

## Electronic Supplementary Information

for

### Are the metal identity and stoichiometry of metal complexes important for colchicine site binding and inhibition of tubulin polymerization?

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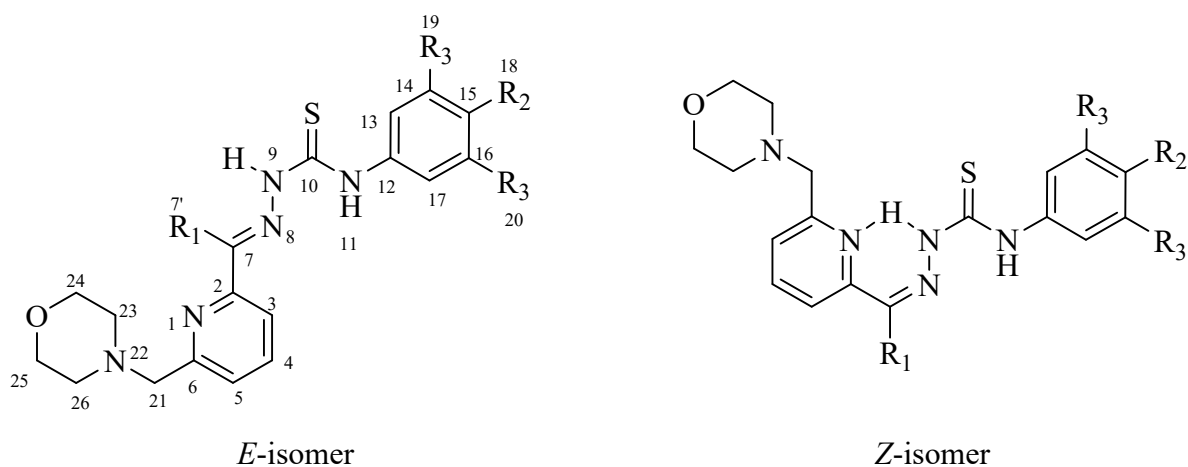
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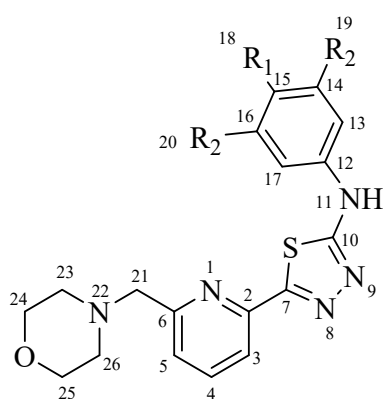
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## 1. NMR Data



**Chart S1.** Atom numbering of ligands for the assignment of NMR resonances.



R<sub>1</sub> = OH, R<sub>2</sub> = Me (**HL<sup>1'</sup>**)

R<sub>1</sub> = H, R<sub>2</sub> = H (**HL<sup>3'</sup>**)

**Chart S2.** Line drawings of oxidized TSCs and their atom numbering for the assignment of NMR resonances.

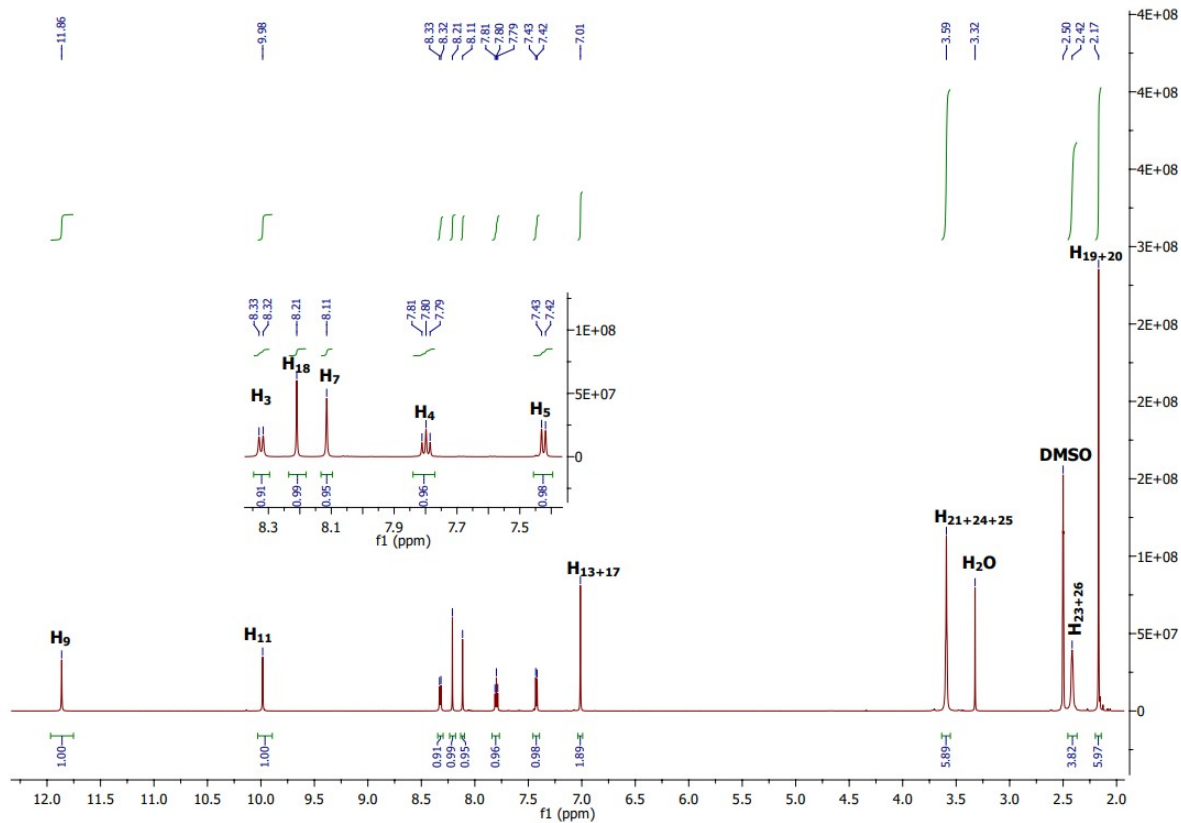


Figure S1A.  $^1\text{H}$  NMR spectrum of  $\text{HL}^1$ .

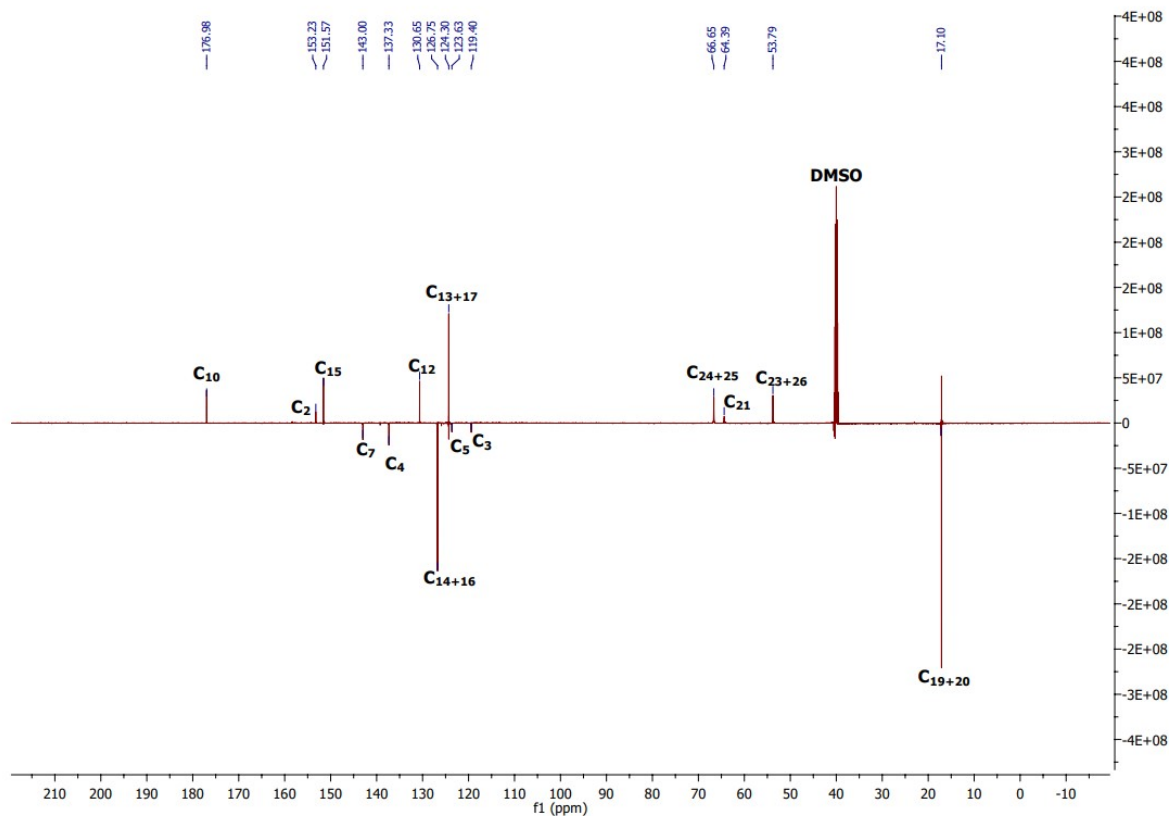


Figure S1B.  $^{13}\text{C}$  NMR spectrum of  $\text{HL}^1$ .

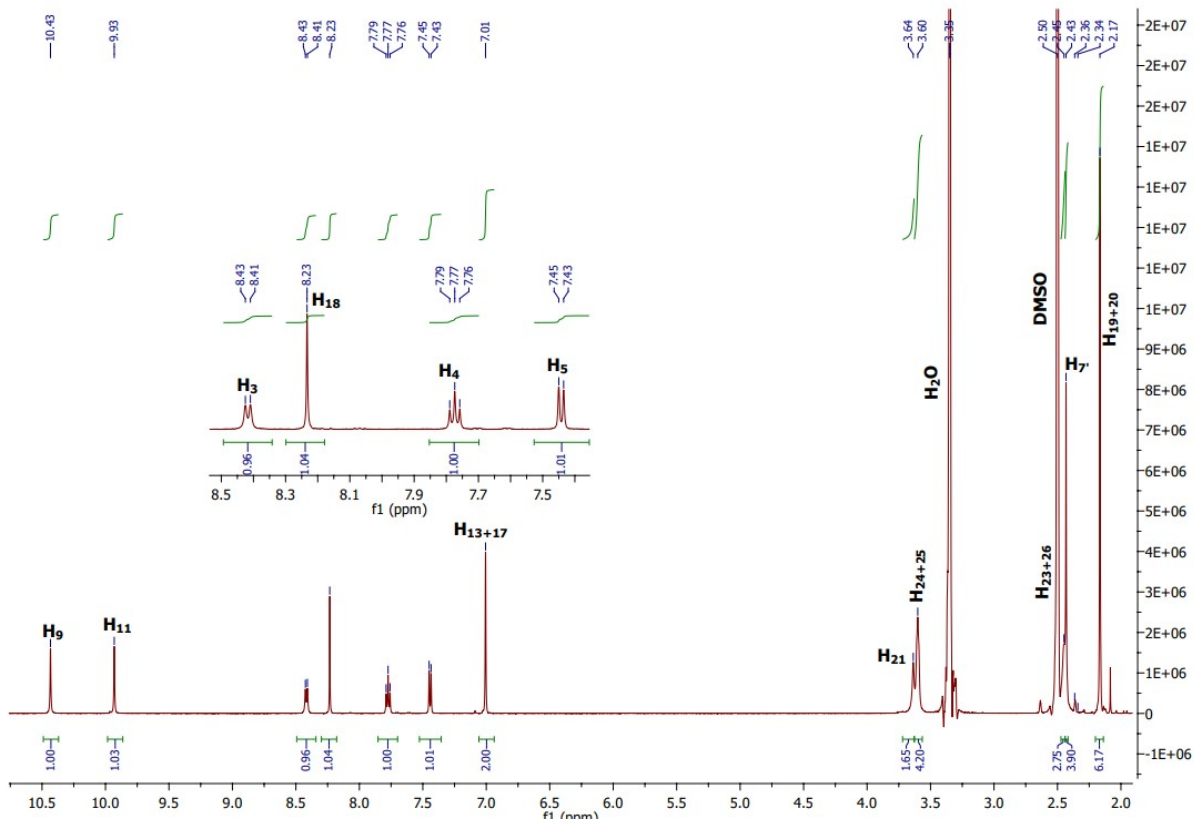


Figure S2A.  $^1\text{H}$  NMR spectrum of  $\text{HL}^2$ .

