

Supporting Information

Dinuclear Organoruthenium Complexes Exhibit Antiproliferative Activity through DNA Damage and ROS-mediated ER Stress Pathway

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Table of Contents:

¹ H, ¹³ C NMR and ESI-MS spectra.....	2
UV-Vis spectra and the stability of complexes 1-4 (25 μM) in 5% CH ₃ OH/95% H ₂ O.....	8
Dose-dependent drug efficacy for complexes 1-4 and cisplatin on cancer cells.....	9
AFM images of pBR322 plasmid DNA treated with complexes 1-4	10
Analysis of ROS levels by flow cytometry.	11
ROS levels induced by complex 4 in the presence of SOD, TBA and NAC.....	12
Cell cycle distribution of A549 cells and A549/Cis Cells.....	13
Flow cytometry analysis for apoptosis of Cells treated with complex 4 with and without NAC.....	14
Absorption spectroscopic properties of complexes 1-4 on binding to DNA.....	15

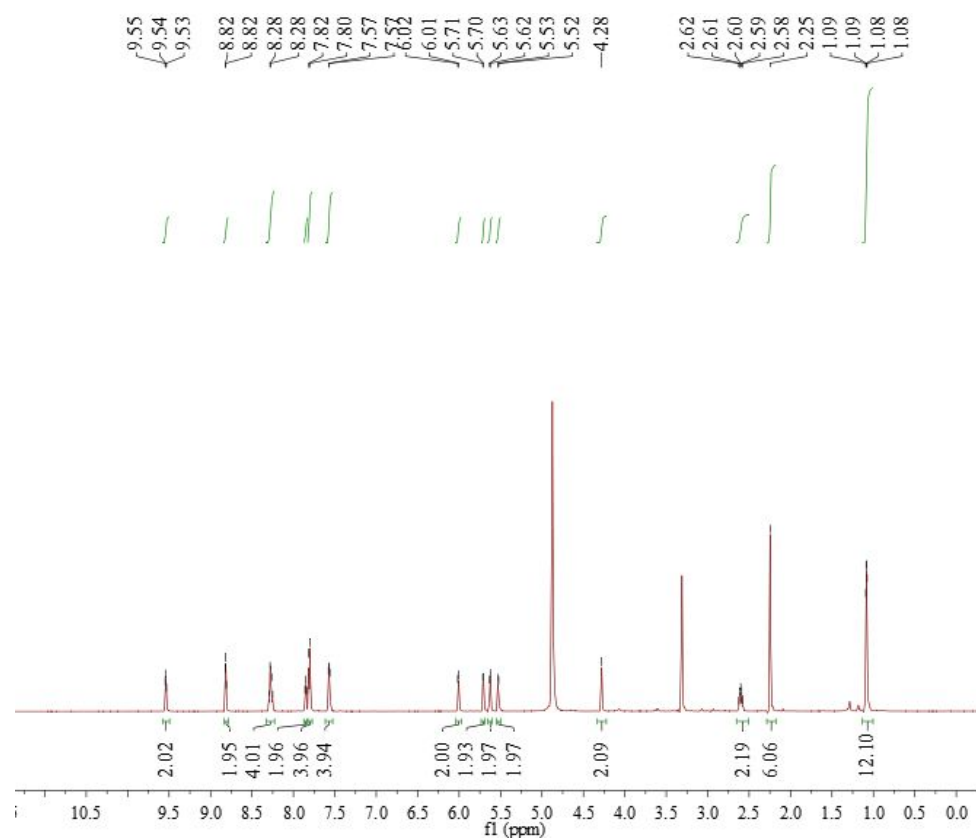


Figure S1. ¹H NMR spectrum of complex 1.

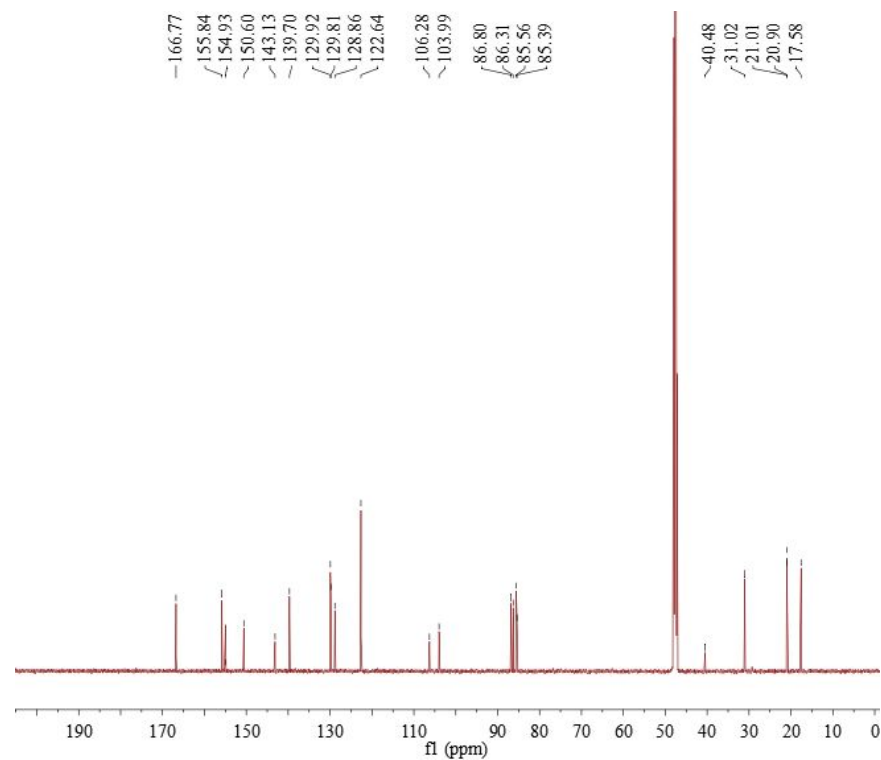


Figure S2. ¹³C NMR spectrum of complex 2.

