Supplementary Material

Two novel SNS-donor palladium(II) complexes of benzoxazole and benzothiazole derivatives as potential anticancer agents

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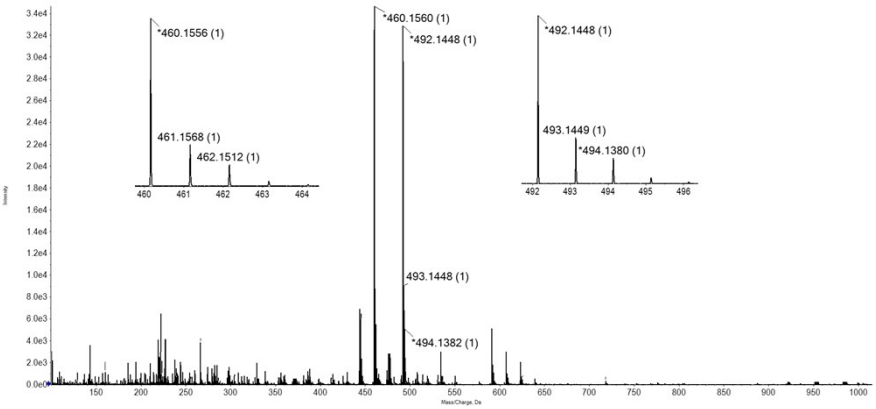

Fig. S1 High resolution electrospray ionization-mass spectrum (HRMS, ESI) of $\mathbf{L_2}$ in methanol solution. The signals at *m*/*z* 460.1560 and 492.1448 should be assigned to $[\mathbf{L_2} + H]^+$ and $[\mathbf{L_2} + H + CH_3OH]^+$, respectively.

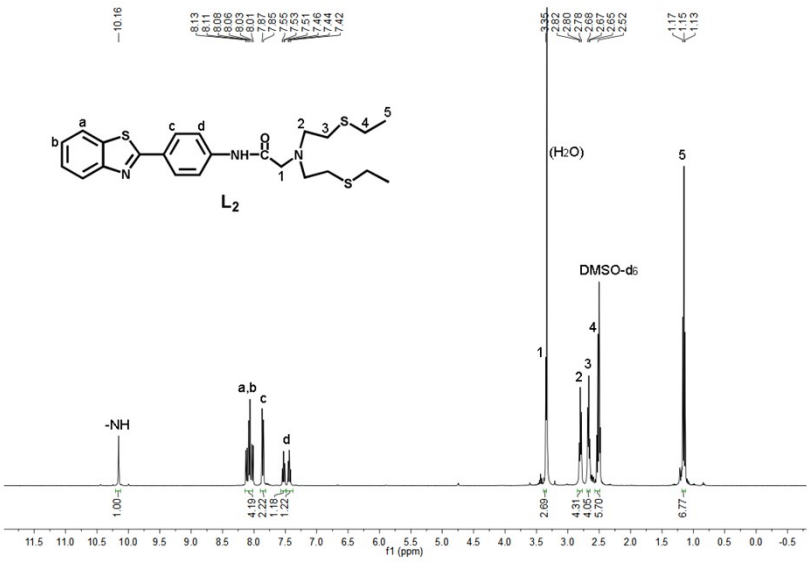

Fig. S2 ^{1}H NMR of *N*-(4-(benzo[*d*]thiazol)-2-yl)phenyl)-2-(bis(2-ethylthioethyl)amino)acetamide (**L_2**) in DMSO-d_6.

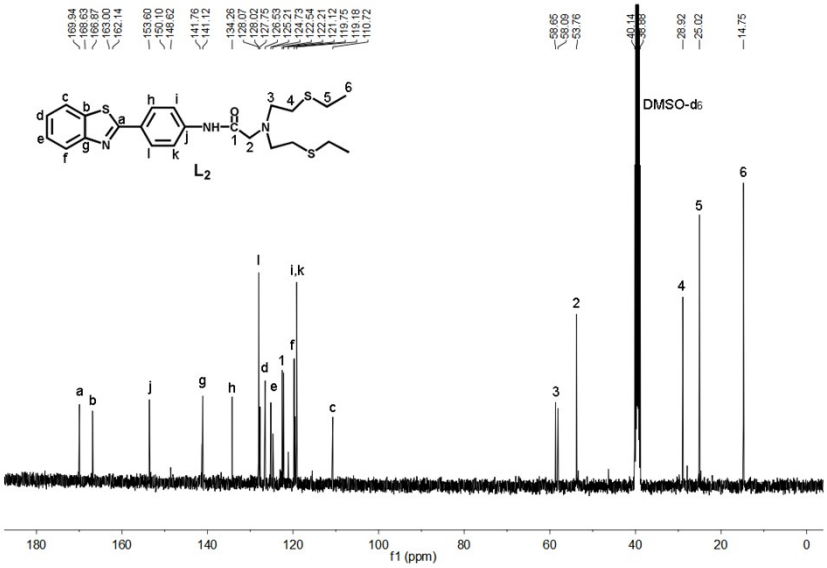

Fig. S3 ^{13}C NMR of *N*-(4-(benzo[*d*]thiazol)-2-yl)phenyl)-2-(bis(2-ethylthioethyl)amino)acetamide (**L_2**) in DMSO-d_6.

