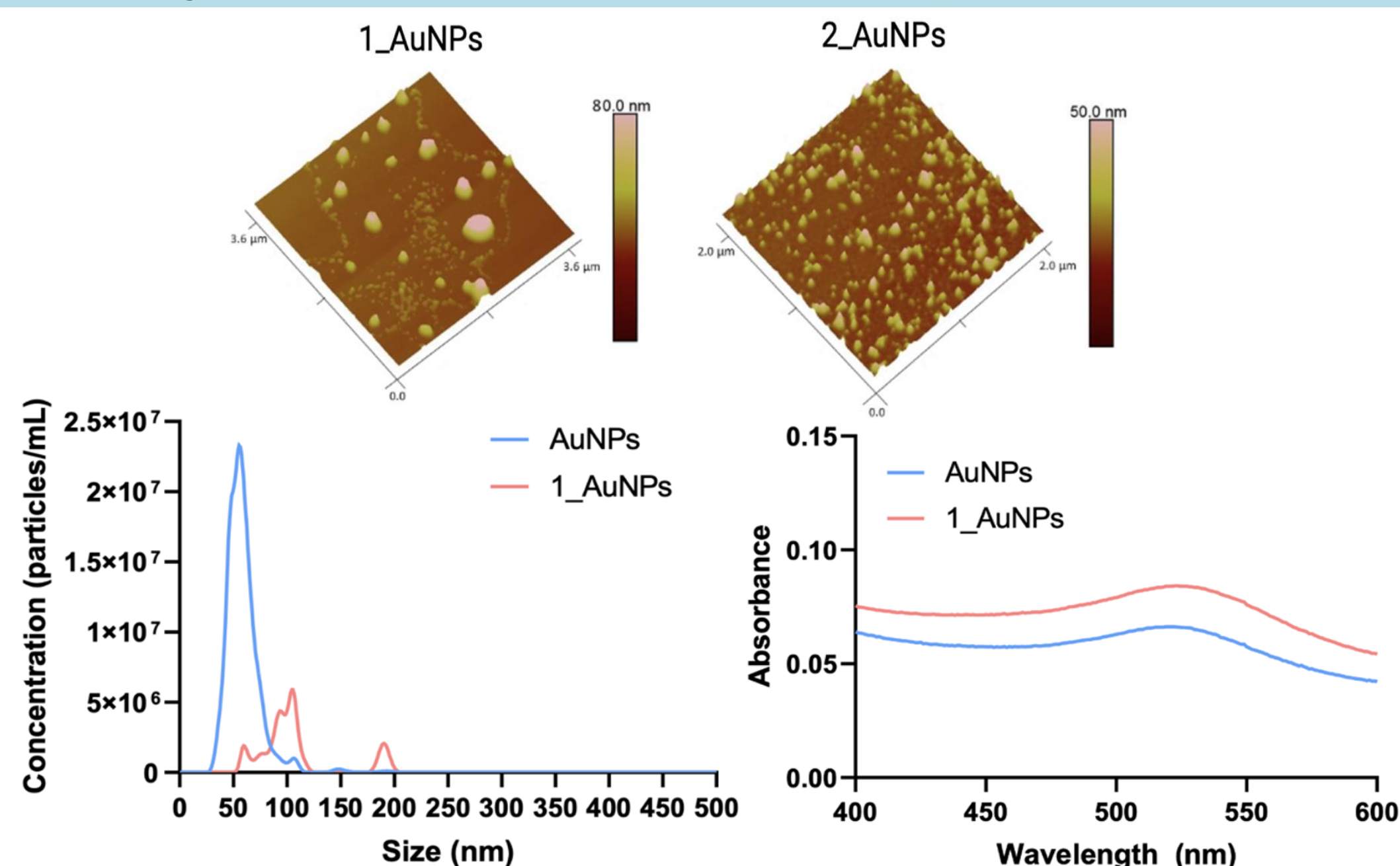
3. Cytotoxicity Evaluation

Evaluation on breast cancer cell lines MDA-MB-231, 4T1, and MCF7 and normal cells HDF