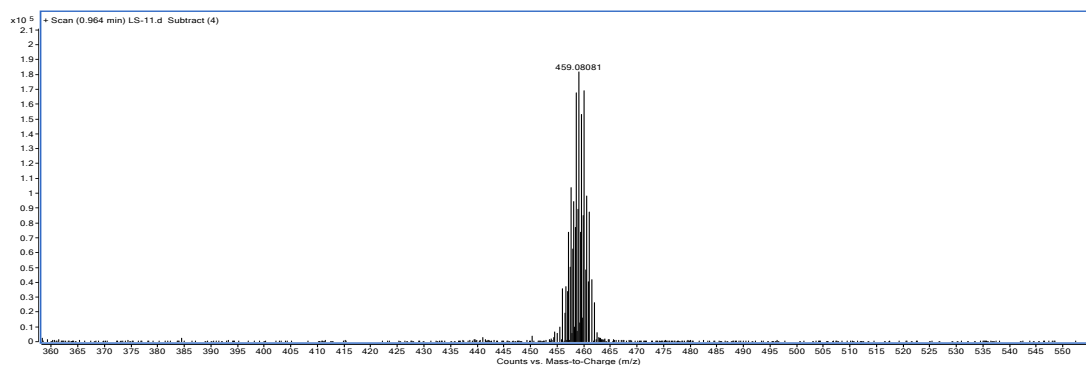


Figure S3. ESI-MS mass spectrum of complex 1.

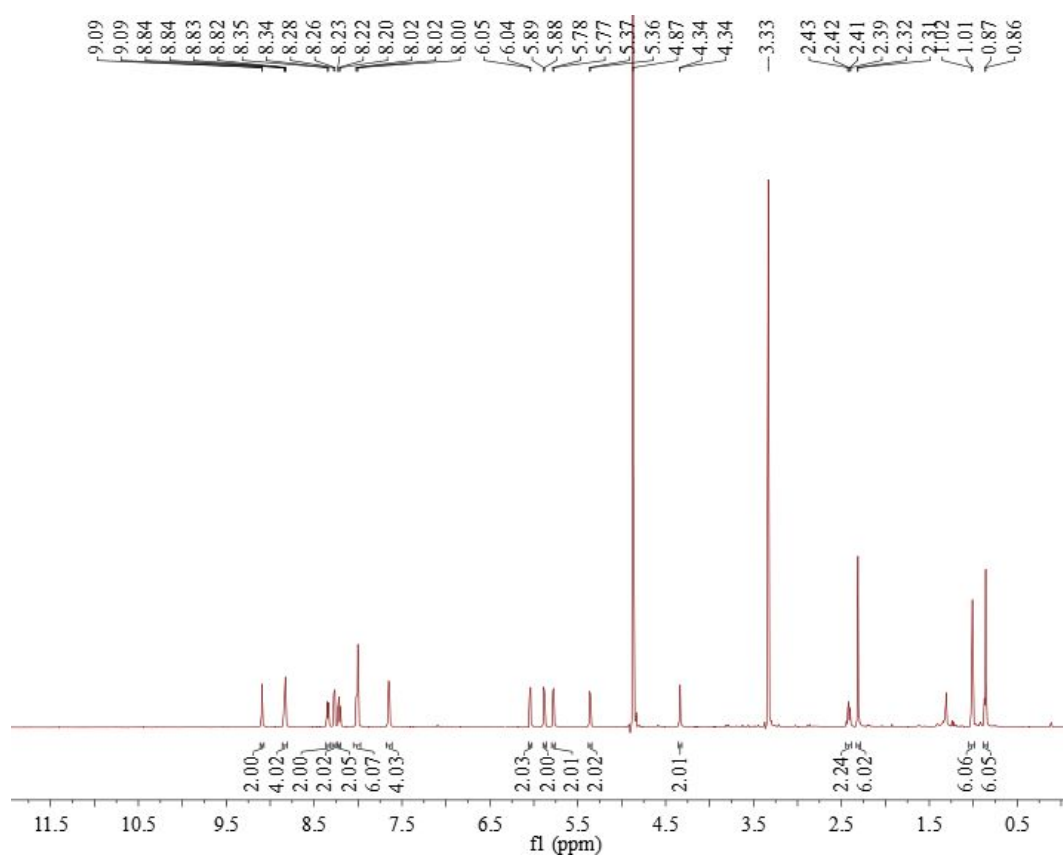


Figure S4. ^1H NMR spectrum of complex 2.