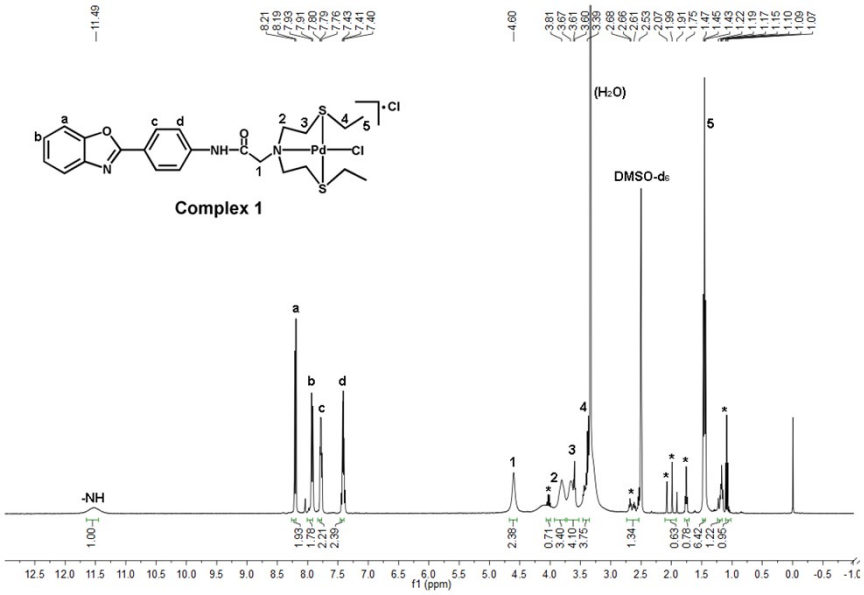

Fig. S4 ^{1}H NMR of complex **1** ([Pd**L_1**Cl]Cl) in DMSO-d_6. The signals marked with * are for the protons from residual solvents ethyl acetate, acetone, and diethyl ether.

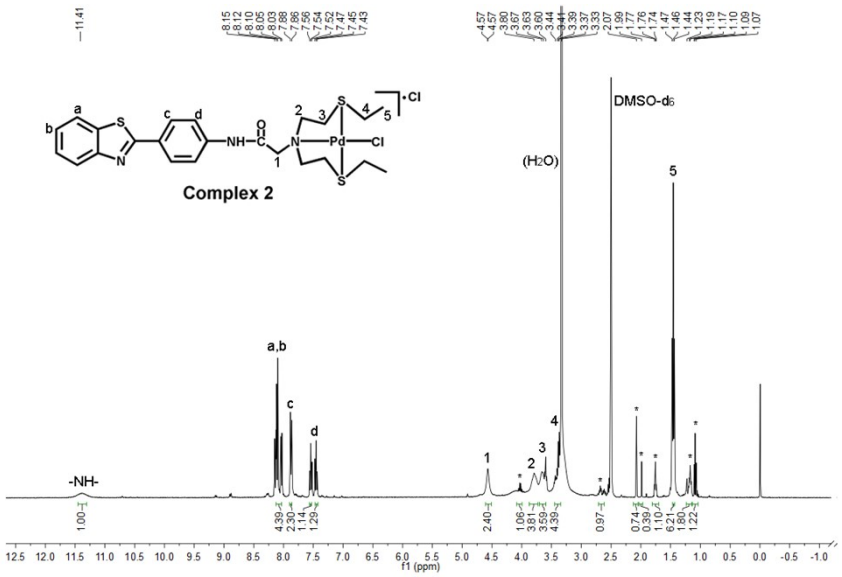

Fig. S5 ^{1}H NMR of complex **2** ([Pd$\mathbf{L_2}$Cl]Cl) in DMSO-d_6. The signals marked with * are for the protons from residual solvents ethyl acetate, acetone, and diethyl ether.

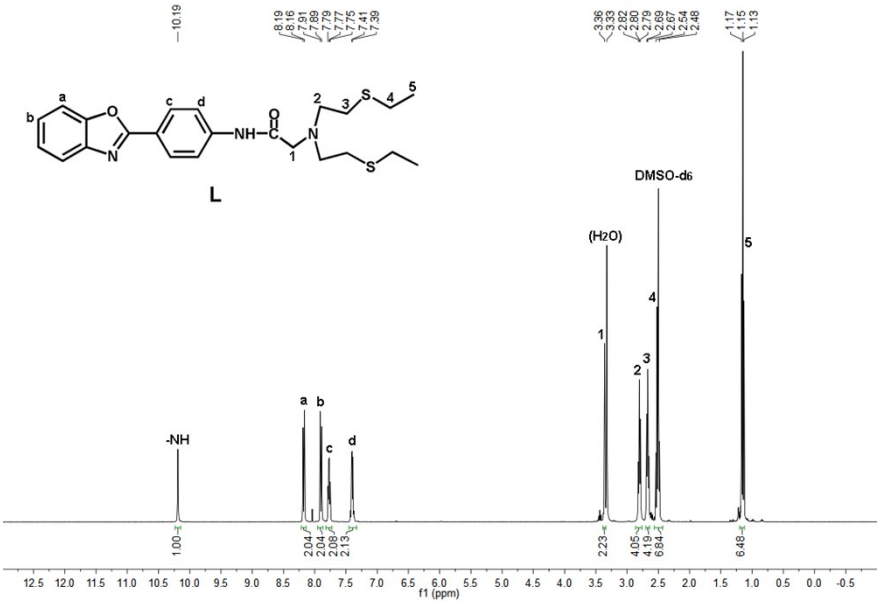

Fig. S6 ^{1}H NMR of ligand $\mathbf{L_1}$ in DMSO-d_6.

