Supporting Information

to the manuscript:

A first-in-class and a fished out anticancer platinum compound: *cis*-$[PtCl_2(NH_3)_2]$ and *cis*-$[PtI_2(NH_3)_2]$ compared in their reactivity towards DNA model systems

Domenica Musumeci,[1,2] Chiara Platella,[1] Claudia Riccardi,[1] Antonello Merlino,[1,2] Tiziano Marzo,[3,4] Lara Massai,[3] Luigi Messori,[3] Daniela Montesarchio[1*]

1 *Department of Chemical Sciences, University of Napoli Federico II, Via Cintia, 21, I-80126 Napoli, Italy*

2 *Institute of Biostructures and Bioimages, Via Mezzocannone 16, I-80100 Napoli, Italy*

3 *Department of Chemistry "Ugo Schiff", University of Firenze, Via della Lastruccia, 3-13, I-50019 Sesto Fiorentino, Italy*

4 *Department of Chemistry and Industrial Chemistry, University of Pisa, via Moruzzi, 13, 56124 Pisa, Italy*

*Corresponding Author's E-mail: daniela.montesarchio@unina.it;

Phone: +39 081 674126; Fax: +39 081 674090.

Content:

CD studies

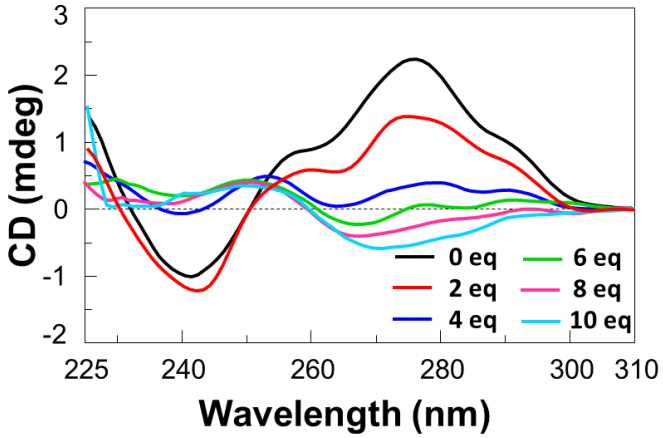


Figure S1. Overlapped CD spectra of ODN **2** at 2 μM concentration in the absence (black line) and presence of increasing amounts of PtI2 (see legend) in a 10 mM phosphate buffer/50 mM NaCl, pH=7.0 solution.

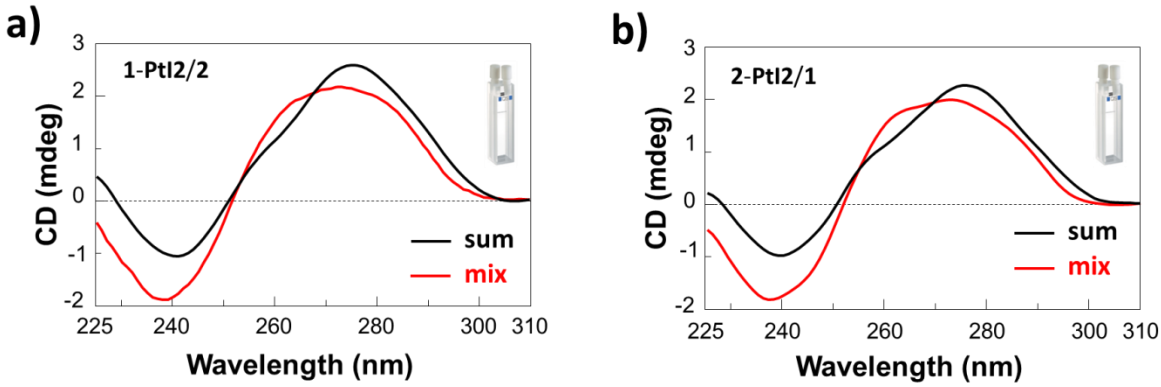


Figure S2. *Sum* (black lines) and *mix* (red lines) CD spectra of **1**-PtI2/**2** (**a**) and **2**-PtI2/**1** (**b**) at 1 μM ODN concentration and 2 eq of the platinum complex (with respect to the duplex) recorded in a *tandem cell* in a 10 mM phosphate buffer/50 mM NaCl, pH=7.0 solution.