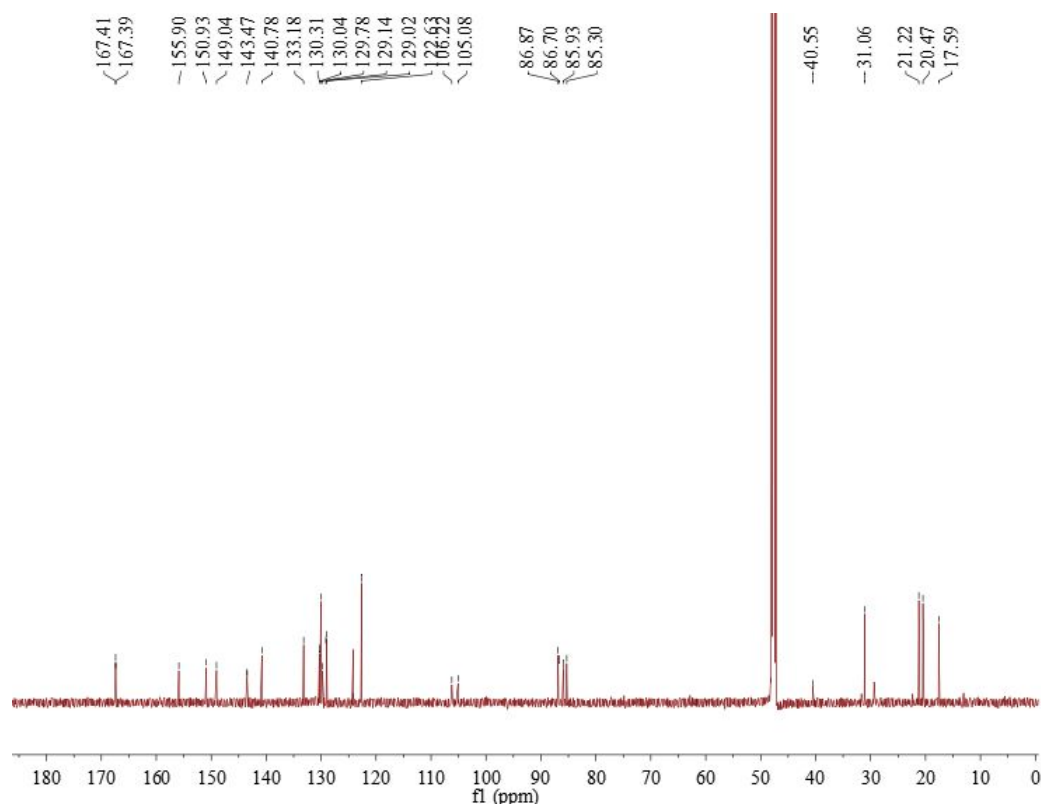


Figure S5. ¹³C NMR spectrum of complex 2.

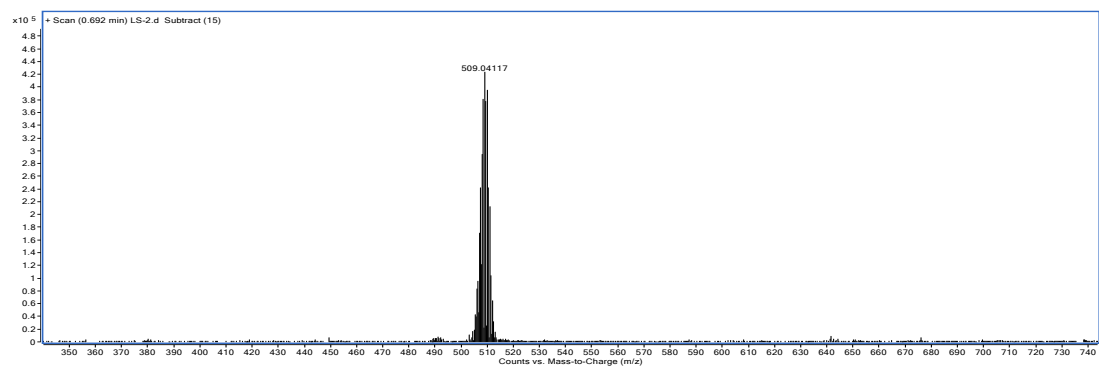


Figure S6. ESI-MS mass spectrum of complex 2.

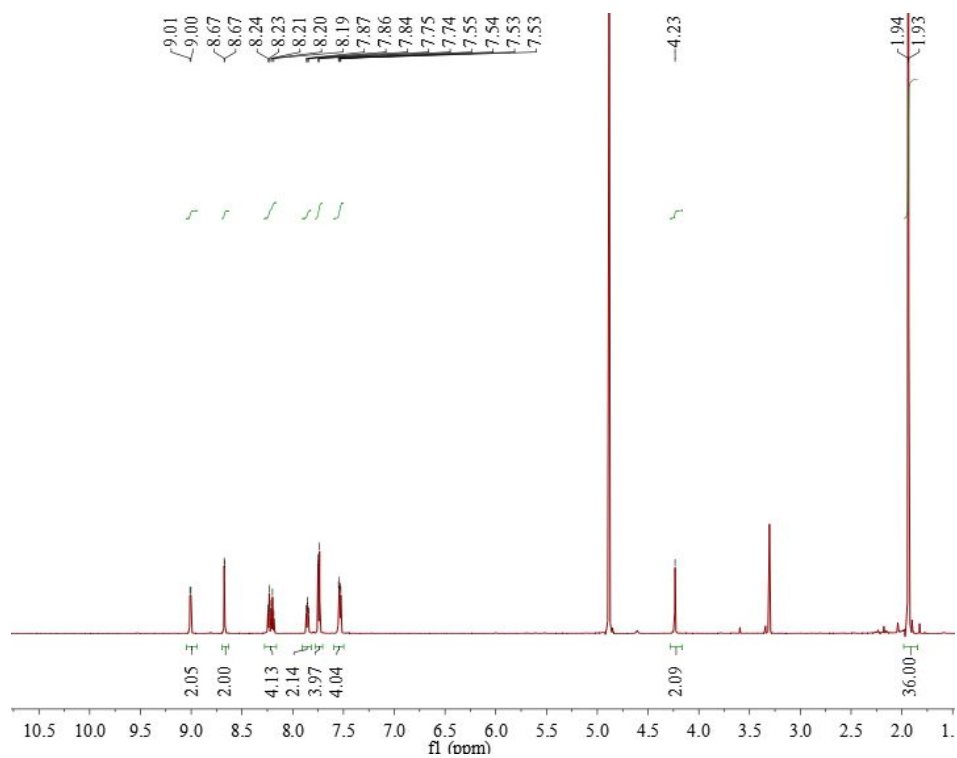


Figure S7. ¹H NMR spectrum of complex **3**.