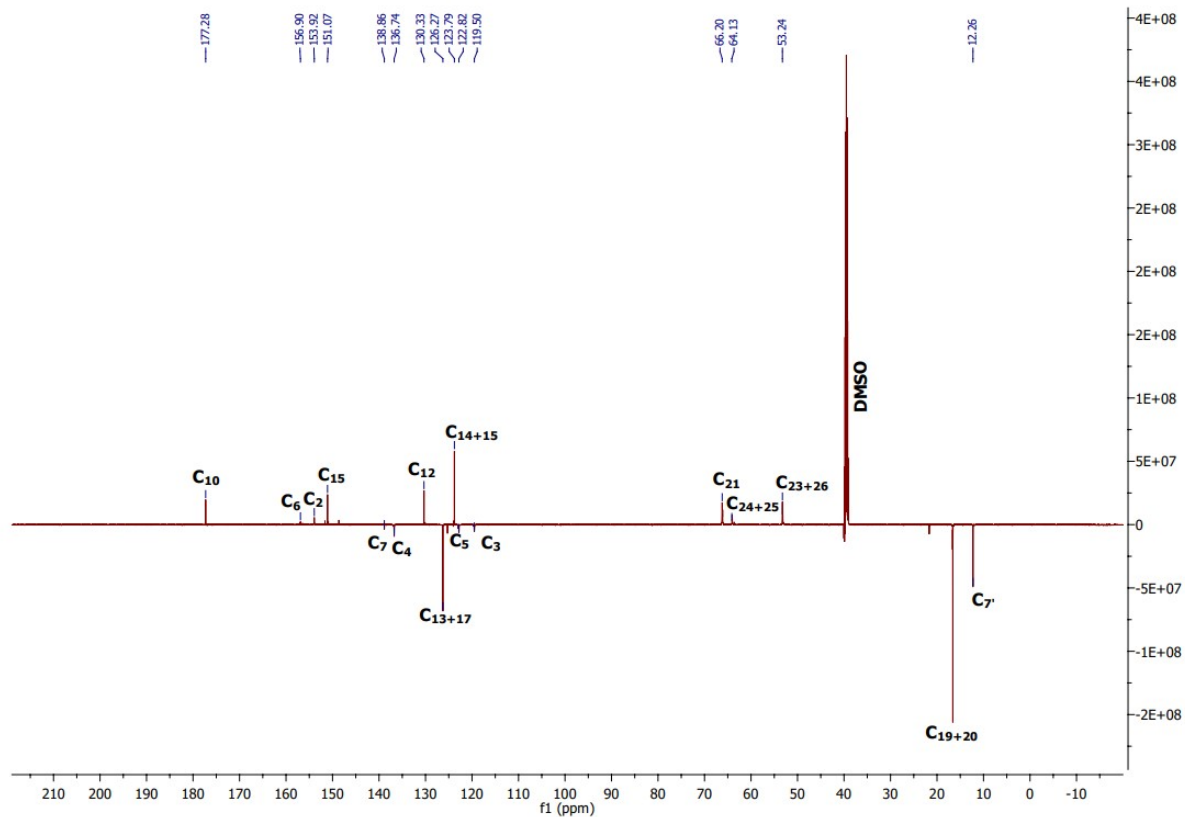


Figure S2B.  $^{13}\text{C}$  NMR spectrum of  $\text{HL}^2$ .

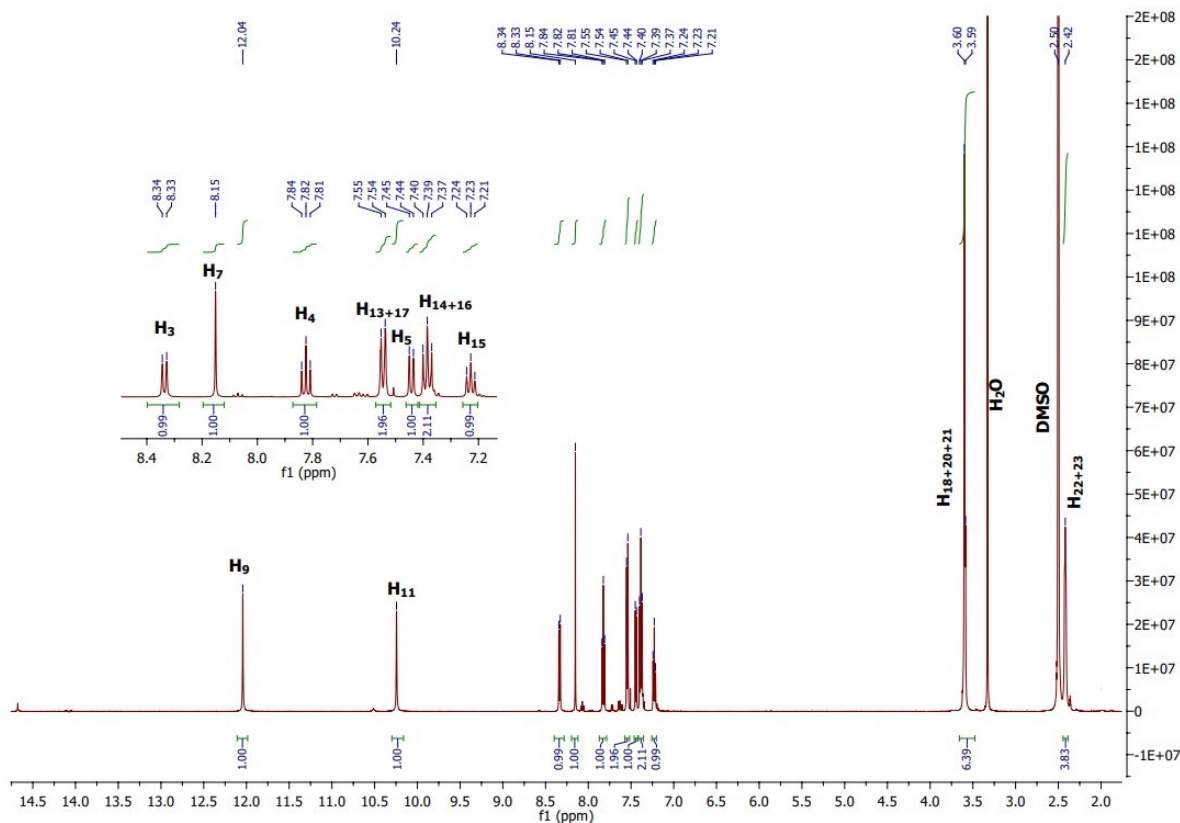


Figure S3A.  $^1\text{H}$  NMR spectrum of  $\text{HL}^3$ .

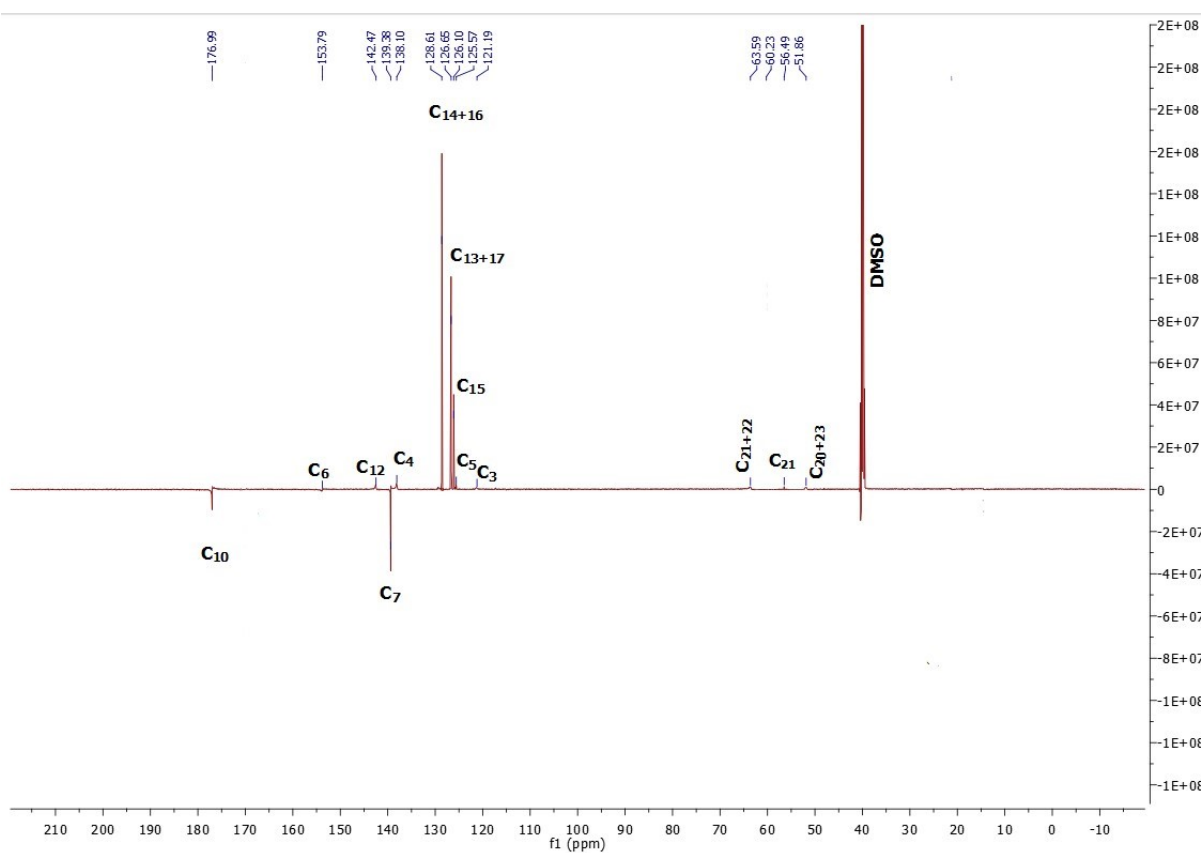


Figure S3B.  $^{13}\text{C}$  NMR spectrum of  $\text{HL}^3$ .

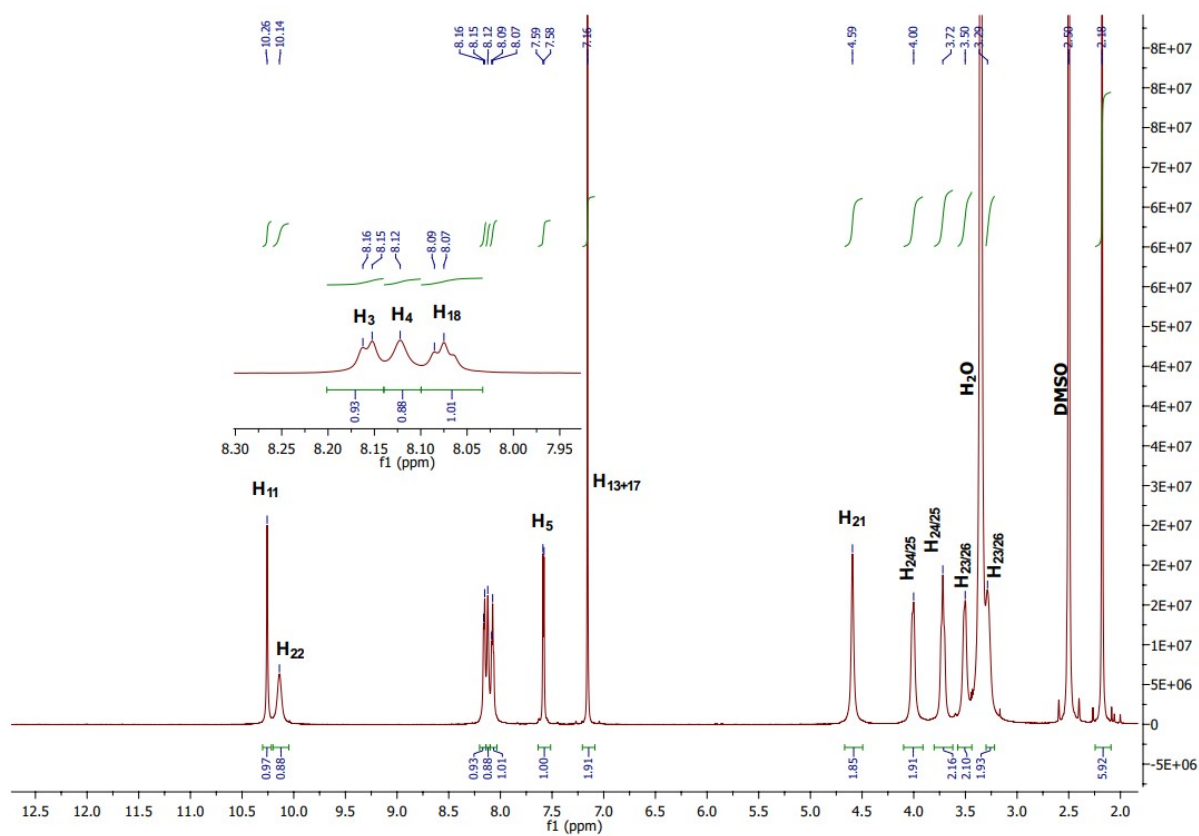


Figure S4A.  $^1\text{H}$  NMR spectrum of  $\text{HL}^{1'}$ .