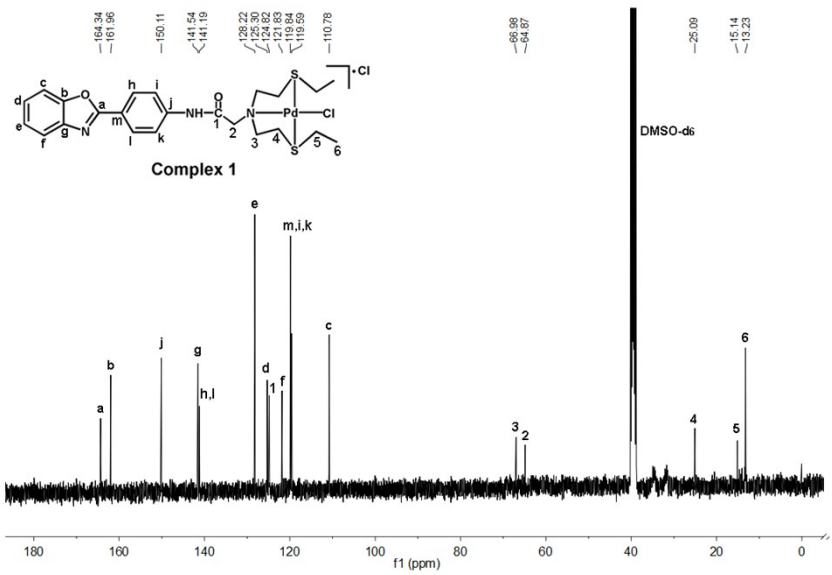

Fig. S7 ^{13}C NMR of complex **1** ([Pd$\mathbf{L_1}$Cl]Cl) in DMSO-d_6.

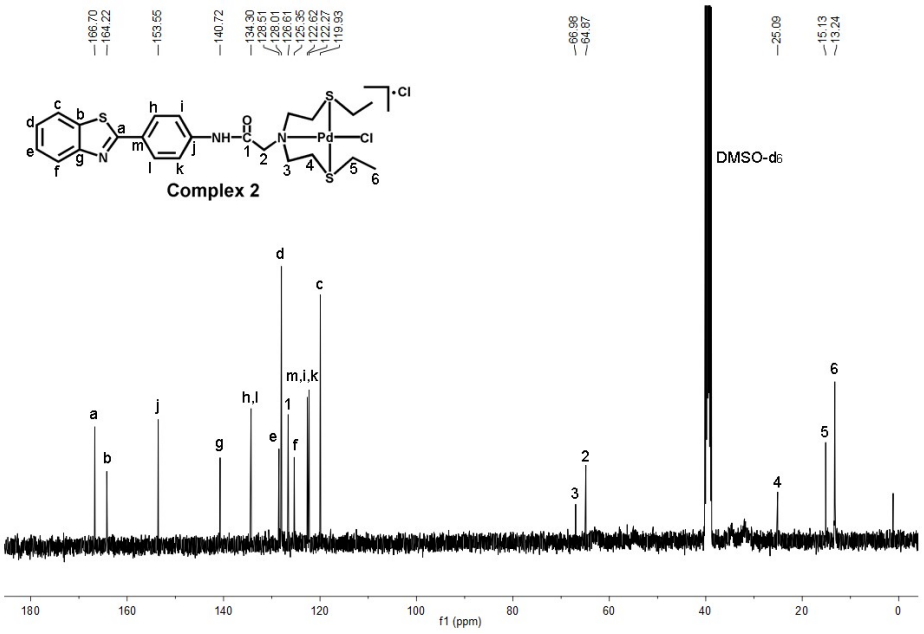

Fig. S8 ^{13}C NMR of complex **2** ([Pd$\mathbf{L_2}$Cl]Cl) in DMSO-d_6.