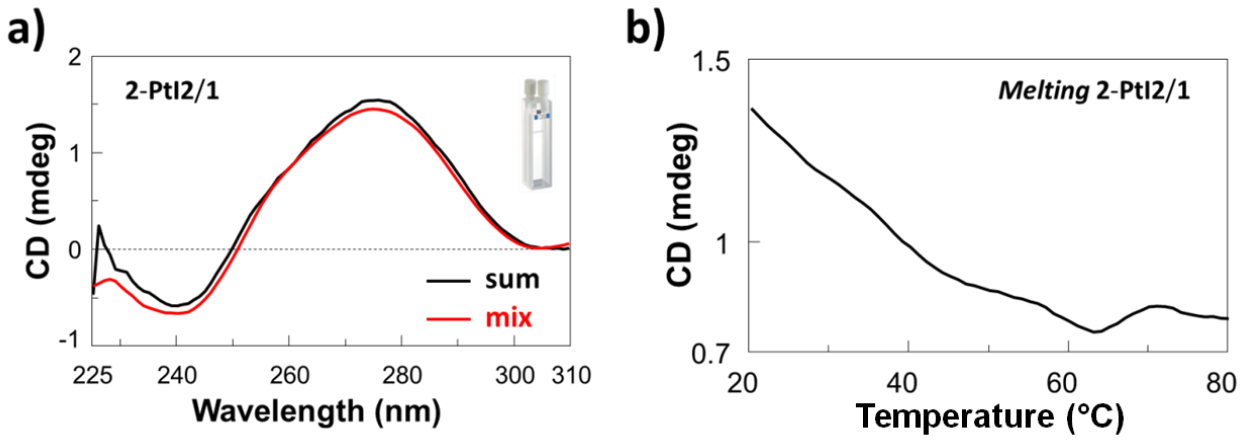


Figure S3. **a**) *Sum* (black line) and *mix* (red line) CD spectra for the system **2**-PtI2/**1** at 1 μM ODN concentration and 10 eq of the platinum complex (with respect to the expected duplex) recorded in a *tandem cell* in a 10 mM phosphate buffer/50 mM NaCl, pH=7.0 solution; **b**) CD-melting curve recorded at λ = 270 nm for the system **2**-PtI2/**1** after mixing the two components and CD signal stabilization.

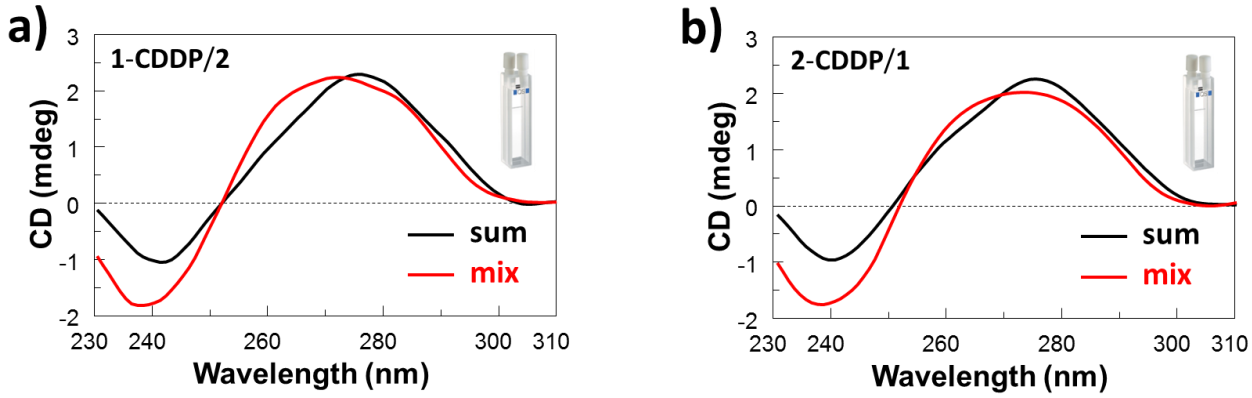
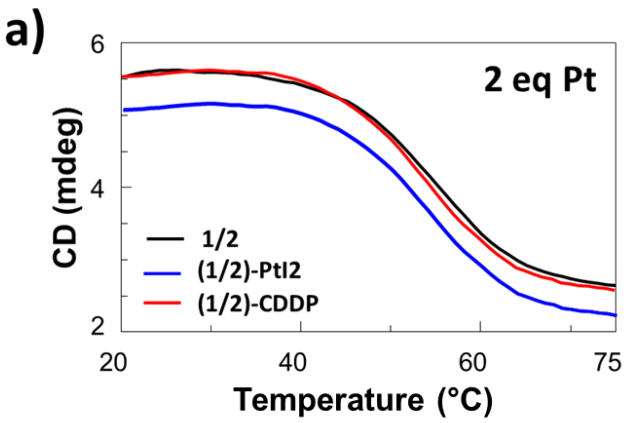