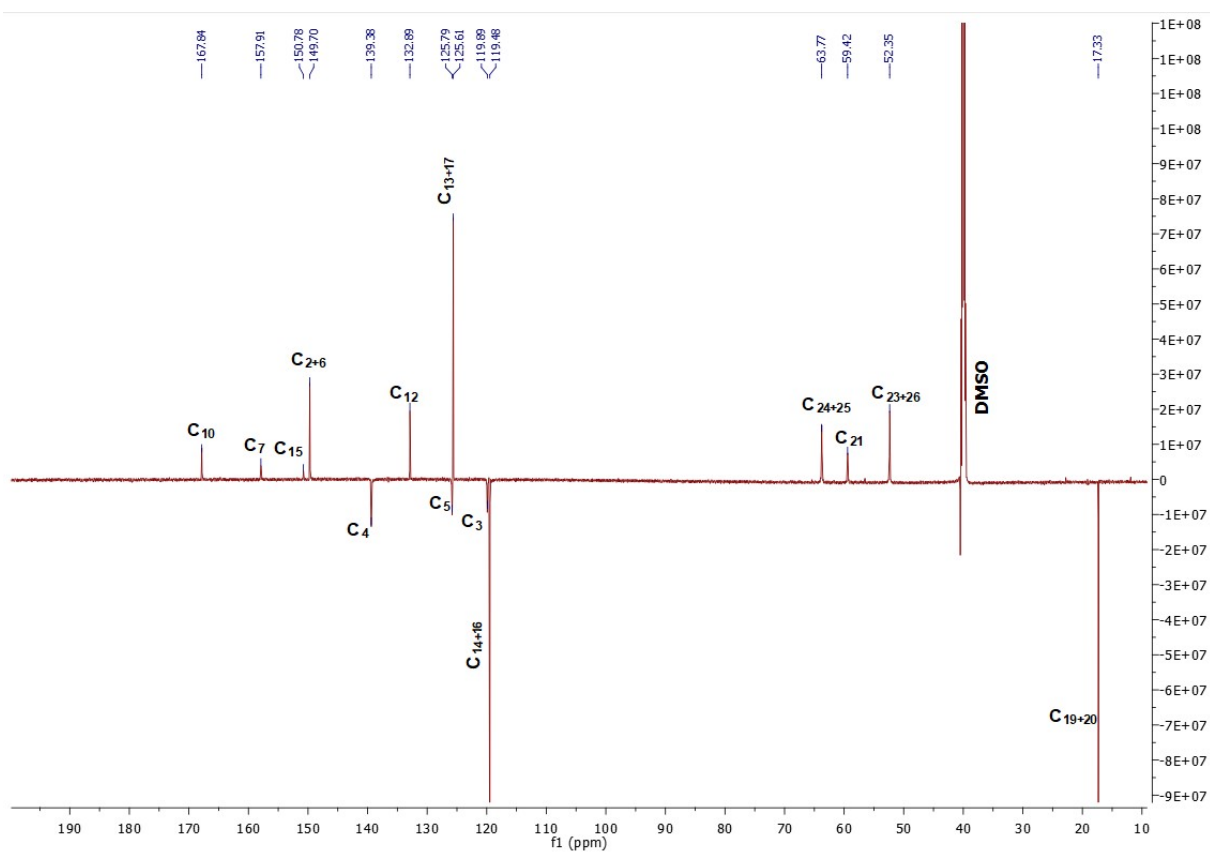


Figure S4B.  $^{13}\text{C}$  NMR spectrum of  $\text{HL}^{1'}$ .

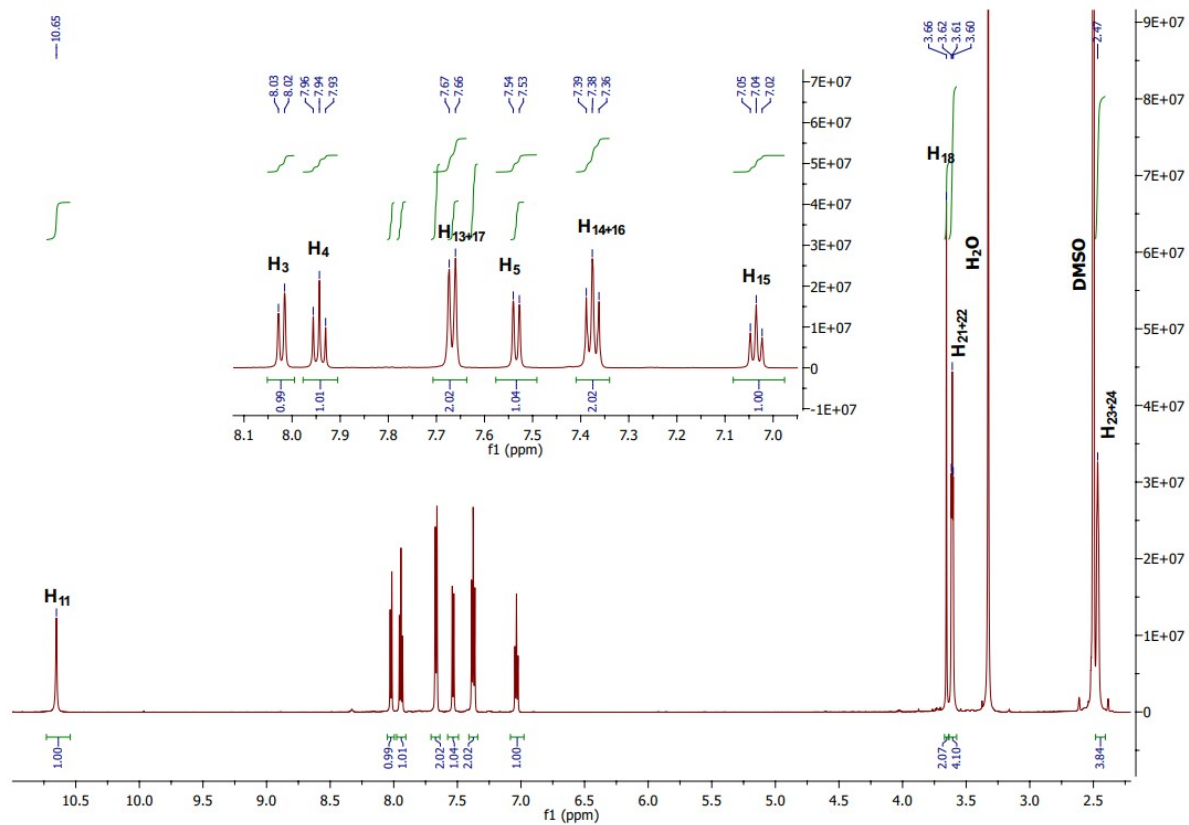


Figure S5A.  $^1\text{H}$  NMR spectrum of  $\text{HL}^{3'}$ .

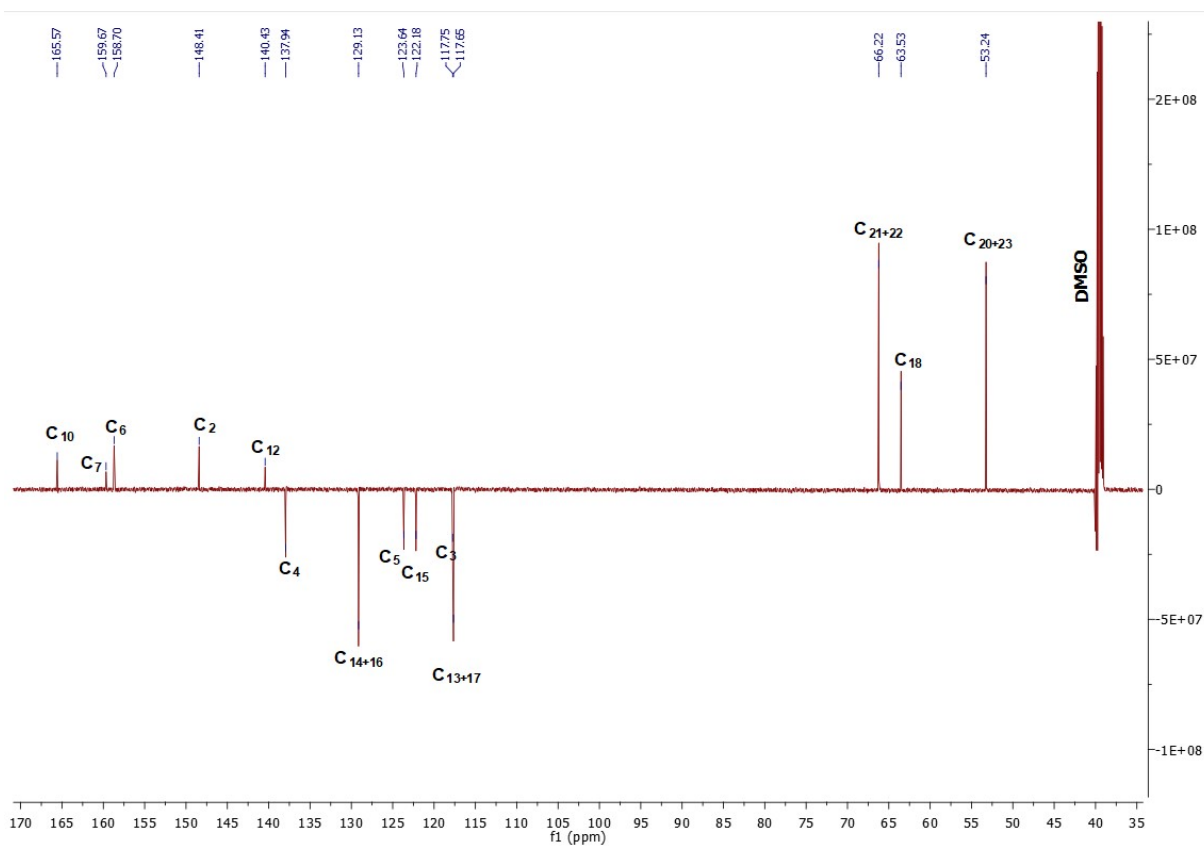


Figure S5B.  $^{13}\text{C}$  NMR spectrum of  $\text{HL}^{3'}$ .



Assignment of proton resonances in  $^1\text{H}$  NMR spectra of the morp-TSCs (solvent:  $\text{DMSO-}d_6$ ).