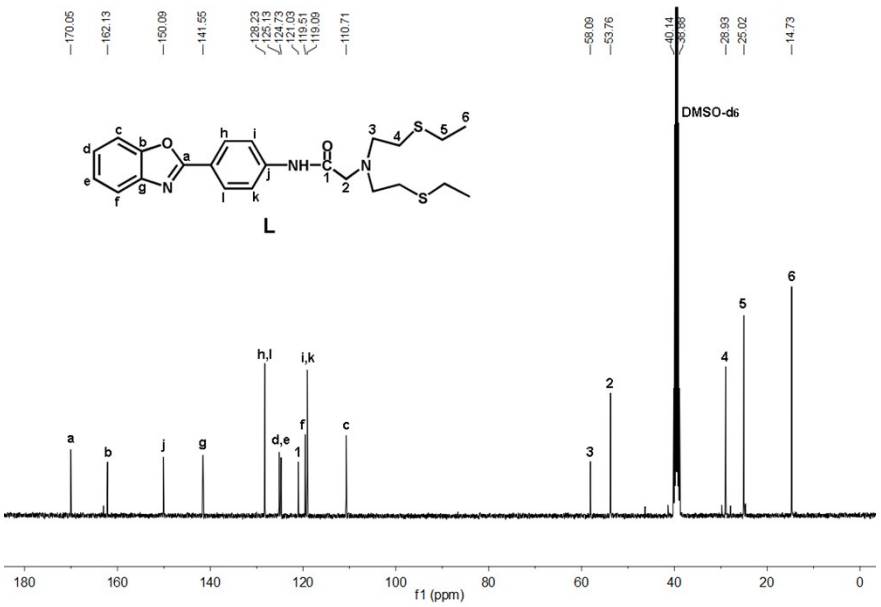

Fig. S9 ^{13}C NMR of ligand $\mathbf{L_1}$ in DMSO-d_6.

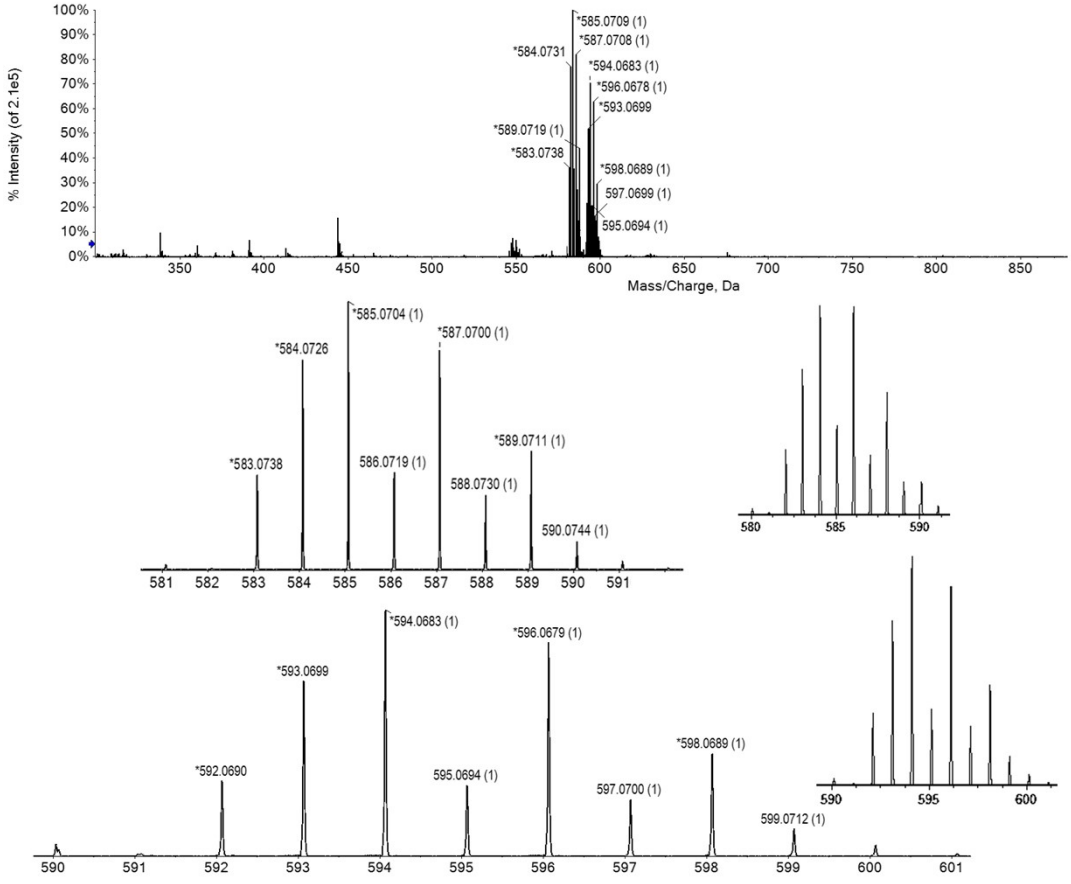

Fig. S10 High resolution electrospray ionization-mass spectrum (HRMS, ESI) of **1** in methanol solution. The signals at *m*/*z* 585.0709 and 594.0683 should be assigned to $[M - Cl]^+$ and $[M - 2Cl + CH_3CHO]^+$, respectively (M = [Pd$\mathbf{L_1}$Cl]Cl).