Figure S4. *Sum* (black lines) and *mix* (red lines) CD spectra of **1**-CDDP/**2** (**a**) and **2**-CDDP/**1** (**b**) at 1 μM ODN concentration and 10 eq of the platinum complex (with respect to the duplex) recorded in a *tandem cell* in a 10 mM phosphate buffer/50 mM NaCl, pH=7.0 solution.



b)

	$\Delta CD_{(20\text{-}75\ °C)}$ (mdeg)	T_m (°C) ± 1
Untreated duplex **1/2**	2.84	55
(1/2)-PtI2	2.83	54
(1/2)-CDDP	2.85	55

Figure S5. **a**) Overlapped CD-melting curves of the untreated duplex **1**/**2** (black line) and of the duplex (2 μM) incubated with 2 eq of PtI2 (blue) and CDDP (red) (with respect to the duplex) in 10 mM phosphate buffer/50 mM NaCl, recorded at 270 nm with a temperature increase of 1 °C/min; **b**) table of the resulting data.

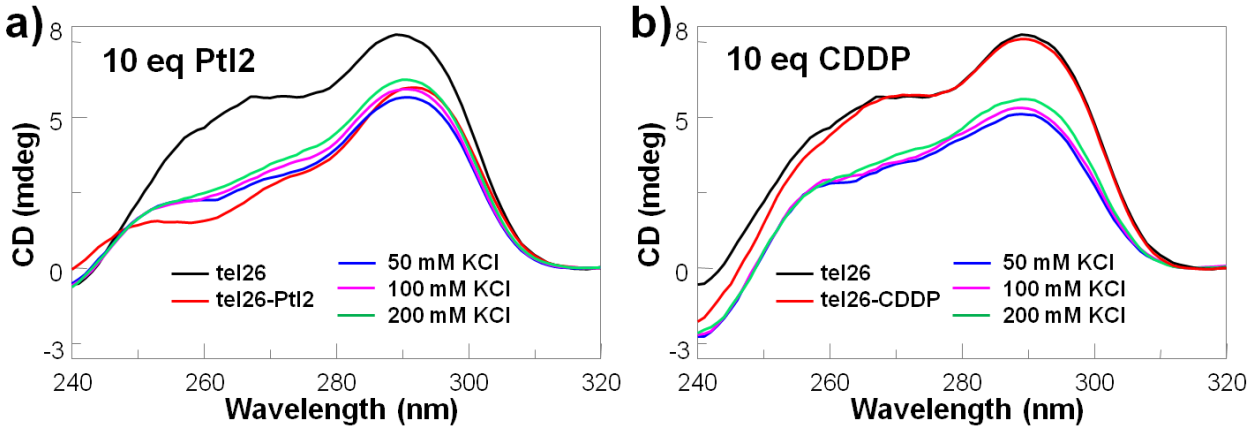


Figure S6. Overlapped CD spectra of: (*i*) the **tel$_{26}$** G4 structure, formed after annealing in the here used pseudo-physiological buffer (black lines); (*ii*) the structure formed after 48 h incubation of the preformed **tel$_{26}$** G-quadruplex with 10 eq of PtI2 (panel **a**) or CDDP (panel **b**) (red lines); (*iii*) the structures formed after 72 h incubation of **tel$_{26}$** in "non-G4" form (*i.e.*, dissolved in 20 mM Tris-HCl pH=7.2) with 10 eq of each platinum complex and then treated with increasing KCl amounts (see legend).

UV-vis studies

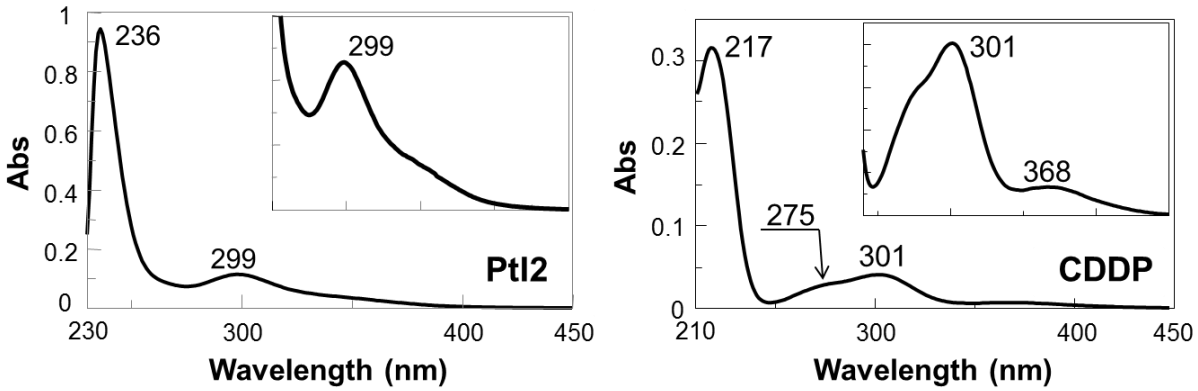


Figure S7: UV spectra of PtI2 and CDDP dissolved at 100 and 500 µM concentration, respectively, in a 10 mM phosphate buffer/50 mM NaCl, pH=7.0 solution; a magnification of the spectral region 250-450 nm is reported in the inset.