		<b>HL<sup>1</sup> (E<sup>-</sup>)</b>	<b>HL<sup>1'</sup></b>	<b>HL<sup>2</sup> (E<sup>-</sup>)</b>	<b>HL<sup>3</sup> (E<sup>-</sup>)</b>	<b>HL<sup>3'</sup></b>
H <sub>3</sub>	CH <sub>py</sub>	8.32 (d, 1H)	8.16 (d, 1H)	8.42 (d, 1H)	8.34 (s, 1H)	8.02 (d, 1H)
H <sub>4</sub>	CH <sub>py</sub>	7.80 (t, 1H)	8.08 (d, 1H)	7.77 (t, 1H)	7.82 (s, 1H)	7.95 (d, 1H)
H <sub>5</sub>	CH <sub>py</sub>	7.42 (d, 1H)	7.58 (d, 1H)	7.44 (d, 1H)	7.54 (s, 1H)	7.53 (d, 1H)
H <sub>7</sub>	CH=N	8.11 (s, 1H)	-	-	8.15 (s, 1H)	-
H <sub>7'</sub>	CH <sub>3</sub> (C=N)	-	-	2.45 (s, 3H)	-	-
H <sub>9</sub>	NH (closer to py)	11.86 (s, 1H)	-	10.43 (s, 1H)	12.04 (s, 1H)	-
H <sub>11</sub>	NH (closer to ph)	9.98 (s, 1H)	10.26 (s, 1H)	9.93 (s, 1H)	10.24 (s, 1H)	10.65 (s, 1H)
H <sub>13+17</sub>	CH <sub>ph</sub>	7.01 (s, 2H)	7.16 (s, 2H)	7.01 (s, 2H)	7.44 (d, 2H)	7.67 (d, 2H)
H <sub>14+16</sub>	CH <sub>ph</sub>	-	-	-	7.39 (t, 2H)	7.38 (t, 2H)
H <sub>15</sub>	CH <sub>ph</sub>	-	-	-	7.23 (t, 1H)	7.04 (s, 1H)
H <sub>18</sub>	OH <sub>ph</sub>	8.21 (s, 1H)	8.12 (s, 1H)	8.23 (s, 1H)	-	-
H <sub>19+20</sub>	CH <sub>3</sub>	2.17 (s, 6H)	2.18 (s, 6H)	2.17 (s, 6H)	-	-
H <sub>22</sub> (H <sub>19</sub> for <b>HL<sup>3</sup></b> and <b>HL<sup>3'</sup></b> )	NH <sub>(morph)</sub>	-	10.14 (s, 1H)	-	11.38 (s, 1H)	-
H <sub>21</sub> (H <sub>18</sub> for <b>HL<sup>3</sup></b> and <b>HL<sup>3'</sup></b> )	CH <sub>2</sub> -N <sub>(morph)</sub>		4.59 (s, 2H)	3.64 (s, 2H)		3.66 (s, 2H)
H <sub>24+25</sub> (H <sub>21+22</sub> for <b>HL<sup>3</sup></b> and <b>HL<sup>3'</sup></b> )	CH <sub>2</sub> <sub>(morph)</sub> (closer to O)	3.59 (s, 6H)	4.00 (s, 2H) 3.72 (s, 2H)	3.60 (s, 4H)	3.59 (s, 6H)	3.61 (m, 4H)
H <sub>23+26</sub> (H <sub>20+23</sub> for <b>HL<sup>3</sup></b> and <b>HL<sup>3'</sup></b> )	CH <sub>2</sub> <sub>(morph)</sub> (closer to N)	2.42 (s, 4H)	3.50 (s, 2H) 3.29 (s, 2H)	2.43 (s, 4H)	2.42 (s, 4H)	2.47 (s, 4H)

Assignment of  $^{13}\text{C}$  resonances in  $^{13}\text{C}$  NMR spectra of the morph-TSCs (solvent:  $\text{DMSO-}d_6$ ).

		<b>HL<sup>1</sup> (E-)</b>	<b>HL<sup>1'</sup></b>	<b>HL<sup>2</sup> (E-)</b>	<b>HL<sup>3</sup> (E-)</b>	<b>HL<sup>3'</sup></b>
C <sub>2</sub>	C <sub>py</sub>	153.23	149.67	153.92	149.17*	148.41
C <sub>3</sub>	CH <sub>py</sub> /C <sub>py</sub>	119.40	119.89	119.50	121.19	117.75
C <sub>4</sub>	CH <sub>py</sub>	137.33	139.38	136.74	138.10	137.94
C <sub>5</sub>	CH <sub>py</sub>	123.63	125.79	122.82	125.57	123.64
C <sub>6</sub>	CH <sub>py</sub>	158.16*	149.70	156.90	153.76	158.70
C <sub>7</sub>	C=N	143.00	-	138.86	139.38	-
C <sub>7</sub>	thiadiazole	-	157.91	-	-	159.67
C <sub>7'</sub>	CH <sub>3</sub> (C=N)	-	-	12.26	-	-
C <sub>10</sub>	C=S	176.98	-	177.28	176.99	-
C <sub>10</sub>	S-C-N	-	167.84	-	-	165.57
C <sub>12</sub>	C <sub>ph</sub>	130.65	132.89	130.33	142.47	140.43
C <sub>13+17</sub>	CH <sub>ph</sub>	126.75	119.48	126.27	126.65	117.65
C <sub>14+16</sub>	C(CH <sub>3</sub> ) <sub>ph</sub>	124.30	125.61	123.79	128.61	129.13
C <sub>15</sub>	C(OH) <sub>ph</sub>	151.57	150.77	151.07	126.10	122.18
C <sub>19+20</sub>	C(CH <sub>3</sub> ) <sub>ph</sub>	17.10	17.33	16.60	-	-
C <sub>21</sub> (C <sub>18</sub> for <b>HL<sup>3</sup></b> and <b>HL<sup>3'</sup></b> )	CH <sub>2</sub> -N <sub>(morph)</sub>	64.39	59.42	66.20	60.23	63.53
C <sub>24+25</sub> (C <sub>21+22</sub> for <b>HL<sup>3</sup></b> and <b>HL<sup>3'</sup></b> )	CH <sub>2</sub> (morph) (closer to O)	66.65	63.77	64.13	63.59	66.22
C <sub>23+26</sub> (C <sub>20+23</sub> for <b>HL<sup>3</sup></b> and <b>HL<sup>3'</sup></b> )	CH <sub>2</sub> (morph) (closer to N)	53.79	52.35	53.24	51.86	53.24

\*Resonances were assigned by using  $^1\text{H}$ - $^{13}\text{C}$  HSQC,  $^1\text{H}$ - $^{13}\text{C}$  HMBC and  $^1\text{H}$ - $^1\text{H}$  COSY NMR spectra.

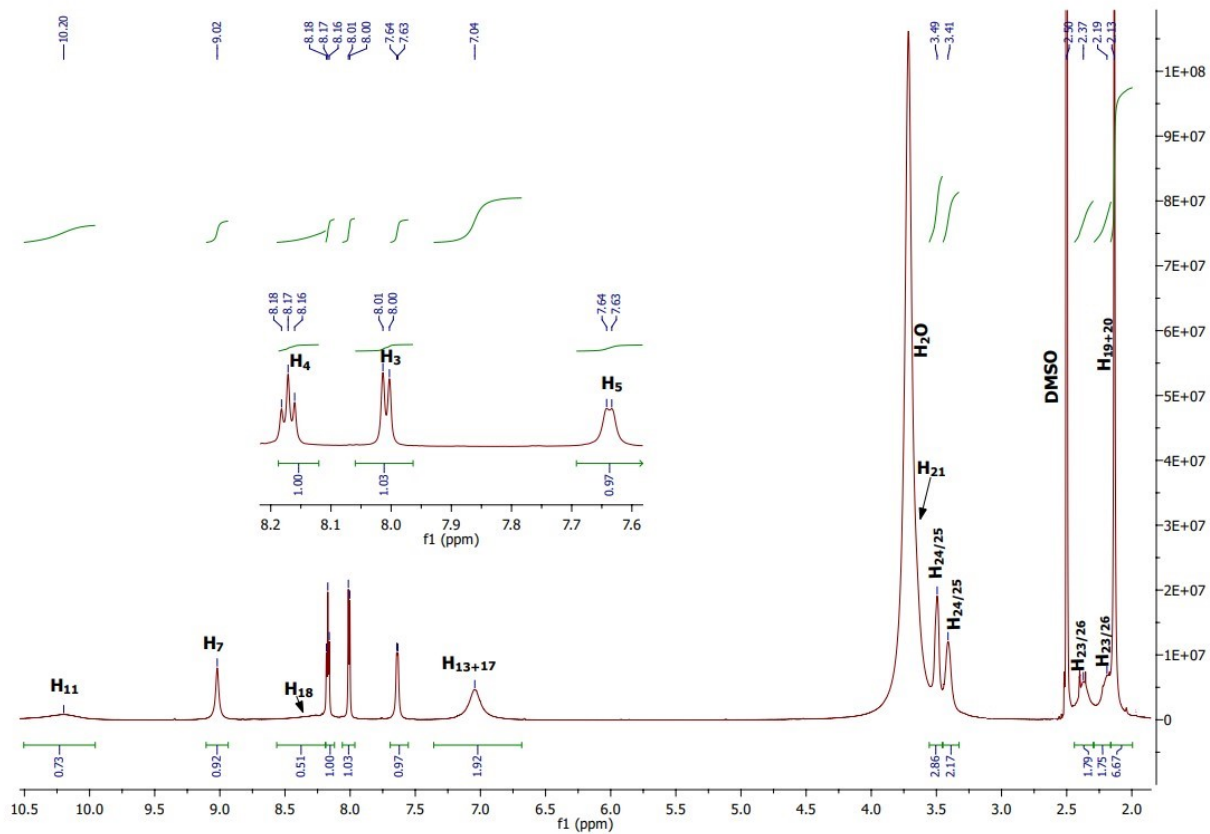


Figure S6A.  $^1\text{H}$  NMR spectrum of **1**.

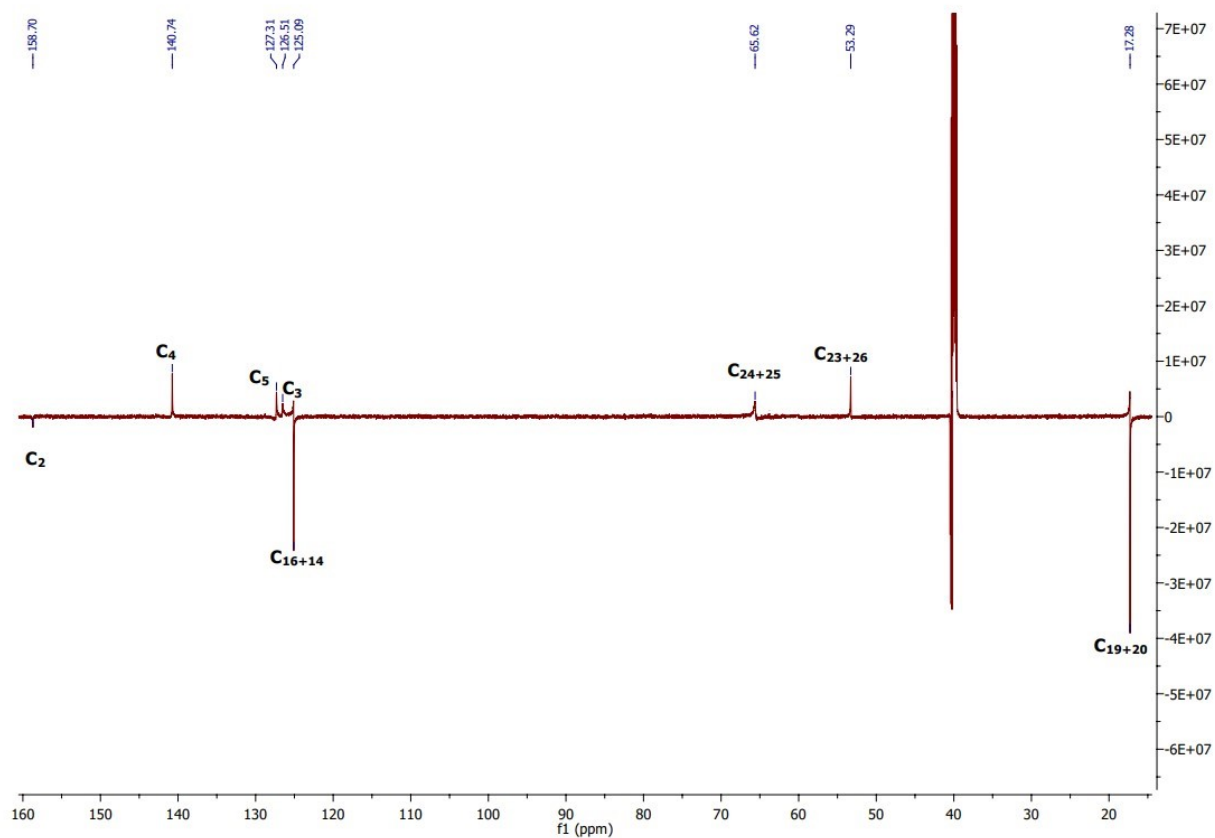


Figure S6B.  $^{13}\text{C}$  NMR spectrum of **1**.