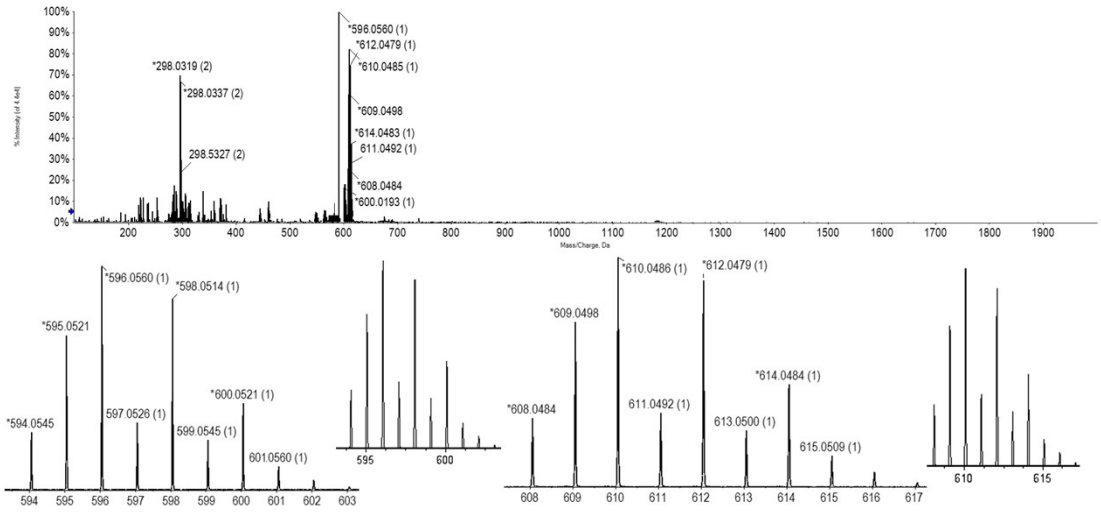

Fig. S11 High resolution electrospray ionization-mass spectrum (HRMS, ESI) of complex **2** in methanol solution. The signals at *m*/*z* 298.0319, 596.0560, and 610.0485 should be assigned to $[M - 2Cl + CH_3OH]^{2+}$, $[M - 2Cl + CH_3O]^{+}$, and $[M - 2Cl + CH_3CH_2O]^{+}$, respectively (M = [Pd$\mathbf{L_2}$Cl]Cl).

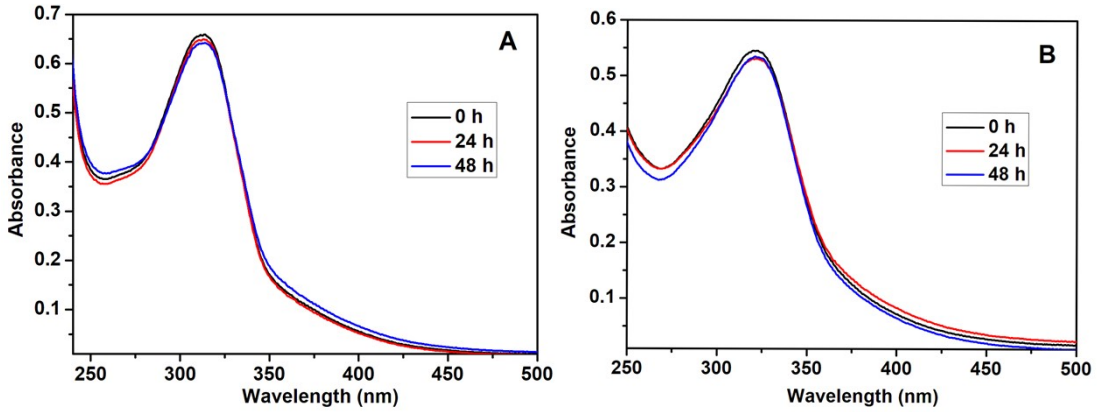

Fig. S12 Time-dependent UV-vis absorption spectra of complex **1** (A) or **2** (B) (25 μM) in cell culture media (Dulbecco's modified Eagle's medium (DMEM)) with 0.3% DMSO at 37 °C.

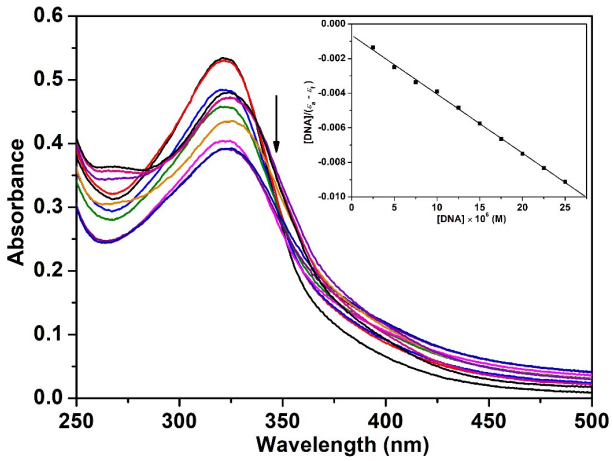

Fig. S13 Absorption spectra of complex **2** ([complex] = 25 μM) in the absence and presence of an increasing amount of CT-DNA (2.5, 5.0, 7.5, 10.0, 12.5, 15.0, 17.5, 20.0, 22.5, and 25.0 μM) at 37 °C after 24 h of incubation in Tris-HCl/NaCl buffer (pH 7.4). The inset shows the plot of [DNA]/($\varepsilon_a - \varepsilon_f$) *vs*. [DNA].