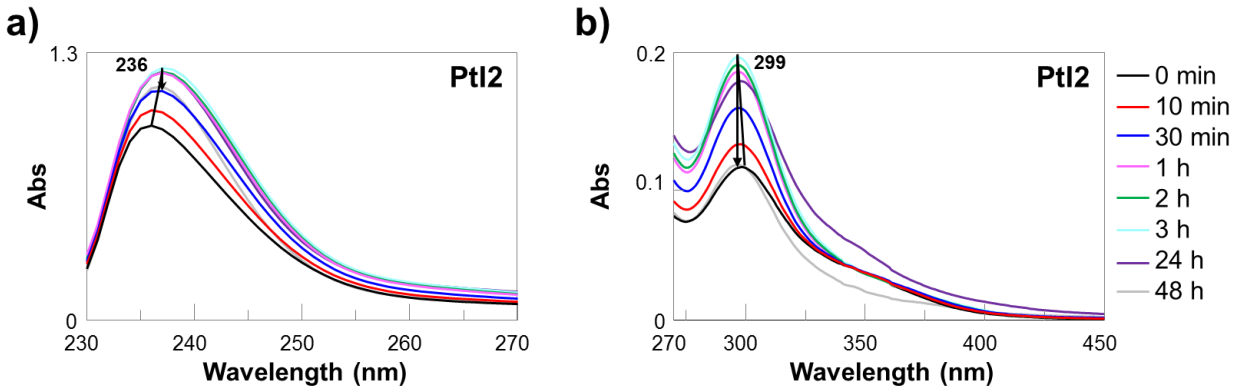


Figure S8: UV-monitored hydrolysis of PtI2 at 100 µM concentration in pseudo-physiological conditions: the arrows indicate the evolution of the bands at 236 (panel **a**) and 299 nm (panel **b**). For sake of clarity, the two systems are represented in graph using different Y-scales.

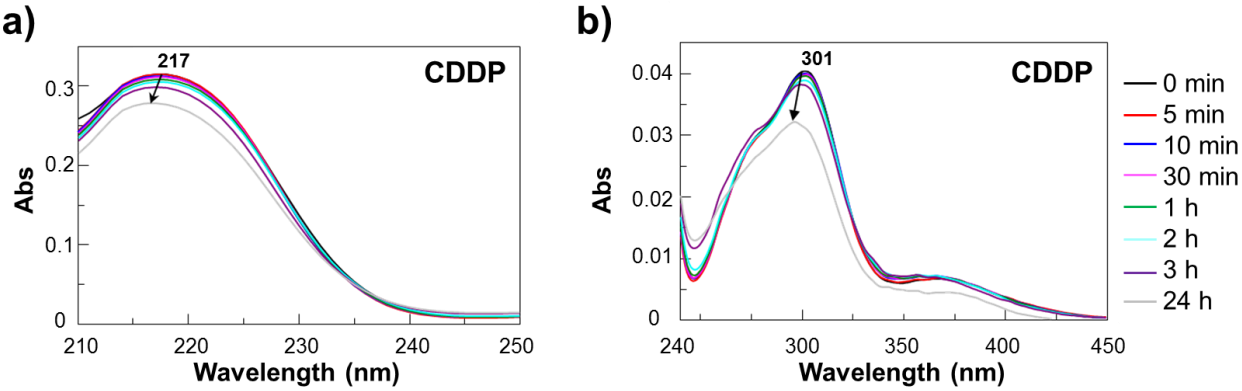


Figure S9: UV-monitored hydrolysis of CDDP at 500 µM concentration in pseudo-physiological conditions: the arrows indicate the evolution of the bands at 217 (panel **a**) and 301 nm (panel **b**). For sake of clarity, the two systems are represented in graph using different Y-scales.