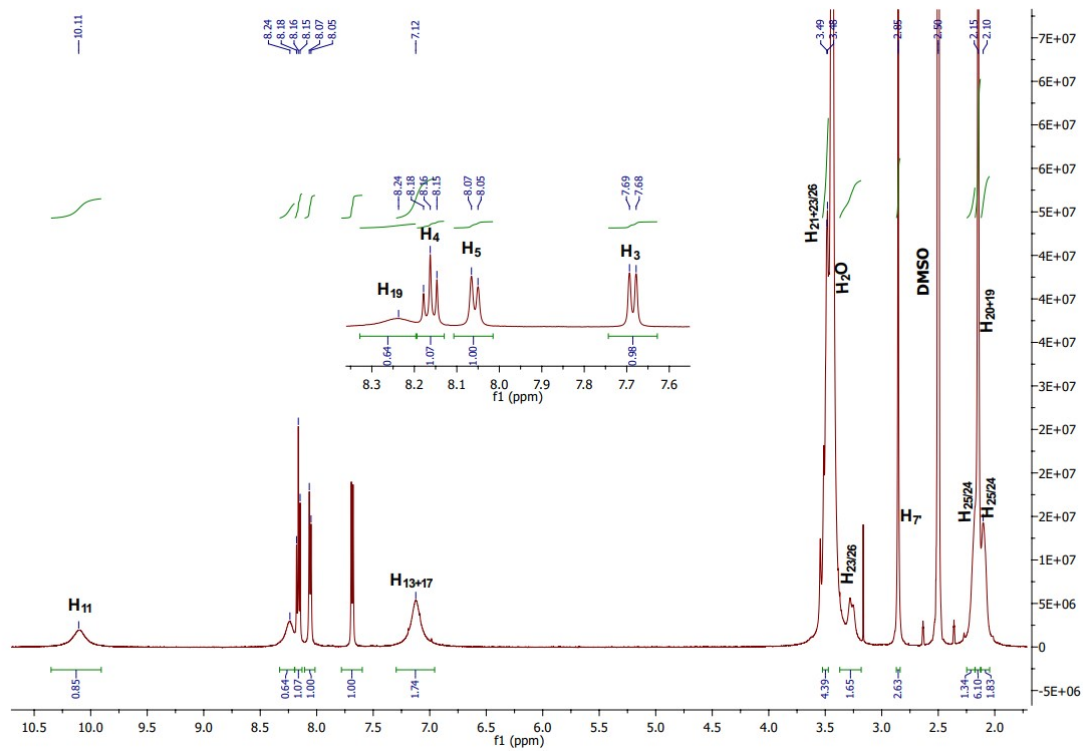


Figure S7A.  $^1\text{H}$  NMR spectrum of **2**.

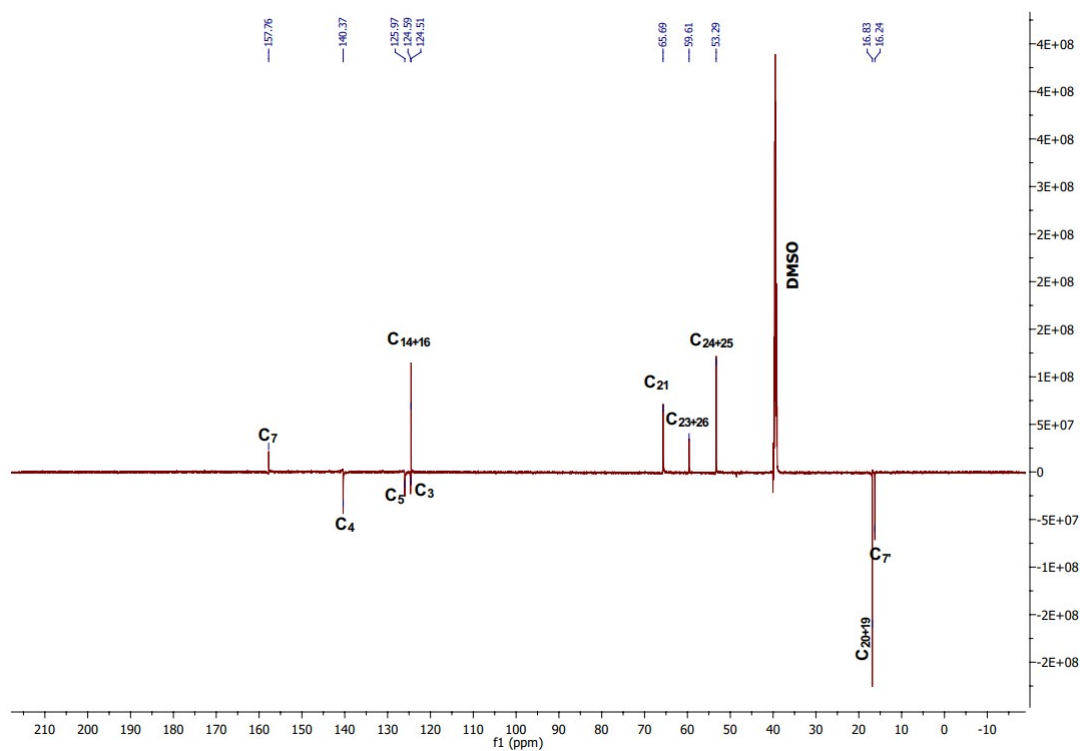


Figure S7B.  $^{13}\text{C}$  NMR spectrum of **2**.

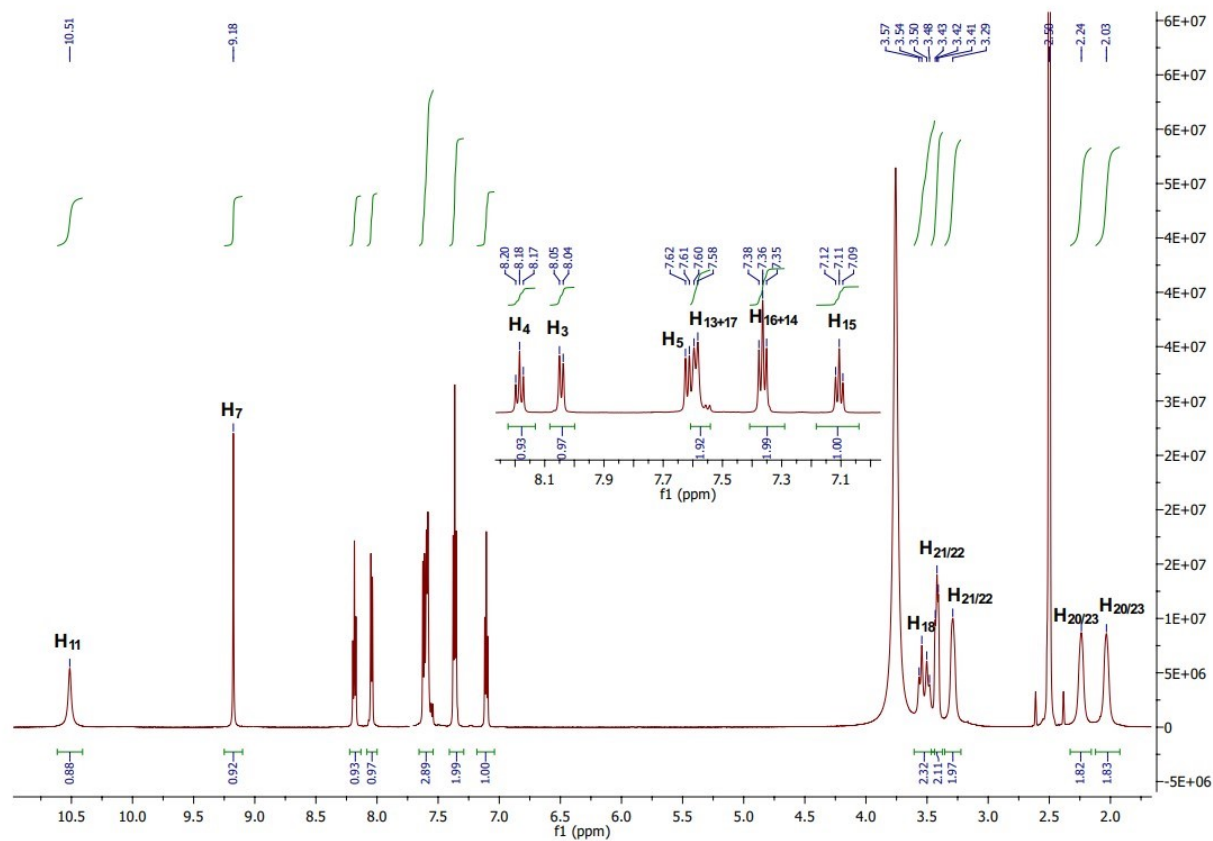


Figure S8A.  $^1\text{H}$  NMR spectrum of **3**.

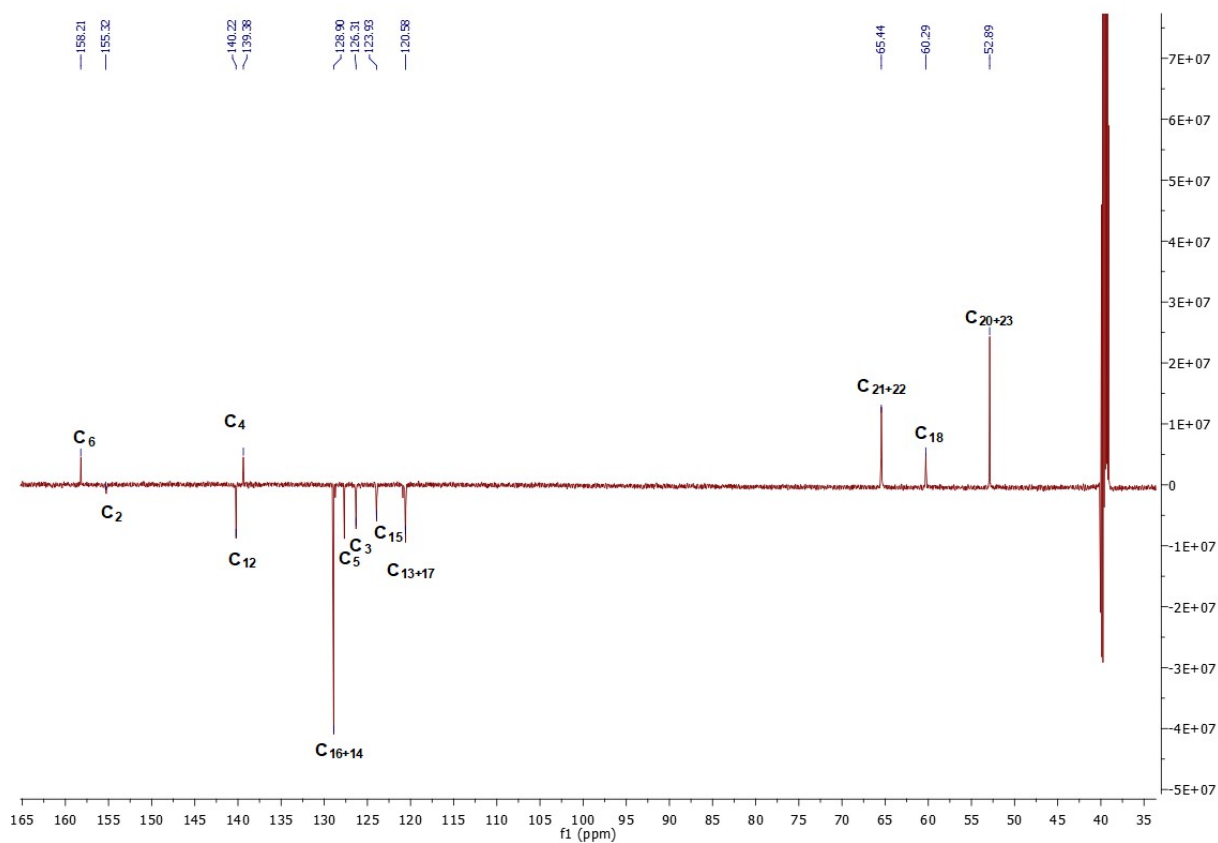


Figure S8B.  $^{13}\text{C}$  NMR spectrum of **3**.