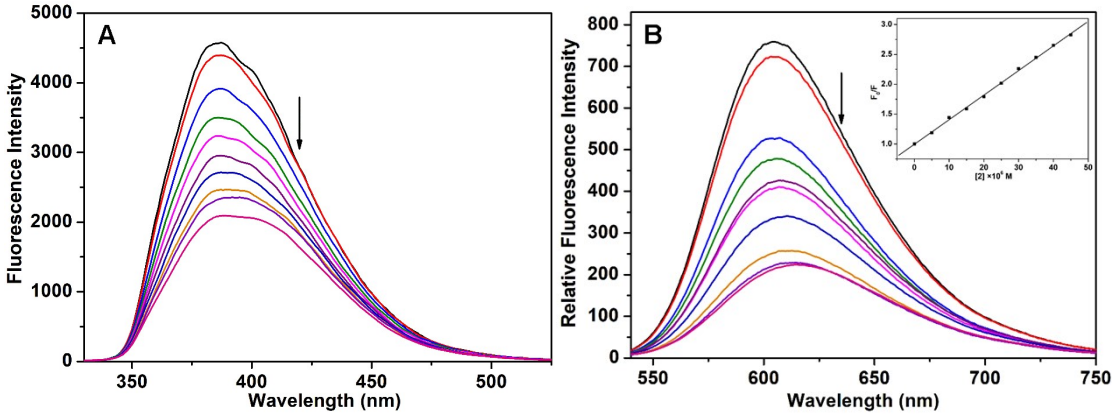

Fig. S14 (A) Fluorescence emission spectra of complex **2** (10 μM, λ_{ex} = 316 nm) in the absence (black line) and presence (color lines) of CT-DNA (r = [DNA]/[**2**] = 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9) at 37 °C after 24 h of incubation. (B) Fluorescence emission spectra (λ_{ex} = 526 nm) of the CT-DNA-EB system ([DNA] = [EB] = 5.68 × 10^{-6} M) in the absence and the presence of complex **1** (5, 10, 15, 20, 25, 30, 35, 40, 45 μM). Insets: Stern-Volmer plot of the EB-DNA fluorescence titration for **2**.

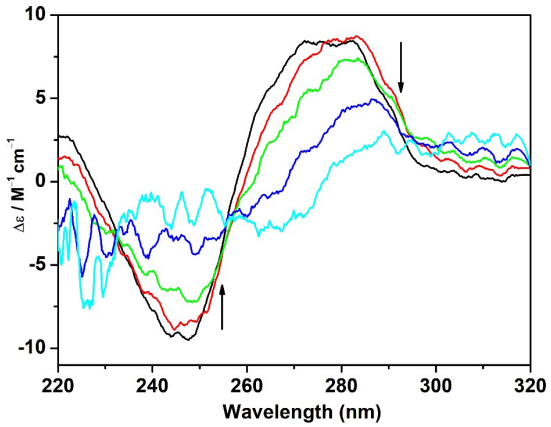

Fig. S15 CD spectra of CT-DNA (1.0×10^{-4} M) in the absence (the black sold line) and presence of complex **2** (the color sold lines, [complex]/[DNA] = 0.2, 0.4, 0.6, 0.8) at 37 °C in pH 7.40 after 24 h of incubation time.

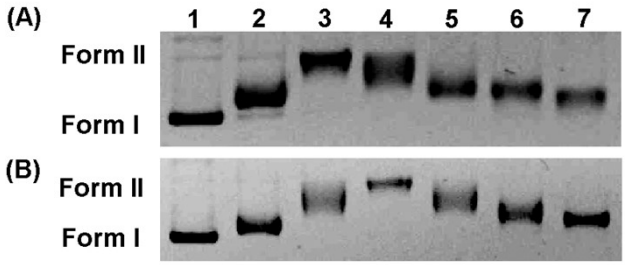

Fig. S16 Agarose gel electrophoresis patterns of supercoiled pUC19 plasmid DNA incubated with **1** (A) or **2** (B) at 37 °C for 24 h. Lane 1, control; lanes 2–7, the r_i values of 0.015, 0.03, 0.045, 0.06, 0.12, 0.18, respectively.

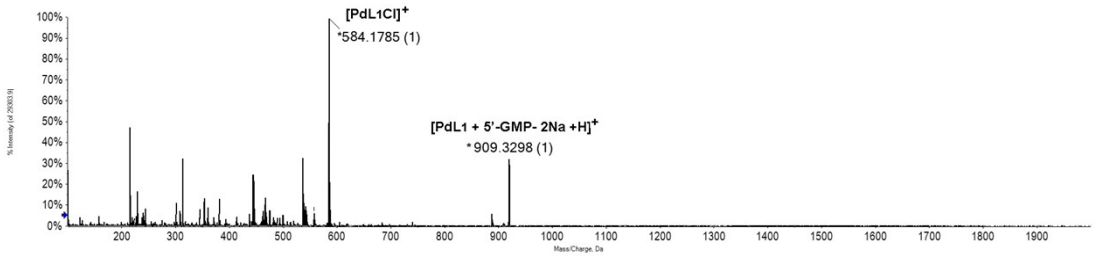

Fig. S17 High resolution electrospray ionization-mass spectrum (HRMS, ESI) of the reaction between complex **1** and 5′-GMP (1:1) recorded in methanol/water (v/v, 1:1) at 37 °C for 24 h. Assignments: 909.3298, $[Pd\mathbf{L_1}(GMP)–2Na+H]^+$ ($C_{33}H_{42}N_8S_2O_{10}PPd$, calcd. 911.12); 584.1785, $[Pd\mathbf{L_1}Cl]^+$ ($C_{23}H_{29}N_3S_2O_2ClPd$, calcd. 584.04).