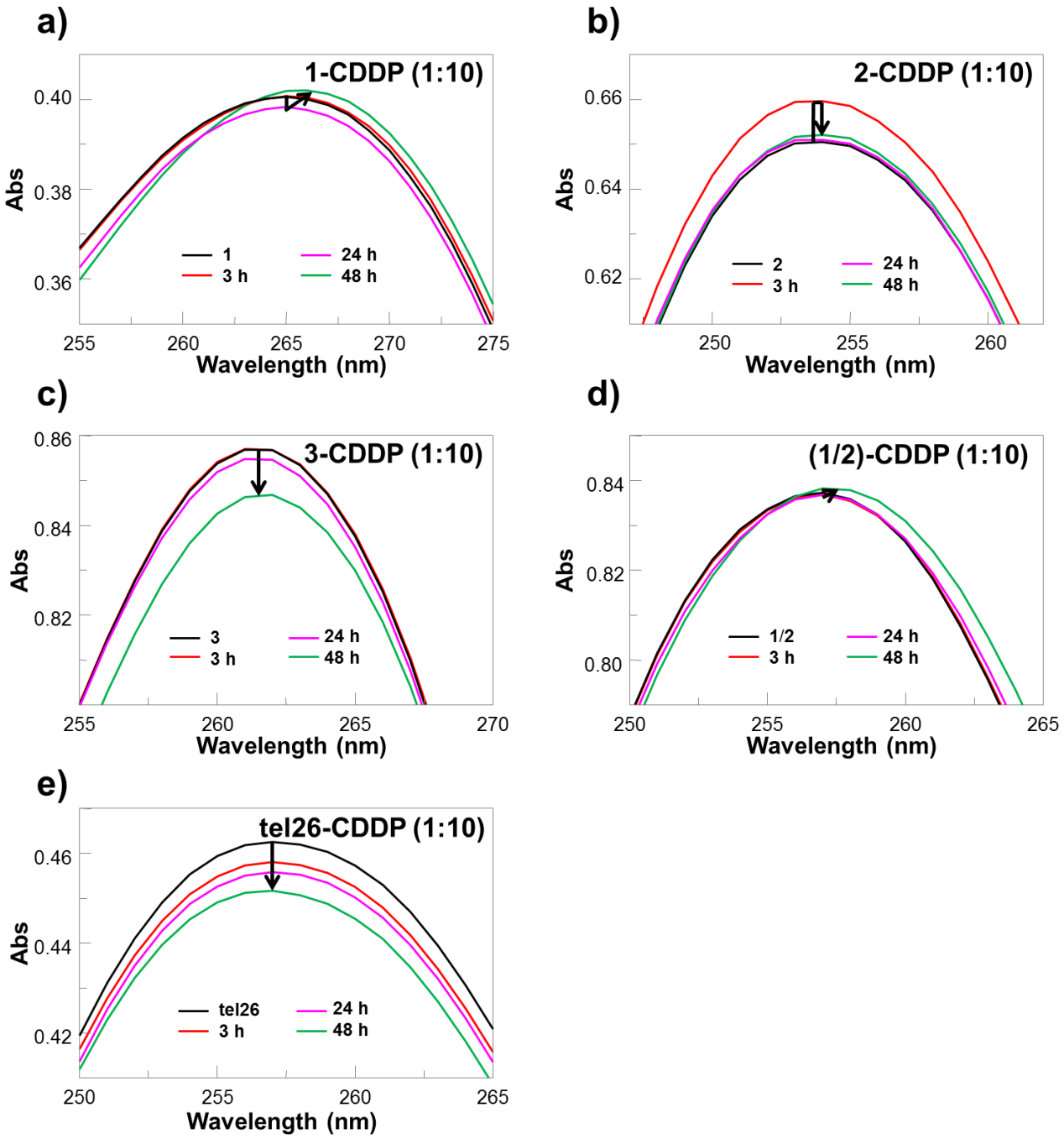


Figure S10. UV spectra of ODN **1** (panel **a**), ODN **2** (panel **b**), ODN **3** (panel **c**), duplex **1**/**2** (panel **d**) at 4 μM concentration and **tel**$_{26}$ G4 (panel **e**) at 2 μM concentration in pseudo-physiological conditions, in the absence (black lines) and presence of 10 eq of CDDP, recorded at different incubation times (see legends). For sake of clarity, only the magnifications of the ODNs bands are reported, using the same Y-axis scale.