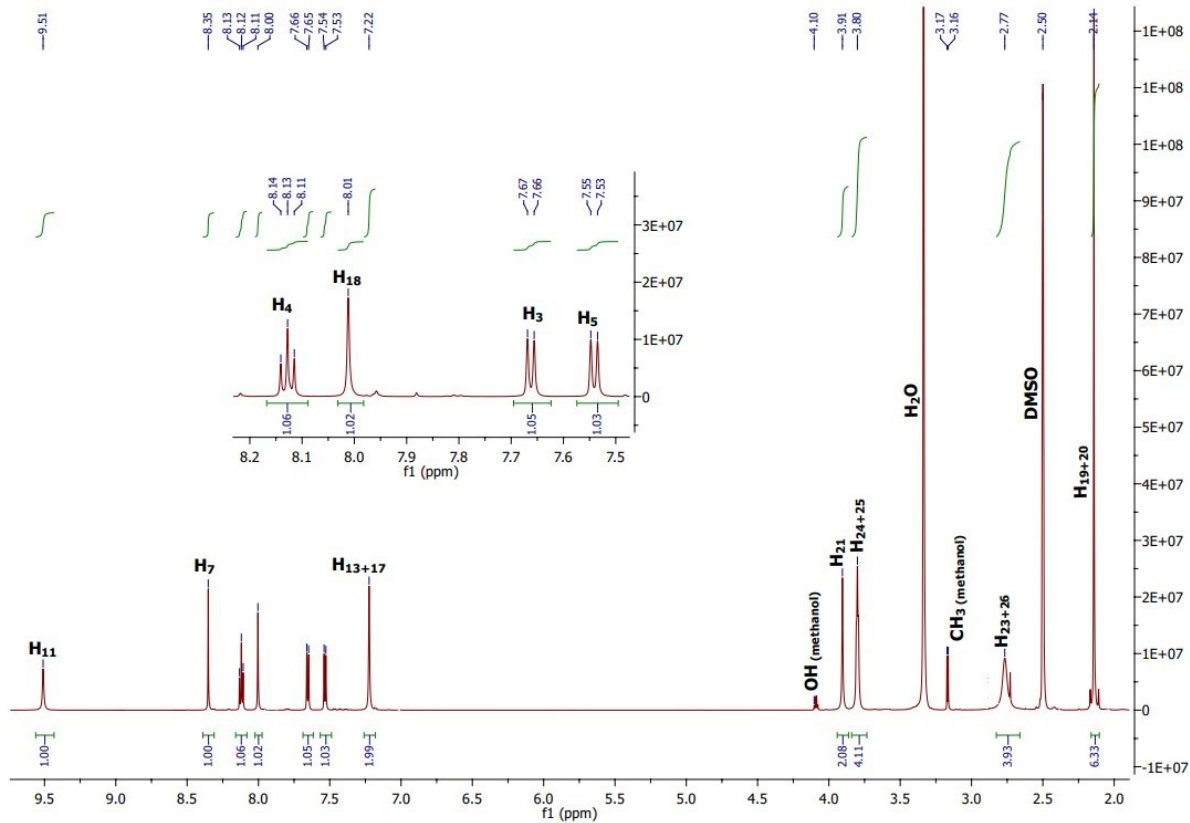


Figure S9A.  $^1\text{H}$  NMR spectrum of 7.

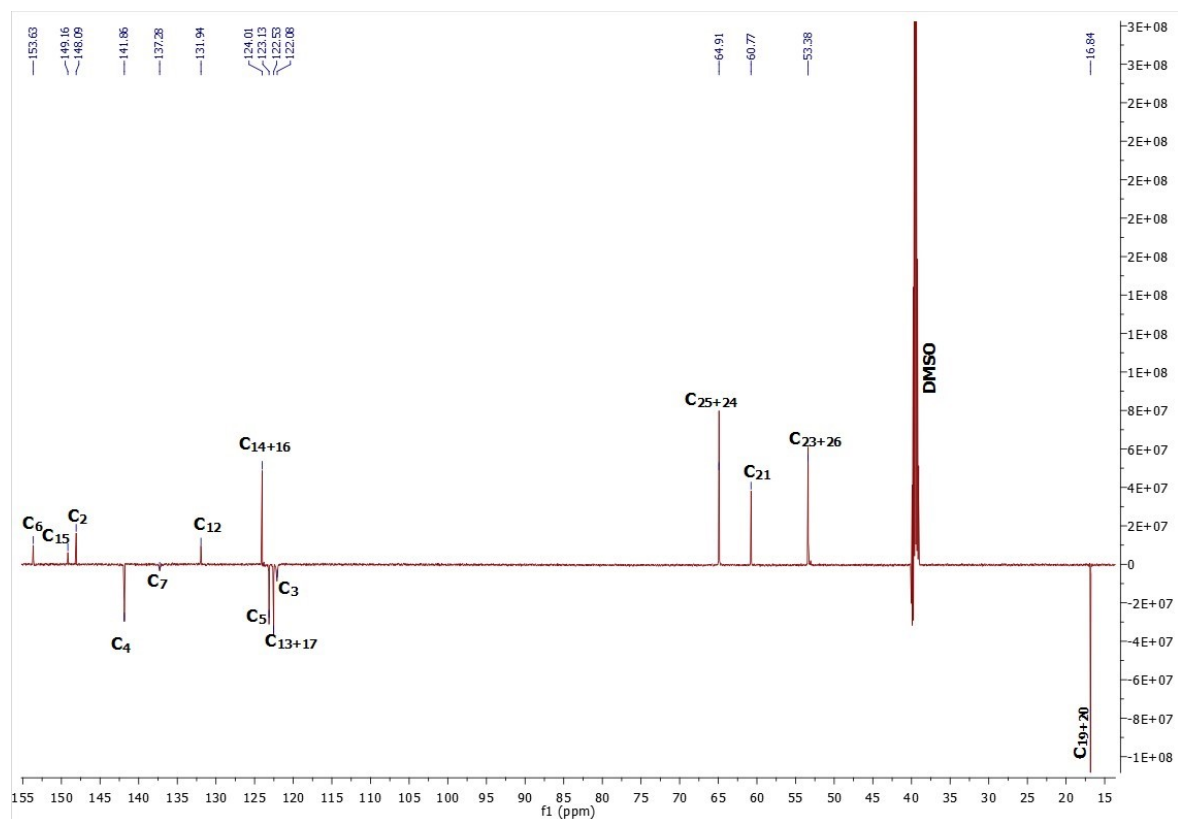


Figure S9B.  $^{13}\text{C}$  NMR spectrum of 7.

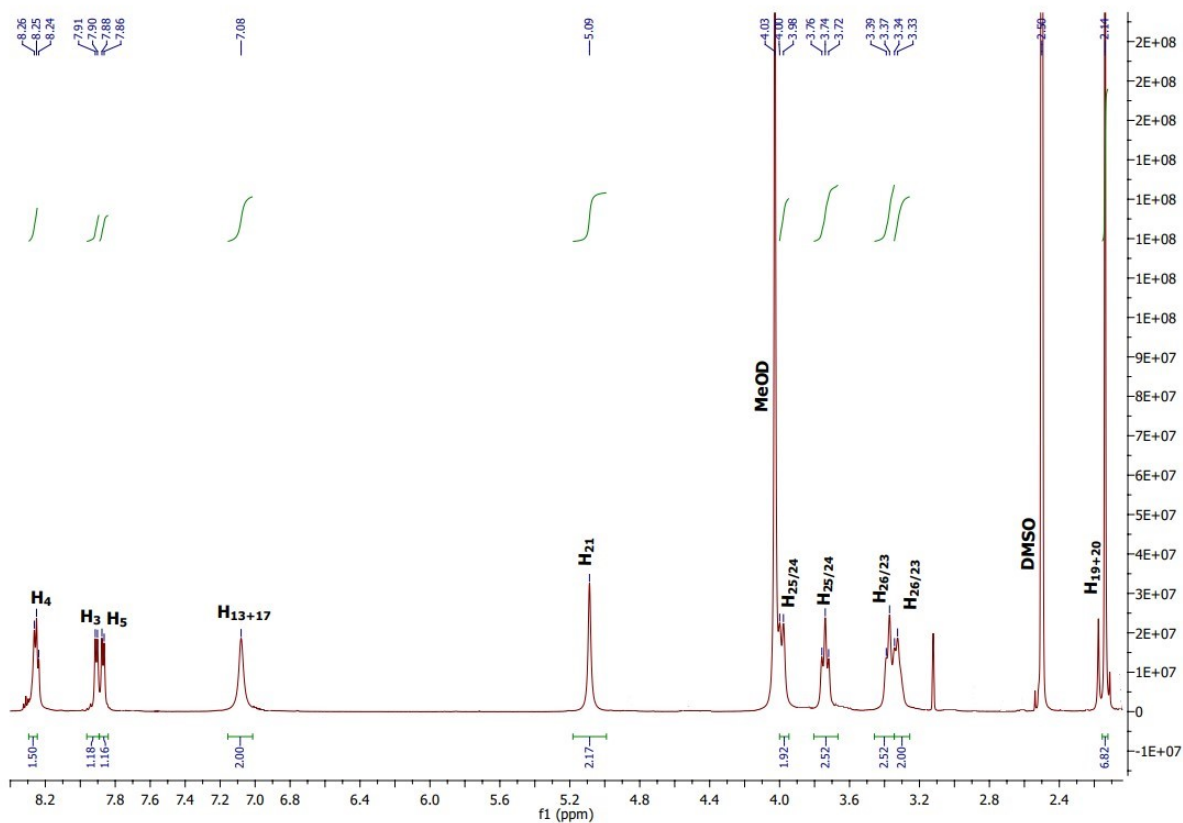


Figure S10A.  $^1\text{H}$  NMR spectrum of **8**.

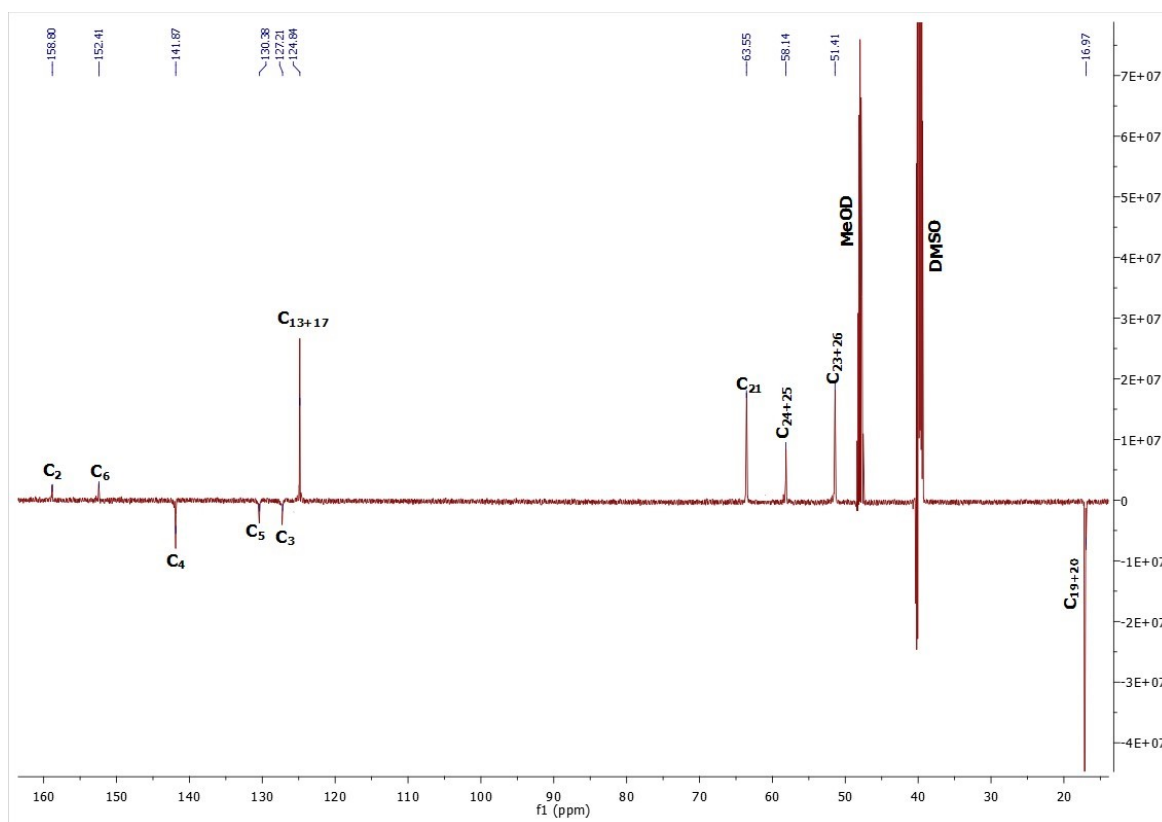


Figure S10B.  $^{13}\text{C}$  NMR spectrum of **8**.