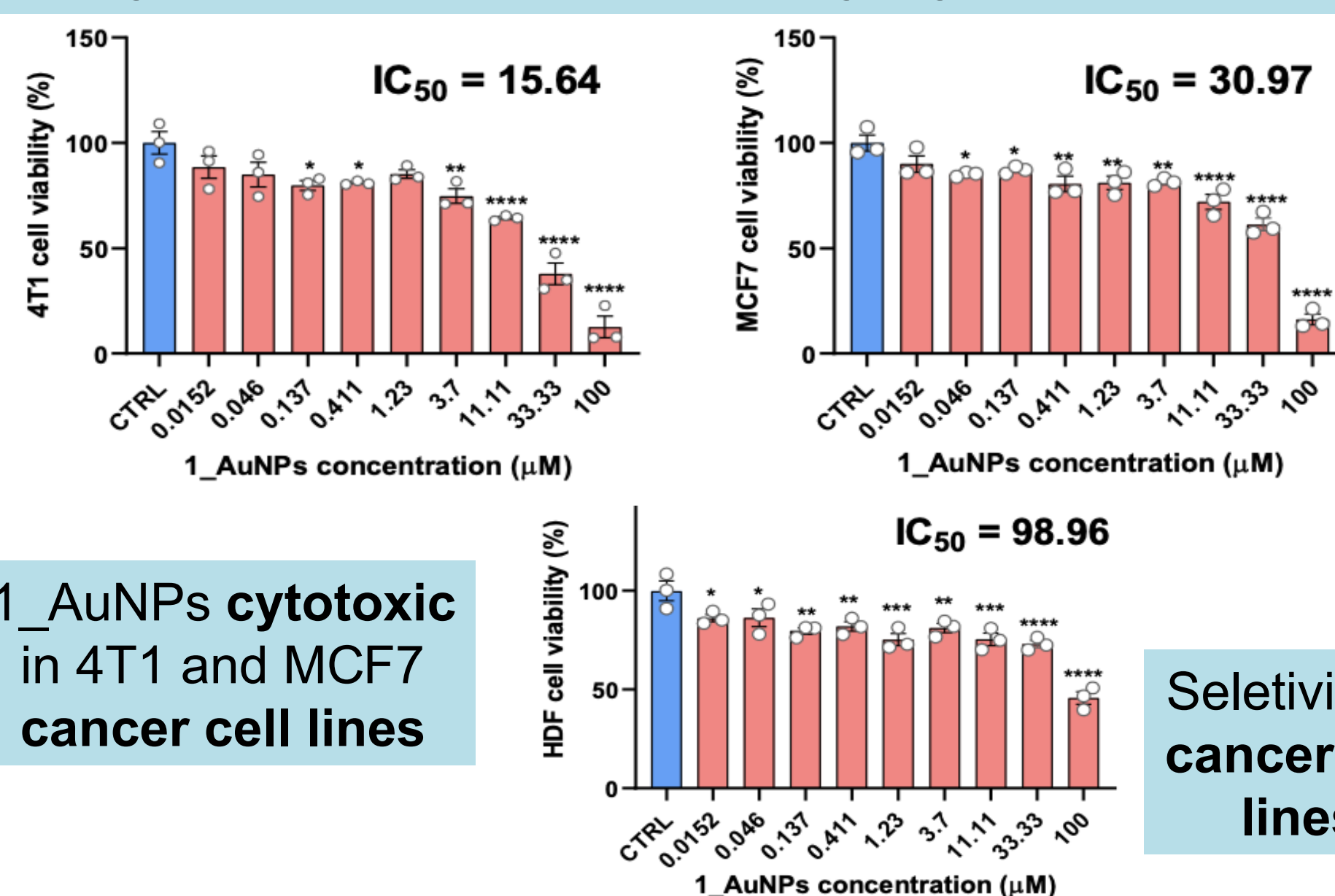


RESULTS & DISCUSSION

AFM images revealed particles with **spherical** shapes for 1_AuNPs



Average size of conjugated 1_AuNPs and unconjugated AuNPs using NTA; UV-VIS spectra showing slight shift in absorbance.



1_AuNPs cytotoxic in 4T1 and MCF7 cancer cell lines

Selectivity to cancer cell lines

CONCLUSION

- ✓ Nanosystems using natural and semi-synthetic royleanones successfully prepared
- ✓ 1_AuNPs sustained **cytotoxic** activity of Roy when assessed in cancer cell lines
- ✓ 1_AuNPs are **selective** against cancer cells, while sparing normal HDFs cells

REFERENCES & ACKNOWLEDGMENTS

- [1] Garcia, C. et al. 2018, Future Med Chem, 1 (10), 1177.
[2] Ntungwe, E. et al. 2021, Int J Mol Sci, 22 (19).

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