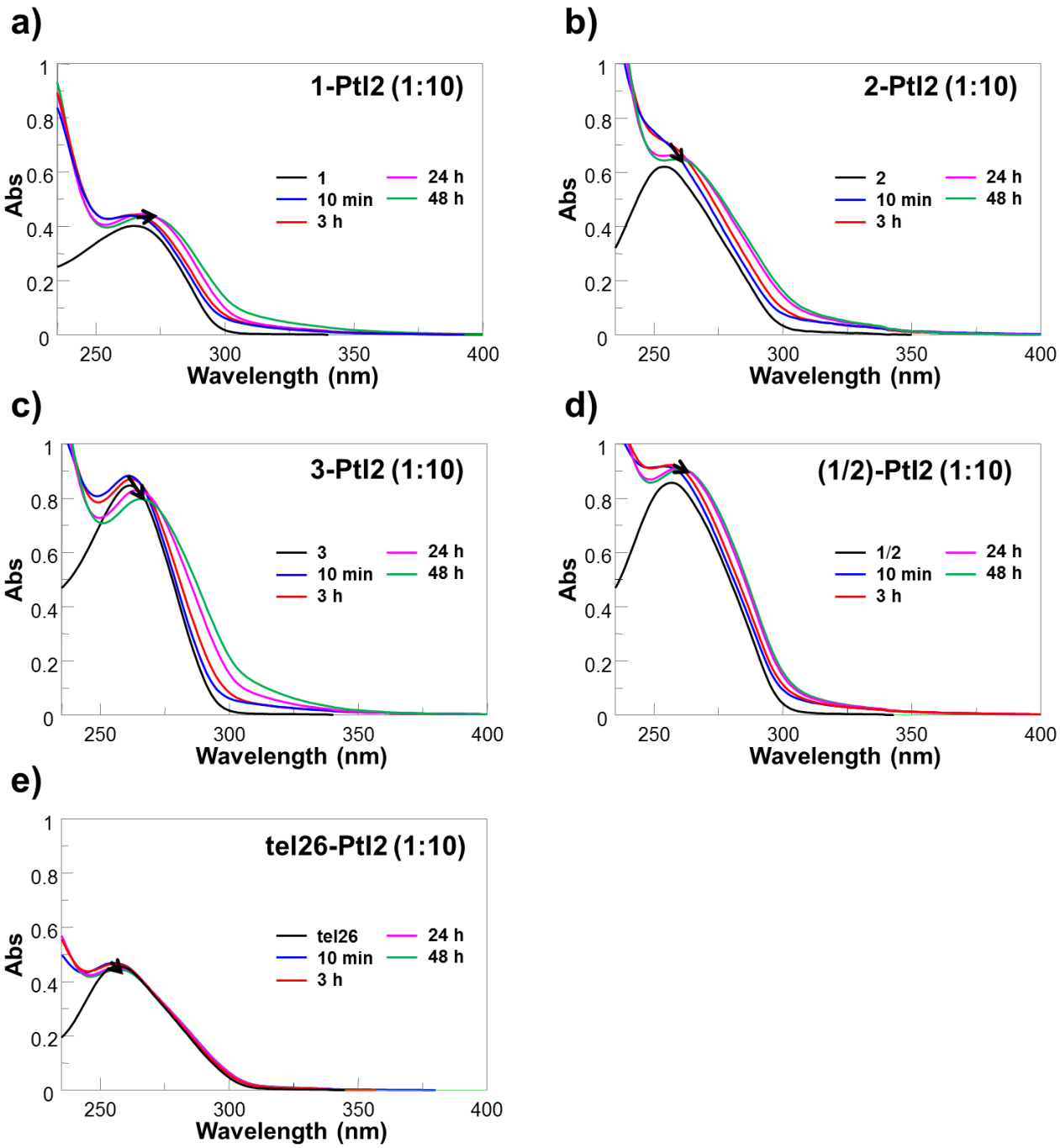


Figure S11. UV spectra of ODN **1** (panel **a**), ODN **2** (panel **b**), ODN **3** (panel **c**), duplex **1**/**2** (panel **d**) at 4 μM concentration and **tel**$_{26}$ G4 (panel **e**) at 2 μM concentration in pseudo-physiological conditions, in the absence (black lines) and presence of 10 eq of PtI2, recorded at different incubation times (see legends).