Assignment of proton resonances in  $^1\text{H}$  NMR spectra of **1**, **7** and **8** (solvent:  $\text{DMSO-}d_6$ ).

		<b>HL<sup>1</sup> (E-)</b>	<b>1</b>	<b>7</b>	<b>8*</b>
H <sub>3</sub>	CH <sub>py</sub>	8.32 (d, 1H)	8.01 (d, 1H)	7.66 (d, 1H)	7.91 (d, 1H)
H <sub>4</sub>	CH <sub>py</sub>	7.80 (t, 1H)	8.17 (t, 1H)	8.13 (t, 1H)	8.26 (t, 1H)
H <sub>5</sub>	CH <sub>py</sub>	7.42 (d, 1H)	7.64 (d, 1H)	7.54 (d, 1H)	7.87 (d, 1H)
H <sub>7</sub>	CH=N	8.11 (s, 1H)	9.02 (s, 1H)	8.36 (s, 1H)	not detected
H <sub>9</sub>	NH (closer to py)	11.86 (s, 1H)	-	-	-
H <sub>11</sub>	NH (closer to ph)	9.98 (s, 1H)	10.20 (s, 1H)	9.52 (s, 1H)	not detected
H <sub>13+17</sub>	CH <sub>ph</sub>	7.01 (s, 2H)	7.04 (b, 2H)	7.23 (s, 2H)	7.08 (s, 2H)
H <sub>18</sub>	OH <sub>ph</sub>	8.21 (s, 1H)	8.56 – 8.19 (b, 1H)	8.01 (s, 1H)	not detected
H <sub>19+20</sub>	CH <sub>3ph</sub>	2.17 (s, 6H)	2.13 (s, 6H)	2.15 (s, 6H)	2.14 (s, 6H)
H <sub>22</sub>	NH <sub>(morph)</sub>	-	-	-	-
H <sub>21</sub>	CH <sub>2</sub> -N <sub>(morph)</sub>	3.59 (s, 6H)	3.69 (s, 4H)* + (H <sub>24/25</sub> )	3.91 (s, 2H)	5.09 (s, 2H)
H <sub>24+25</sub>	CH <sub>2</sub> morph (closer to O)		3.49 (s, 2H)	3.81 (s, 4H)	3.98 (m, 1H)
			3.41 (s, 2H)		3.74 (m, 1H)
H <sub>23+26</sub>	CH <sub>2</sub> morph (closer to N)	2.42 (s, 4H)	2.37 (s, 2H)	2.77 (s, 4H)	3.37 (m, 1H)
			2.19 (s, 2H)		3.33 (m, 1H)

\*Measured in  $\text{DMSO-}d_6$  + 10% MeOD- $d_4$ .



Assignment of  $^{13}\text{C}$  resonances in  $^{13}\text{C}$  NMR spectra of **1**, **7** and **8** (solvent:  $\text{DMSO-}d_6$ ).

		<b>HL<sup>1</sup> (E-)</b>	<b>1</b>	<b>7</b>	<b>8*</b>
C <sub>2</sub>	C <sub>py</sub>	153.23	158.70	148.09	158.80
C <sub>3</sub>	CH <sub>py</sub> /C <sub>py</sub>	119.40	126.51	122.53	127.21
C <sub>4</sub>	CH <sub>py</sub>	137.33	140.74	141.86	141.87
C <sub>5</sub>	CH <sub>py</sub>	123.63	127.31	123.13	130.38
C <sub>6</sub>	CH <sub>py</sub>	158.16	not detected	153.63	152.41
C <sub>7</sub>	C=N	143.00	not detected	137.28	not detected
C <sub>10</sub>	C=S	176.98	-	-	-
C <sub>10</sub>	S-C-N	-	not detected	not detected	not detected
C <sub>12</sub>	C <sub>ph</sub>	130.65	not detected	131.94	not detected
C <sub>13+17</sub>	CH <sub>ph</sub>	126.75	not detected	122.08	124.84
C <sub>14+16</sub>	C(CH <sub>3</sub> ) <sub>ph</sub>	124.30	125.09	124.01	not detected
C <sub>15</sub>	C(OH) <sub>ph</sub>	151.57	151.04*	149.16	not detected
C <sub>19+20</sub>	C(CH <sub>3</sub> ) <sub>ph</sub>	17.10	17.28	16.84	16.97
C <sub>21</sub>	CH <sub>2</sub> -N <sub>(morph)</sub>	64.39	60.06*	60.77	63.55
C <sub>24+25</sub>	CH <sub>2</sub> (morph) (closer to O)	66.65	65.62	64.91	58.14
C <sub>23+26</sub>	CH <sub>2</sub> (morph) (closer to N)	53.79	53.29	53.38	51.41

\*Resonances were assigned by using  $^1\text{H}$ - $^{13}\text{C}$  HSQC,  $^1\text{H}$ - $^{13}\text{C}$  HMBC and  $^1\text{H}$ - $^1\text{H}$  COSY NMR spectra.

## 2. Crystallographic data collection

**Table S1.** Crystal Data and Details of Data Collection and Refinement for [Co<sup>III</sup>(HL<sup>1</sup>)(L<sup>1</sup>)](NO<sub>3</sub>)<sub>2</sub>·H<sub>2</sub>O (**1**), [Co<sup>III</sup>(HL<sup>3</sup>)(L<sup>3</sup>)](NO<sub>3</sub>)<sub>2</sub>(**3**), [Fe<sup>III</sup>(L<sup>2</sup>)<sub>2</sub>]NO<sub>3</sub> (**4**), [Fe<sup>III</sup>(HL<sup>3</sup>)(L<sup>3</sup>)](NO<sub>3</sub>)<sub>2</sub> (**6**).

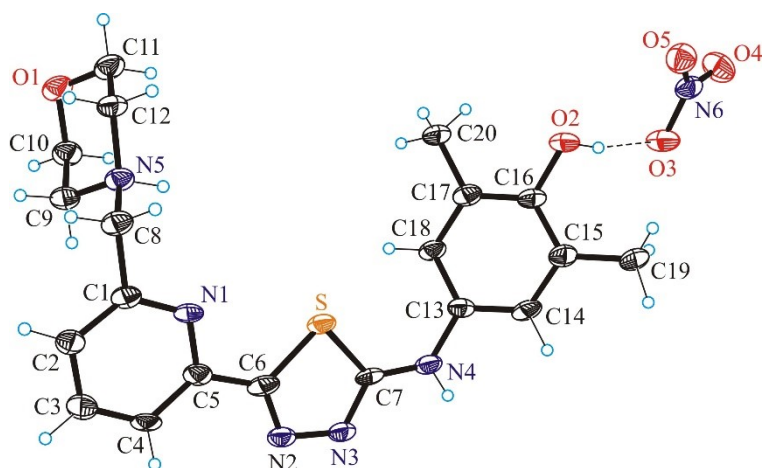
compound	[Co <sup>III</sup> (HL <sup>1</sup> )(L <sup>1</sup> )](NO <sub>3</sub> ) <sub>2</sub> ·H <sub>2</sub> O	[Co <sup>III</sup> (HL <sup>3</sup> )(L <sup>3</sup> )](NO <sub>3</sub> ) <sub>2</sub>	[Fe <sup>III</sup> (L <sup>2</sup> ) <sub>2</sub> ]NO <sub>3</sub>	[Fe <sup>III</sup> (HL <sup>3</sup> )(L <sup>3</sup> )](NO <sub>3</sub> ) <sub>2</sub>
empirical formula	C <sub>40</sub> H <sub>51</sub> CoN <sub>12</sub> O <sub>11</sub> S <sub>2</sub>	C <sub>38</sub> H <sub>49</sub> CoN <sub>12</sub> O <sub>10</sub> S <sub>2</sub>	C <sub>42.65</sub> H <sub>54.60</sub> FeN <sub>11</sub> O <sub>7.65</sub> S <sub>2</sub>	C <sub>36</sub> H <sub>41</sub> FeN <sub>12</sub> O <sub>8</sub> S <sub>2</sub>
fw	998.97	956.94	963.74	889.78
space group	<i>P</i> 2 <sub>1</sub> / <i>c</i>	<i>P</i> 2 <sub>1</sub> / <i>n</i>	<i>P</i> 2 <sub>1</sub> / <i>n</i>	<i>P</i> 2 <sub>1</sub> / <i>n</i>
<i>a</i> , Å	19.607(3)	17.659(4)	16.8583(16)	17.7730(5)
<i>b</i> , Å	17.3104(15)	9.9034(13)	13.8926(7)	9.9333(2)
<i>c</i> , Å	15.5505(15)	24.975(7)	21.7744(17)	24.8488(7)
$\alpha$ , °				
$\beta$ , °	109.389(10)	95.42(2)	107.706(7)	95.264(2)
$\gamma$ , °				
<i>V</i> [Å <sup>3</sup> ]	4978.7(11)	4348.1(17)	4858.1(7)	4368.4(2)
<i>Z</i>	4	4	4	4
$\lambda$ [Å]	0.71073	0.71073	0.71073	0.71073
$\rho_{\text{calcd}}$ , g cm <sup>-3</sup>	1.333	1.462	1.318	1.353
cryst size, mm <sup>3</sup>	0.17 × 0.11 × 0.04	0.25 × 0.12 × 0.03	0.20 × 0.12 × 0.01	0.30 × 0.14 × 0.02
<i>T</i> [K]	100(2)	100(2)	100(2)	100(2)
$\mu$ , mm <sup>-1</sup>	0.495	0.561	0.456	0.503
<i>R</i> <sub>1</sub> <sup>a</sup>	0.0526	0.0416	0.0851	0.0325
w <i>R</i> <sub>2</sub> <sup>b</sup>	0.1289	0.1053	0.2308	0.0762
GOF <sup>c</sup>	0.918	0.929	0.953	0.945
CCDC no.	2354137	2354138	2354139	2354140

<sup>a</sup>*R*<sub>1</sub> =  $\Sigma||F_o| - |F_c||/\Sigma|F_o|$ . <sup>b</sup>w*R*<sub>2</sub> =  $\{\Sigma[w(F_o^2 - F_c^2)^2]/\Sigma[w(F_o^2)^2]\}^{1/2}$ . <sup>c</sup>GOF =  $\{\Sigma[w(F_o^2 - F_c^2)^2]/(n - p)\}^{1/2}$ , where *n* is the number of reflections and *p* is the total number of parameters refined.