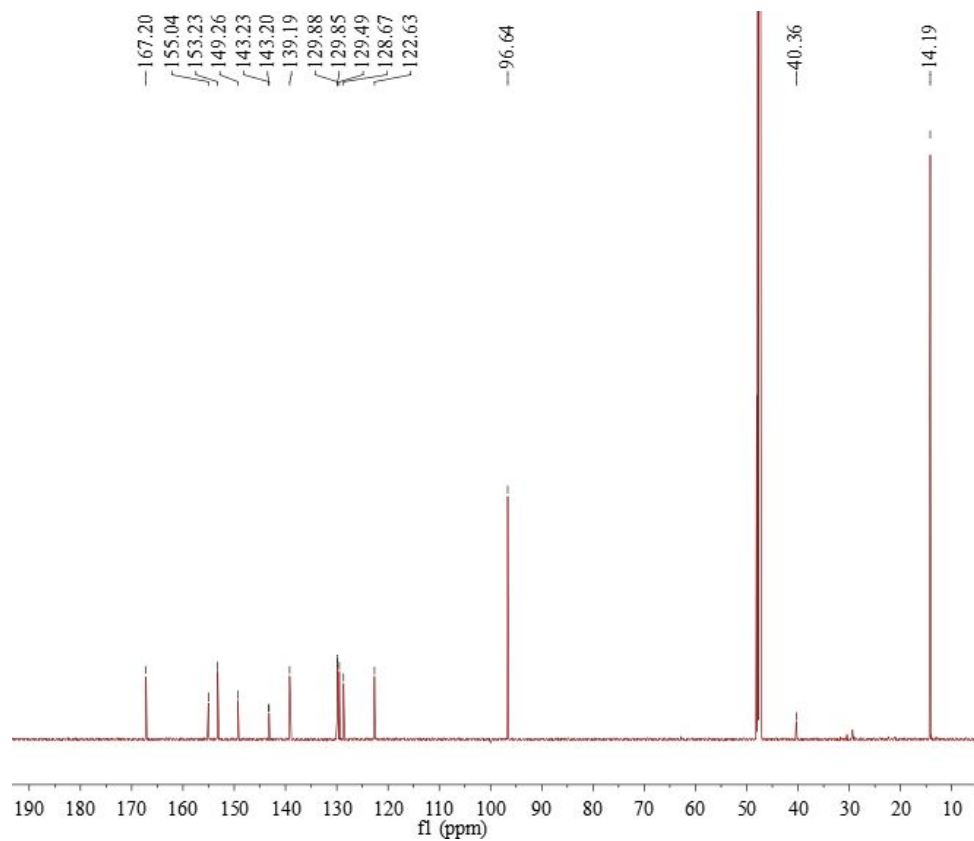
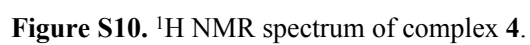
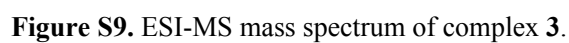


Figure S8. ¹³C NMR spectrum of complex **3**.



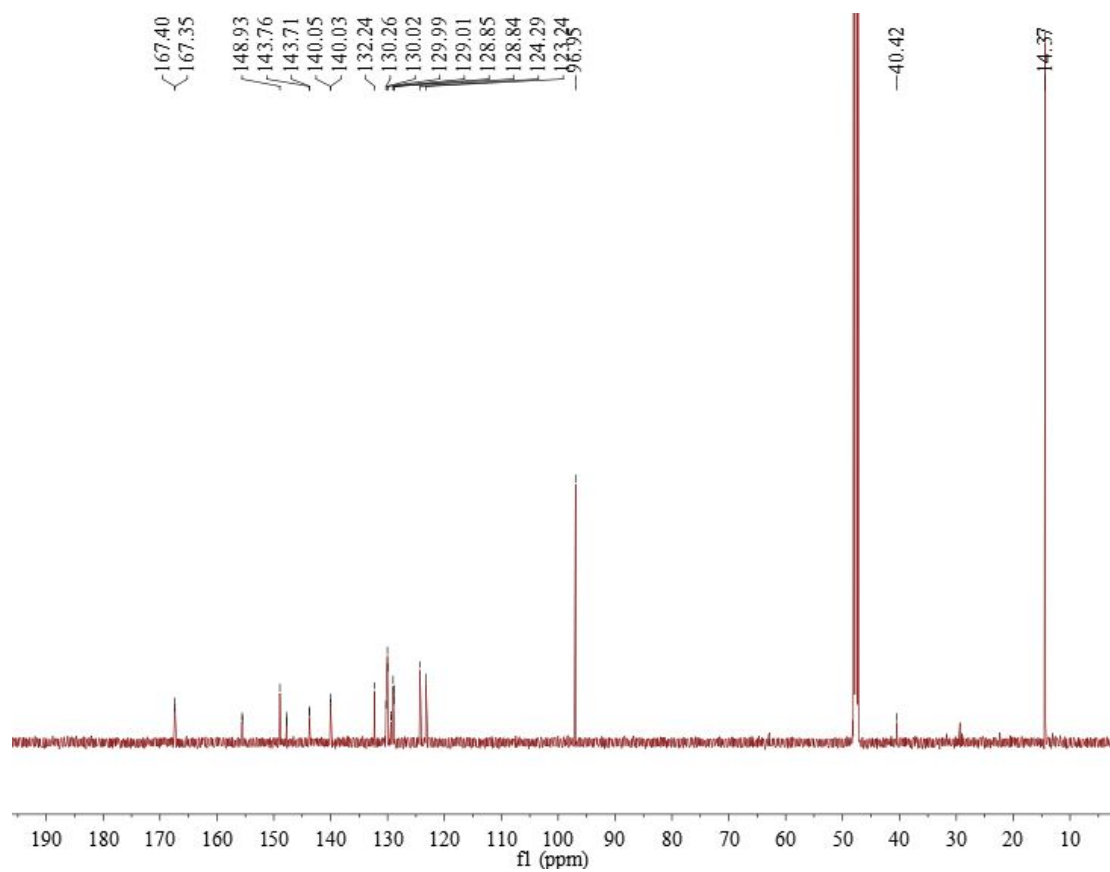


Figure S11. ¹³C NMR spectrum of complex 4.