ESI-MS studies

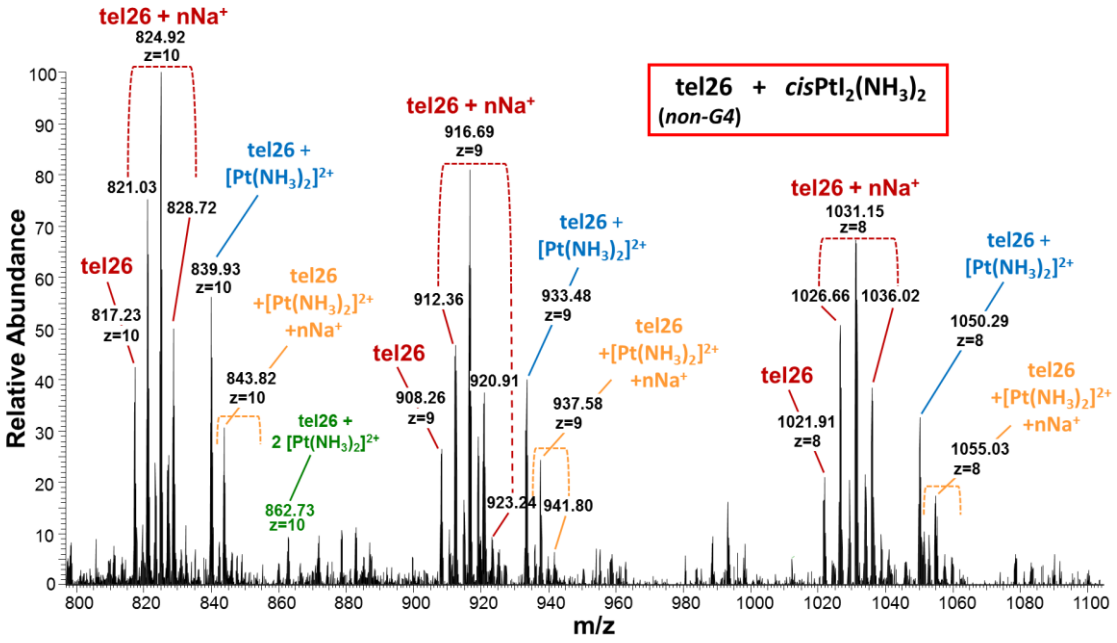


Figure S12. ESI-MS spectrum of **tel$_{26}$** (in "non-G4" conformation) incubated in water at 37 °C for 48 h at 10 µM concentration with 3 eq of PtI2. The injection has been carried out at the final concentration of 5 µM ODN in CH_3OH/H_2O, 1:1 (v/v).

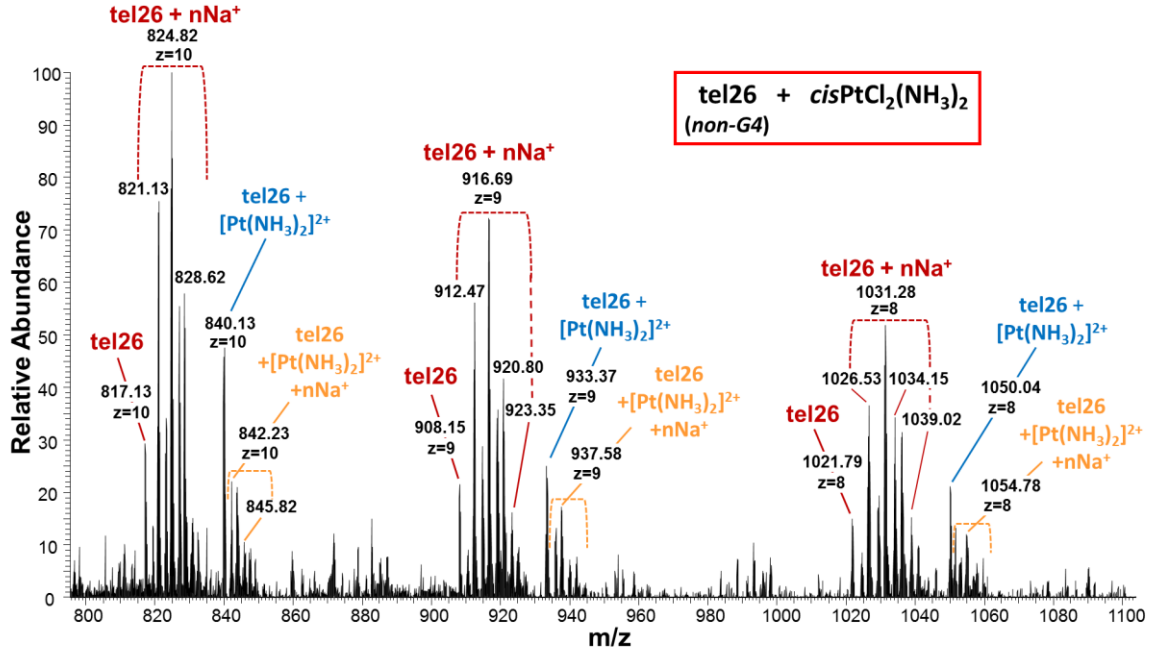


Figure S13. ESI-MS spectrum of **tel$_{26}$** (in "non-G4" conformation) incubated in water at 37 °C for 48 h at 10 µM concentration with 3 eq of CDDP. The injection has been carried out at the final concentration of 5 µM ODN in CH_3OH/H_2O, 1:1 (v/v).