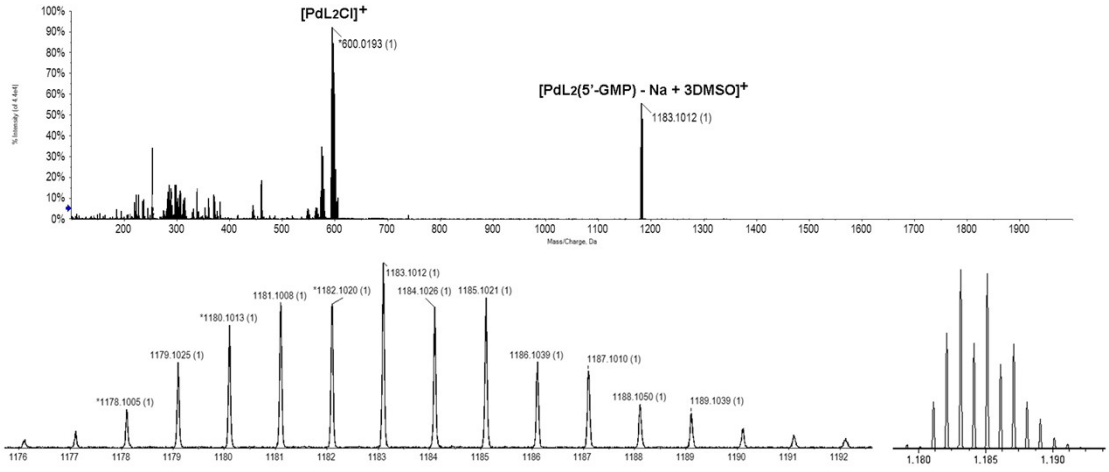

Fig. S18 High resolution electrospray ionization-mass spectrum (HRMS, ESI) of the reaction between complex **2** and 5′-GMP (1:1) recorded in methanol/water (v/v, 1:1) at 37 °C for 24 h. Assignments: 1183.1012, $[Pd\mathbf{L_2}(GMP)– Na+3DMSO]^+$ ($C_{39}H_{59}N_8S_6O_{12}PNaPd$, calcd. 1183.12); 600.0193, $[Pd\mathbf{L_2}Cl]^+$ ($C_{23}H_{29}N_3S_3OClPd$, calcd. 600.02).

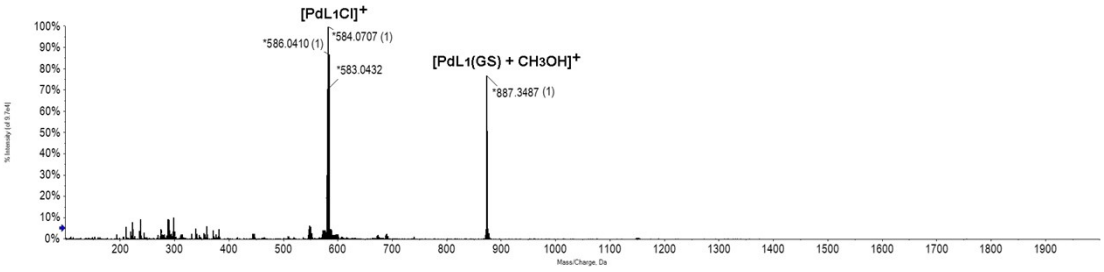

Fig. S19 High resolution electrospray ionization-mass spectrum (HRMS, ESI) of the reaction between complex **1** and GSH (1:1) recorded in methanol/water (v/v, 1:1) at 37 °C for 24 h. Assignments: 887.3487, [Pd**L**$_1$(GS) +CH_3OH]$^+$ ($C_{34}H_{49}N_6S_3O_9Pd$, calcd. 887.17); 584.0707, [Pd**L**$_1$Cl]$^+$ ($C_{23}H_{29}N_3S_2O_2ClPd$, calcd. 584.04).