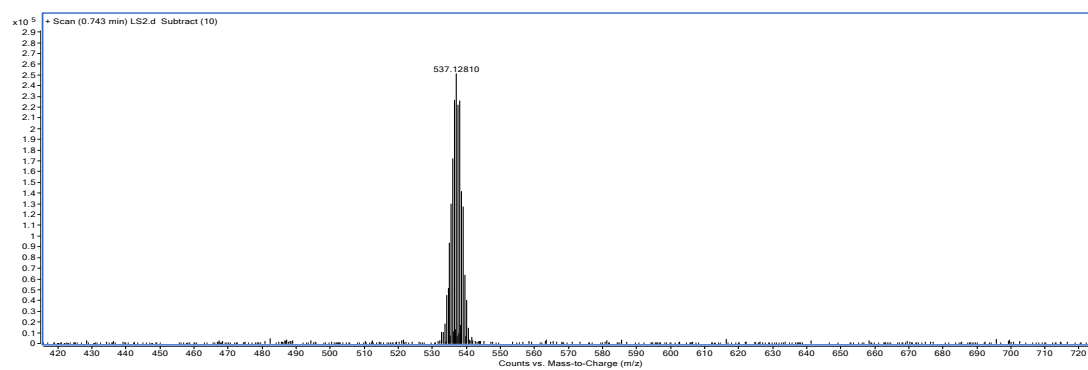


Figure S12. ESI-MS mass spectrum of complex 4.

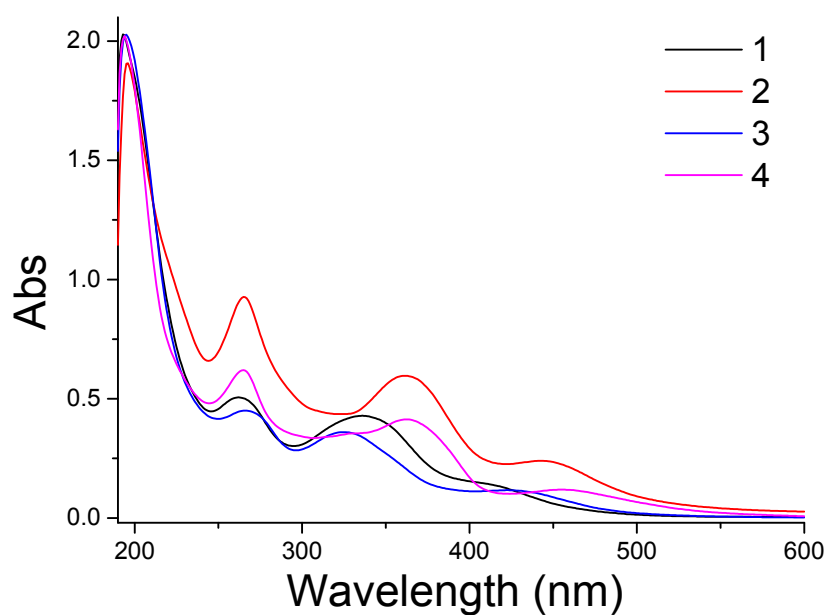


Figure S13. UV-Visible absorbance spectra of complexes **1–4** (25 μ M) in 5% CH₃OH/95% H₂O at 310 K.

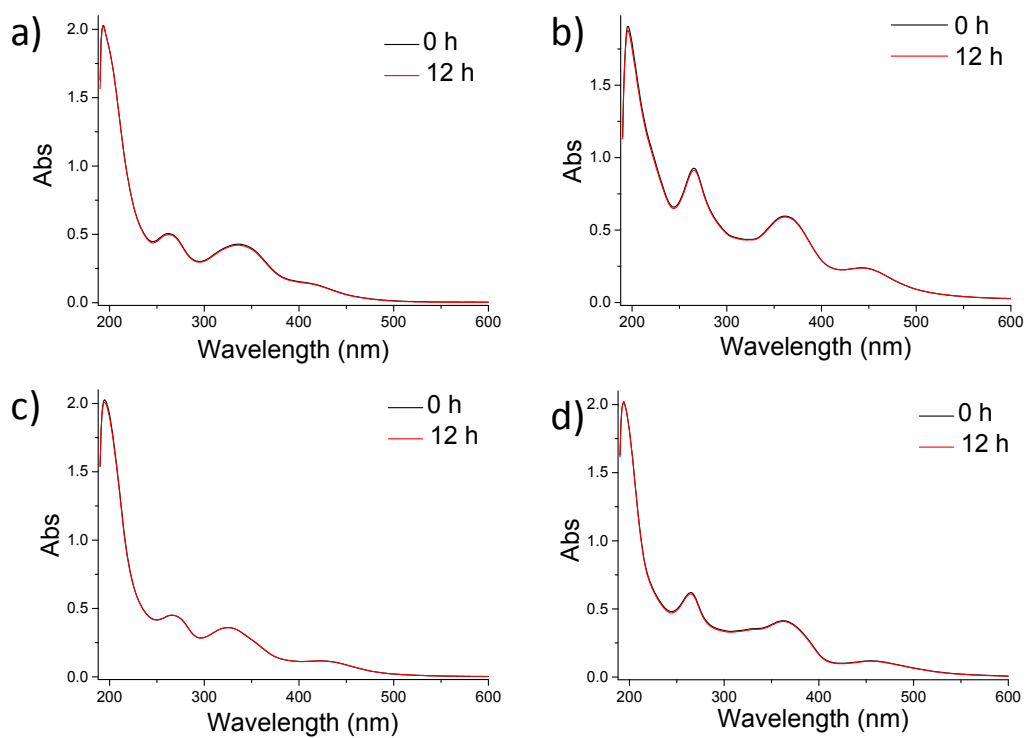


Figure S14. UV-Vis spectra of complexes **1–4** (25 μ M) in 5% CH₃OH/95% H₂O recorded at different times over 12 h of incubation at 310 K: (a) complex **1**; (b) complex **2**; (c) complex **3**; (d) complex **4**.