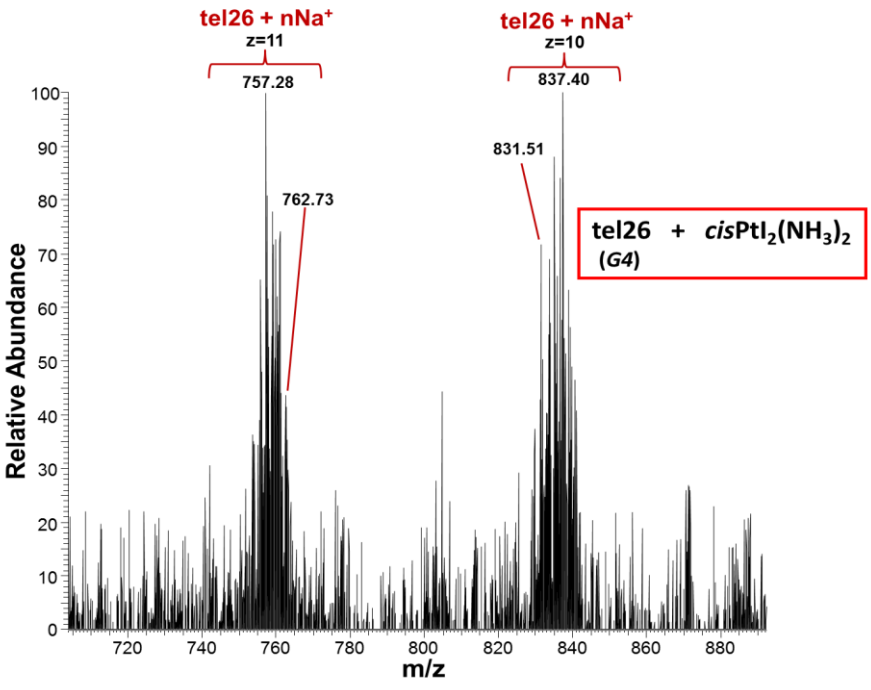


Figure S14. ESI-MS spectrum of **tel$_{26}$** structured in G4 conformation (10 µM) after 48 h incubation with 3 eq of PtI2. The injection has been carried out at the final concentration of 5 µM ODN in CH_3OH/H_2O, 1:1 (v/v).

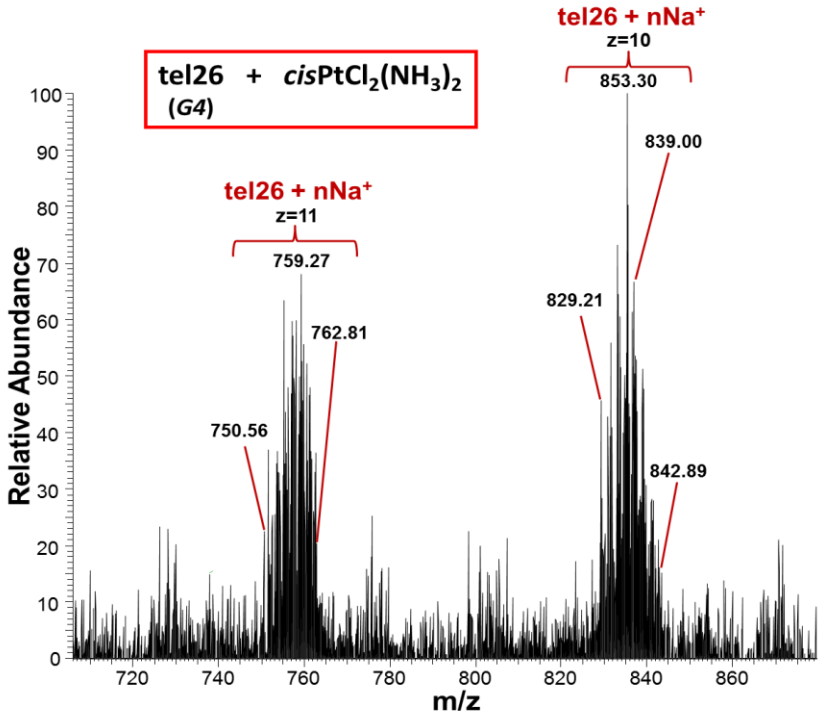


Figure S15. ESI-MS spectrum of **tel$_{26}$** structured in G4 conformation (10 µM) after 48 h incubation with 3 eq of CDDP. The injection has been carried out at the final concentration of 5 µM ODN in CH_3OH/H_2O, 1:1 (v/v).