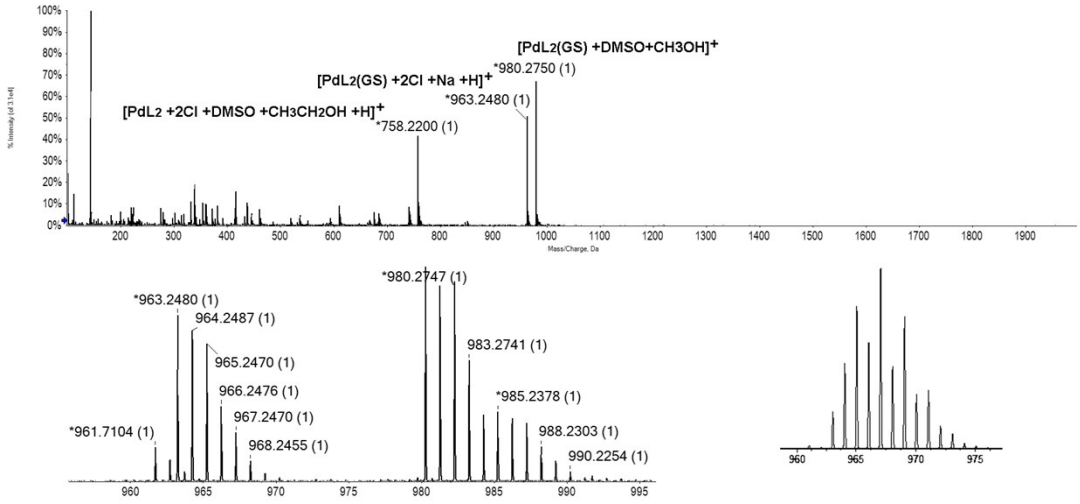

Fig. S20 High resolution electrospray ionization-mass spectrum (HRMS, ESI) of the reaction between complex **2** and GSH (1:1) recorded in methanol/water (v/v, 1:1) at 37 °C for 24 h. Assignments: 980.2750, [Pd**L**$_2$(GS)+DMSO+CH_3OH]$^+$ ($C_{36}H_{55}N_6S_5O_9Pd$, calcd. 981.17); 963.2480, [Pd**L**$_2$(GS) + 2Cl + Na + H]$^+$ ($C_{33}H_{45}N_6S_4O_7NaCl_2Pd$, calcd. 964.06); 758.2200, [Pd**L**$_2$ + 2Cl + DMSO + CH_3CH_2OH + H]$^+$ ($C_{27}H_{42}N_3S_4O_3Cl_2Pd$, calcd. 760.02).

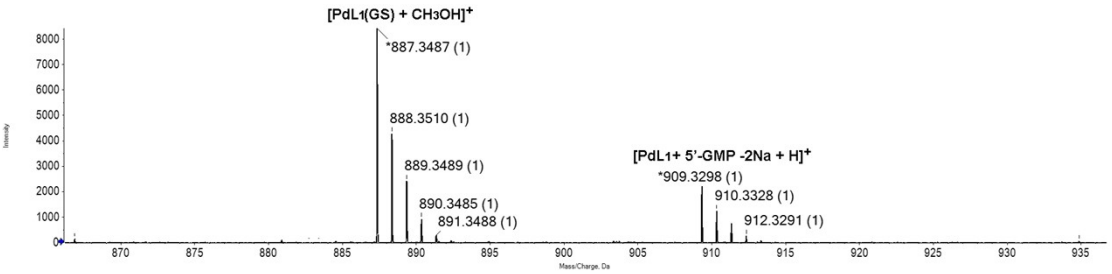

Fig. S21 High resolution electrospray ionization-mass spectrum (HRMS, ESI) of the competitive reaction between complex **1** with 5′-GMP and GSH (1:1:1) recorded in methanol/water/water (v/v/v, 1:1:1) at 37 °C for 24 h. Assignments: 909.3298, [Pd**L**$_{\mathbf{1}}$(GMP)–2Na+H]$^+$ ($C_{33}H_{42}N_8S_2O_{10}PPd$, calcd. 911.12); 887.3487, [Pd**L**$_{\mathbf{1}}$(GS) +CH_3OH]$^+$ ($C_{34}H_{49}N_6S_3O_9Pd$, calcd. 887.17).

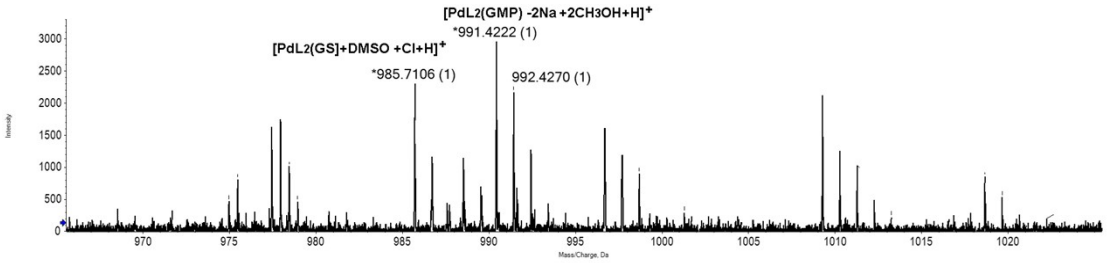

Fig. S22 High resolution electrospray ionization-mass spectrum (HRMS, ESI) of the competitive reaction between complex **2** with 5′-GMP and GSH (1:1:1) recorded in methanol/water/water (v/v/v, 1:1:1) at 37 °C for 24 h. Assignments: 991.4222, [Pd**L**$_{\mathbf{2}}$(GMP)–2Na+2CH_3OH+H]$^+$ ($C_{35}H_{50}N_8S_2O_{11}PPd$, calcd. 991.15); 985.7106, [Pd**L**$_{\mathbf{2}}$(GS) +DMSO +Cl+H]$^+$ ($C_{35}H_{52}N_6S_5O_8ClPd$, calcd. 985.12).