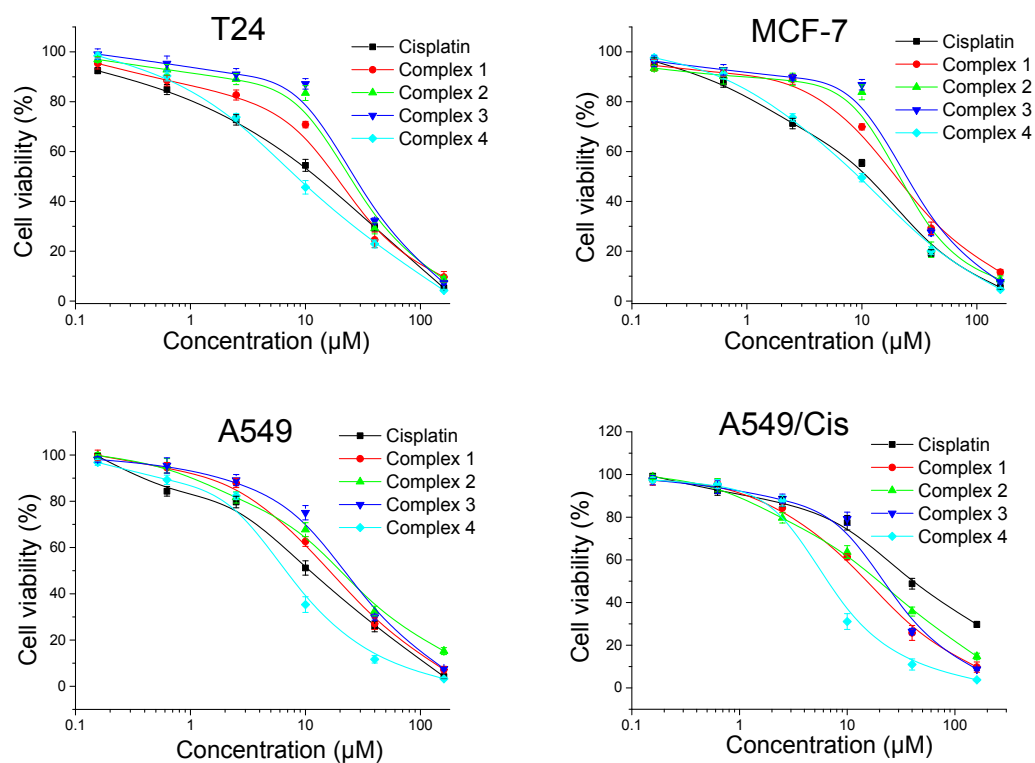


Figure S15. Dose-dependent drug efficacy for complexes **1-4** and cisplatin on tumor cells. Data are expressed as the mean ($\pm$ SD) for three independent experiments.

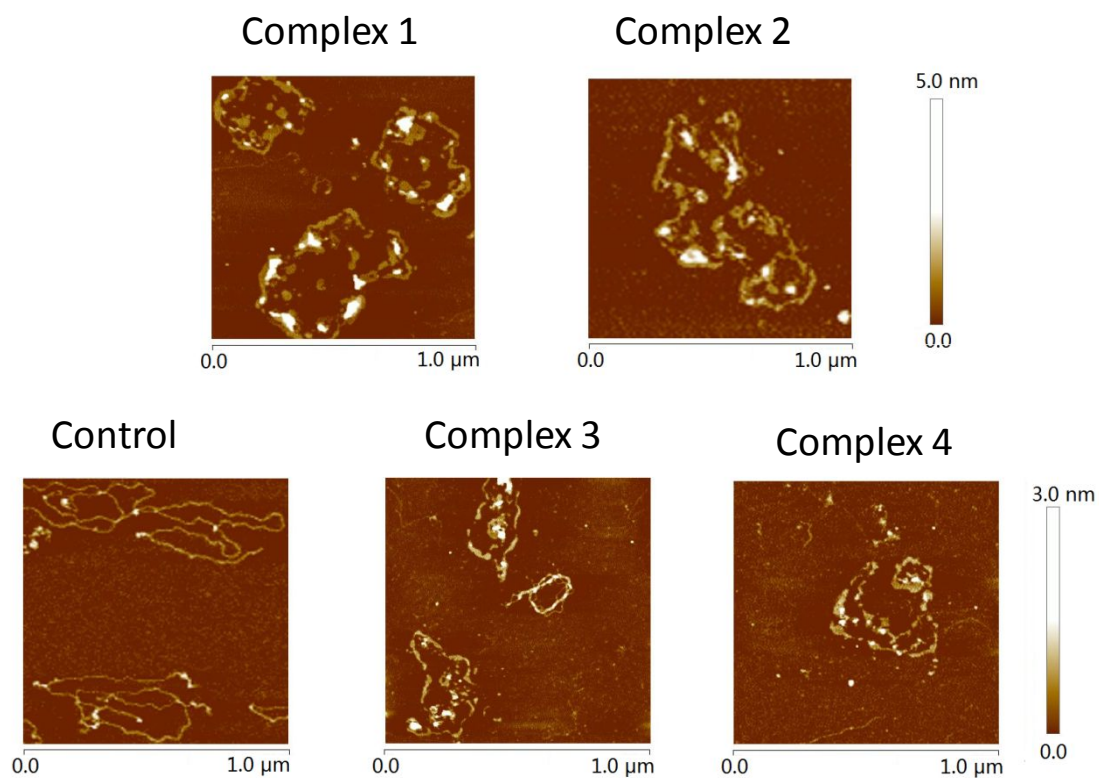


Figure S16. AFM images of pBR322 plasmid DNA treated with complexes **1-4** in HEPES buffer adsorbed on peeled mica.

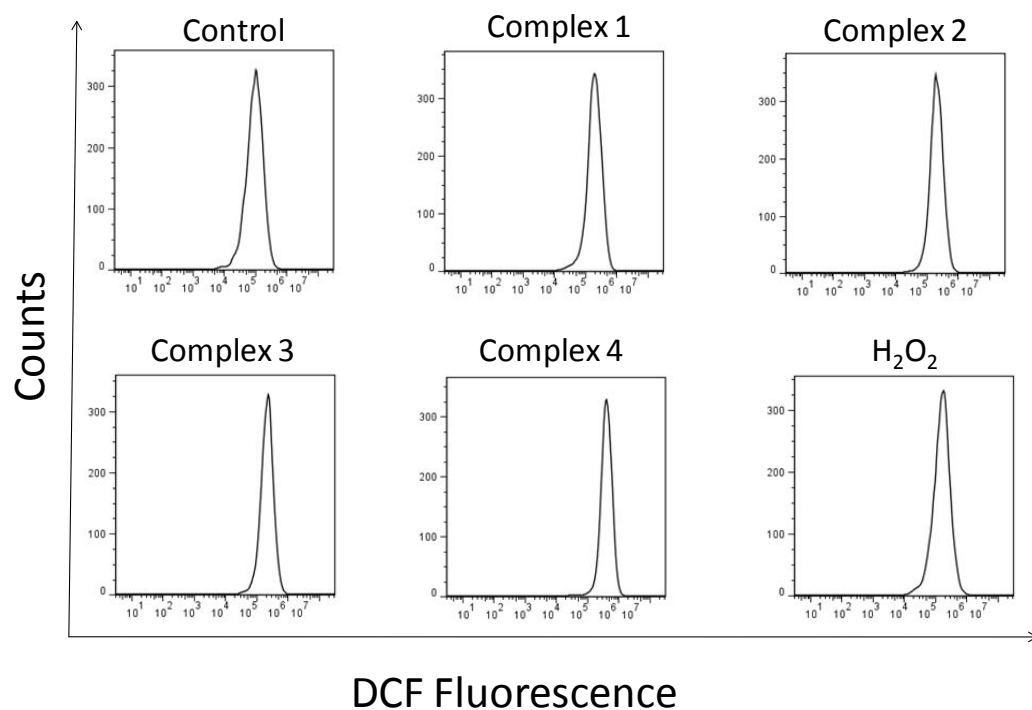


Figure S17. Analysis of ROS levels by flow cytometry after A549 cells were treated with complexes 1-4 (20 μ M) and H_2O_2 (20 μ M) for 6 h and stained with H_2DCFDA .

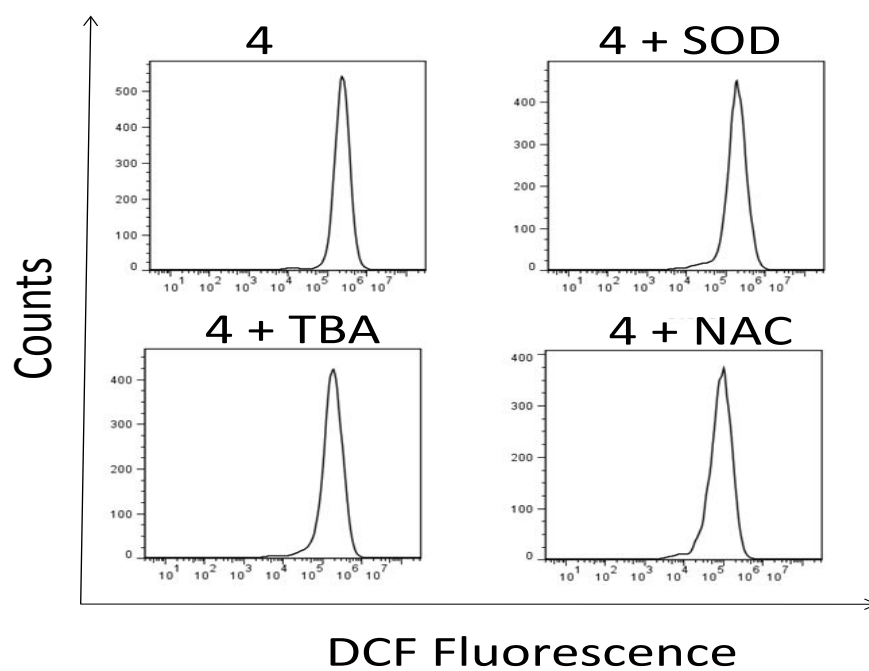


Figure S18. ROS levels induced by complex **4** in the presence of superoxide anion radical scavenger (SOD), hydroxyl radical scavengers (TBA) and nonspecific antioxidant (NAC).

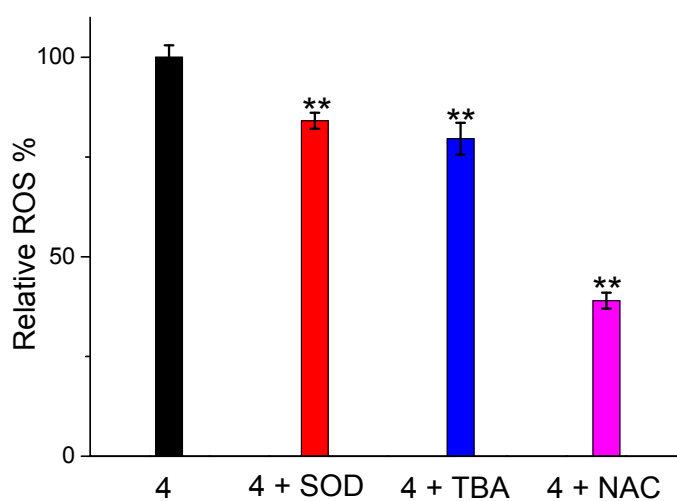


Figure S19. Quantification of the flow cytometric results in Figure S18. Results are the mean $\pm$ SD (n = 3). ** $p < 0.01$ compared with the value of complex **4**.

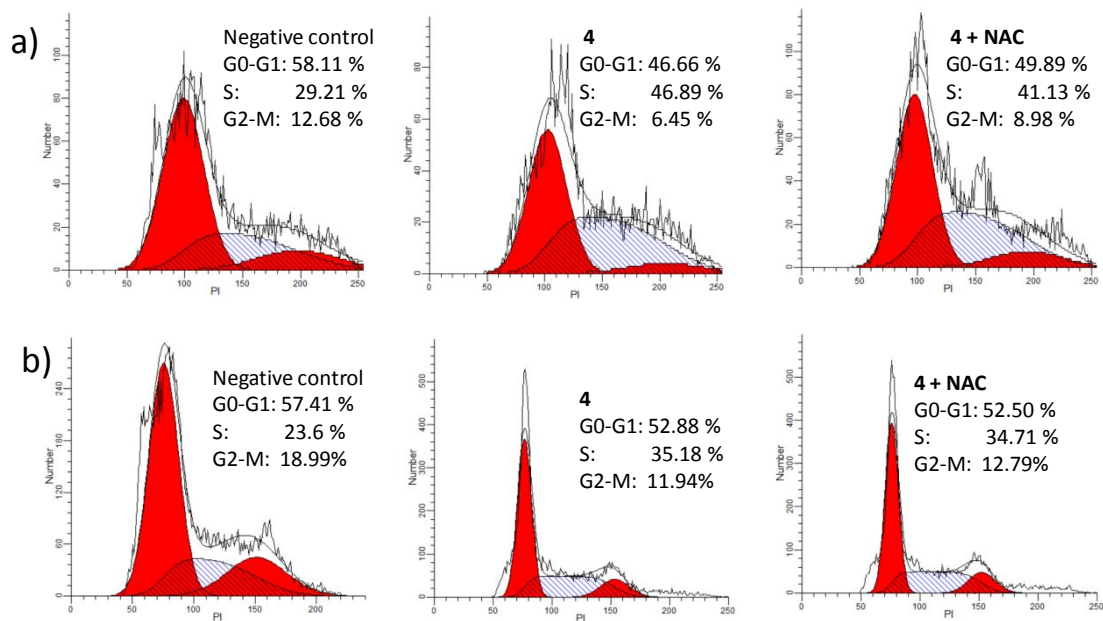


Figure S20. Cell cycle distribution of A549 cells (a) and A549/Cis Cells (b) treated with complex **4** with and without NAC.

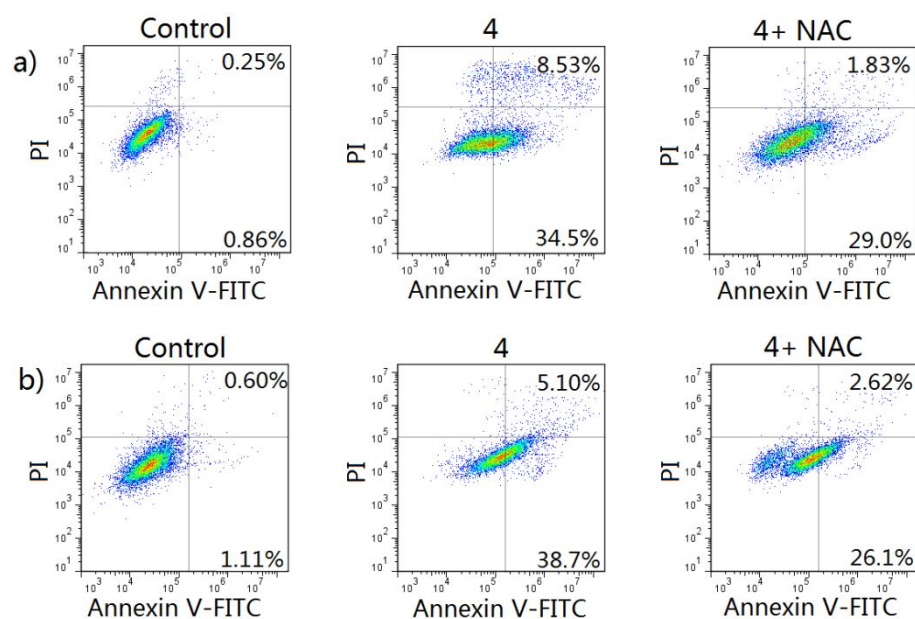


Figure S21. Flow cytometry analysis for apoptosis of A549 cells (a) and A549/Cis Cells (b) treated with complex 4 with and without NAC.

Table S1. Absorption spectroscopic properties of complexes **1-4** on binding to DNA.

Comp	Bathochromic shift ($\Delta\lambda$)	Hypochromicity (%)	K_b (M^{-1})
1	13	42.3	9.72×10^3
2	14	37.3	1.26×10^4
3	10	36.2	9.15×10^3
4	12	47.1	1.15×10^4