**Table S2.** Crystal Data and Details of Data Collection and Refinement for [Ni<sup>II</sup>(L<sup>1</sup>)]Cl·CH<sub>3</sub>OH, [Zn<sup>II</sup>(L<sup>1</sup>)]Cl·CH<sub>3</sub>OH and [Pd<sup>II</sup>(HL<sup>1</sup>)]ClCl

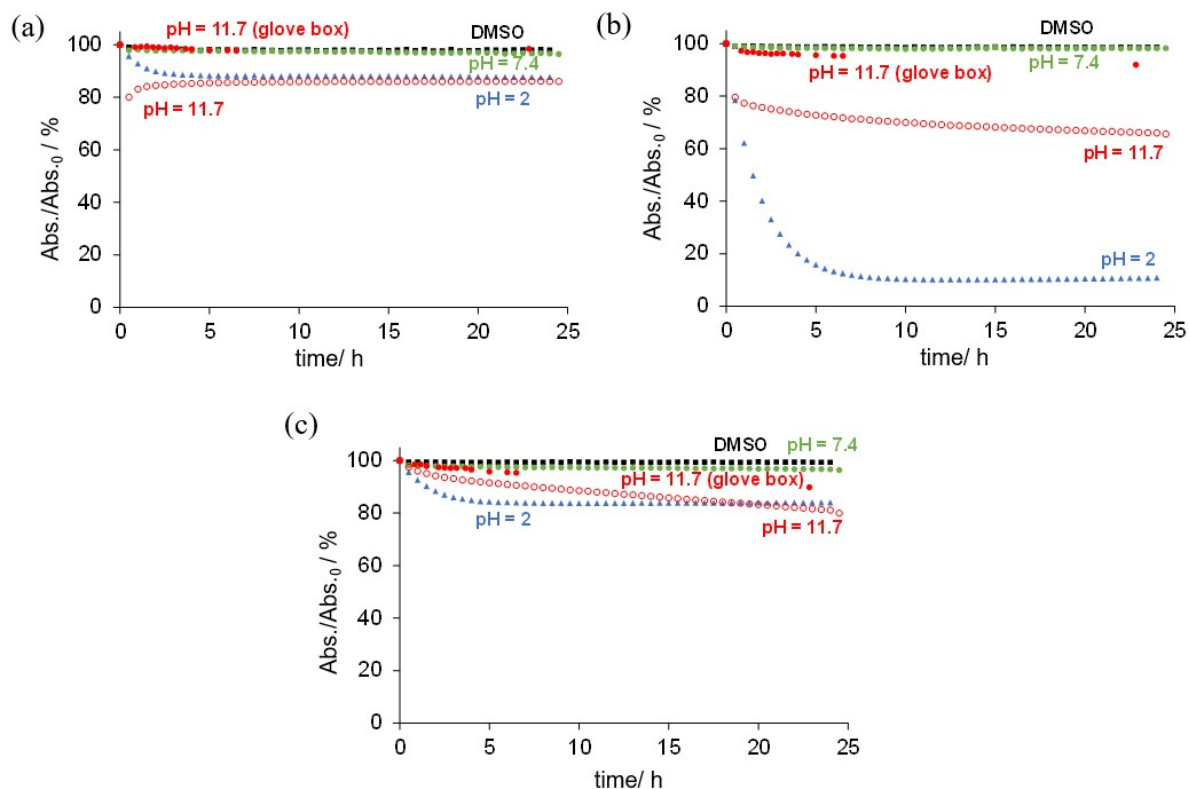
compound	[Ni <sup>II</sup> (L <sup>1</sup> )]Cl·CH <sub>3</sub> OH	[Zn <sup>II</sup> (L <sup>1</sup> )Cl]·CH <sub>3</sub> OH	[Pd <sup>II</sup> (HL <sup>1</sup> )Cl]Cl	[H <sub>2</sub> L <sup>1</sup> ]NO <sub>3</sub>
empirical formula	C <sub>21</sub> H <sub>28</sub> ClN <sub>5</sub> NiO <sub>3</sub> S	C <sub>20</sub> H <sub>24</sub> ClN <sub>5</sub> O <sub>2</sub> SZn	C <sub>20</sub> H <sub>27</sub> Cl <sub>2</sub> N <sub>5</sub> O <sub>3</sub> PdS	C <sub>20</sub> H <sub>24</sub> N <sub>6</sub> O <sub>5</sub> S
fw	524.70	499.32	576.81	460.51
space group	<i>Pnn2</i>	<i>P</i> $\bar{1}$	<i>I2/c</i>	<i>P2<sub>1</sub>/n</i>
<i>a</i> , Å	20.022(3)	9.5512(16)	13.9557(12)	13.9111(13)
<i>b</i> , Å	8.8256(10)	9.8642(17)	15.1993(13)	8.5430(6)
<i>c</i> , Å	17.135(2)	12.120(2)	24.0558(18)	18.0419(18)
$\alpha$ , °		87.313(14)		
$\beta$ , °		80.712(13)	102.430(5)	92.547(8)
$\gamma$ , °		70.063(12)		
<i>V</i> [Å <sup>3</sup> ]	3027.9(7)	1059.3(3)	4983.0(7)	2142.0(3)
<i>Z</i>	4	2	8	4
$\lambda$ [Å]	0.71073	0.71073	0.71073	1.54178
$\rho_{\text{calcd}}$ , g cm <sup>-3</sup>	1.151	1.565	1.538	1.428
cryst size, mm <sup>3</sup>	0.70 × 0.075 × 0.075	0.20 × 0.08 × 0.035	0.13 × 0.08 × 0.02	0.30 × 0.14 × 0.02
<i>T</i> [K]	296(2)	100(2)	100(2)	100(2)
$\mu$ , mm <sup>-1</sup>	0.824	1.412	1.069	1.744
<i>R</i> <sub>1</sub> <sup>a</sup>	0.0301	0.0565	0.0369	0.0700
<i>wR</i> <sub>2</sub> <sup>b</sup>	0.0603	0.1678	0.0687	0.2007
GOF <sup>c</sup>	1.022	1.088	0.854	0.985
CCDC no.	2354141	2354142	2354143	2354144

<sup>a</sup>  $R_1 = \Sigma||F_o| - |F_c||/\Sigma|F_o|$ . <sup>b</sup>  $wR_2 = \{\Sigma[w(F_o^2 - F_c^2)^2]/\Sigma[w(F_o^2)^2]\}^{1/2}$ . <sup>c</sup>  $\text{GOF} = \{\Sigma[w(F_o^2 - F_c^2)^2]/(n - p)\}^{1/2}$ , where *n* is the number of reflections and *p* is the total number of parameters refined.

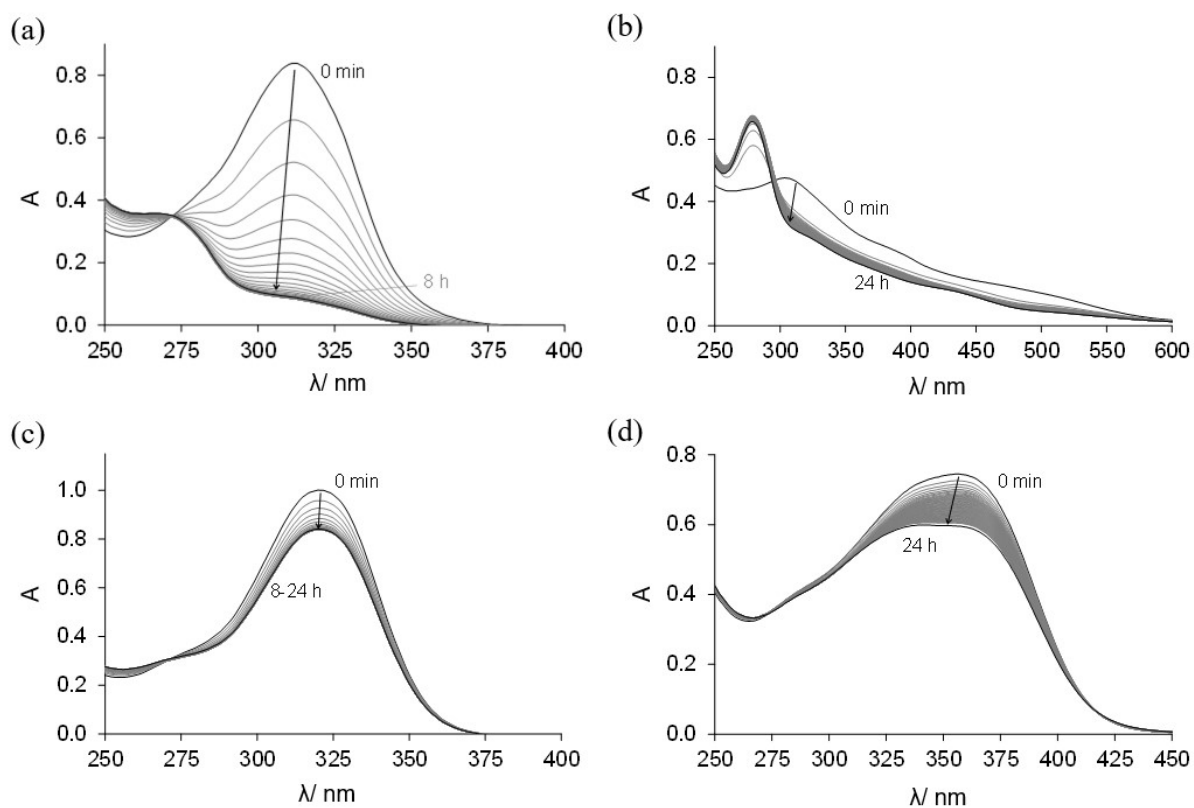


**Figure S11.** ORTEP view of  $[H_2L^1]NO_3$

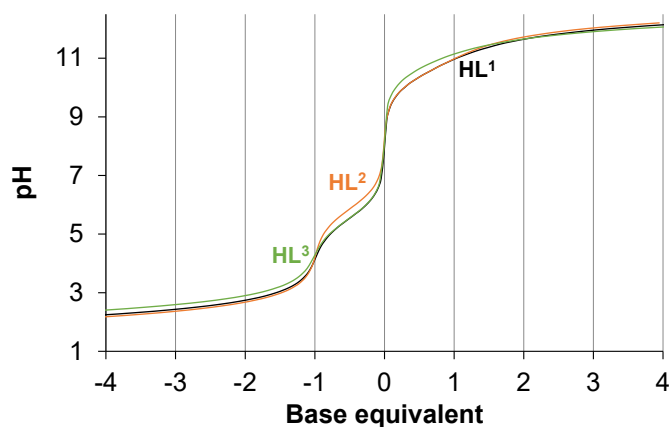
### 3. Solution Stability Studies



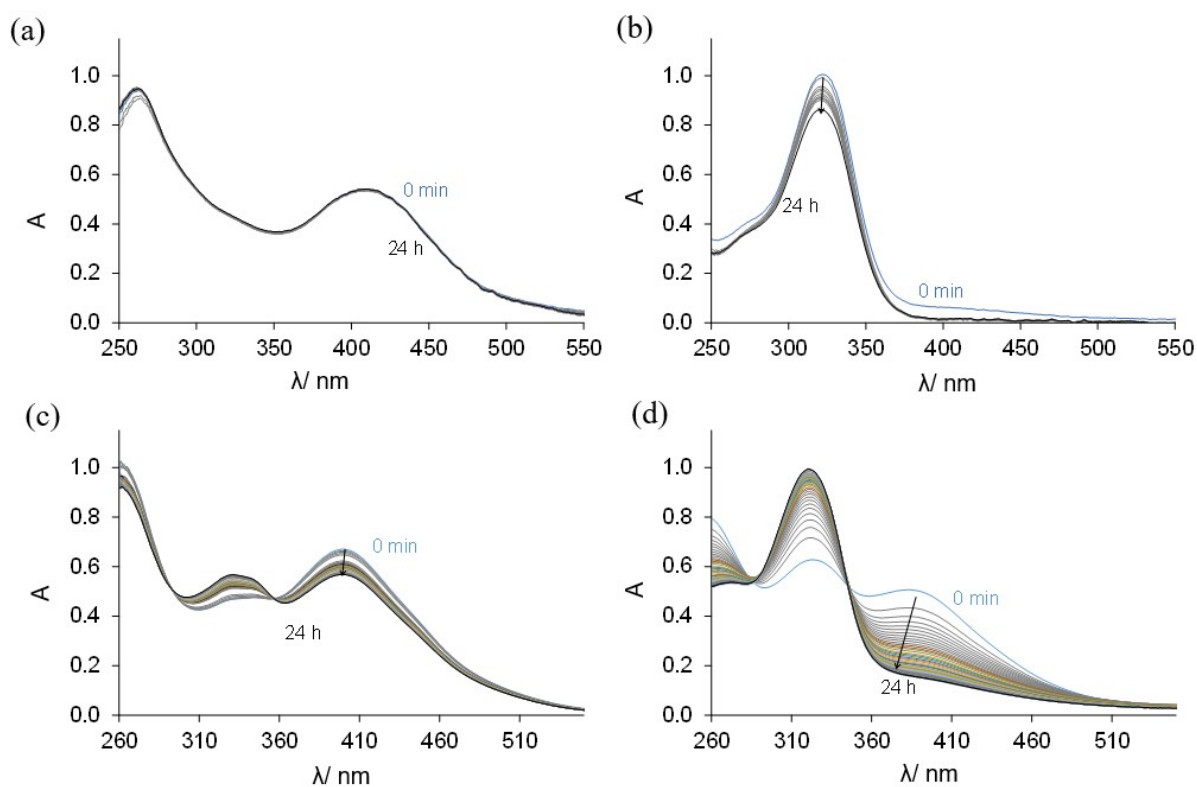
**Figure S12.** Changes of absorbance values measured for (a)  $HL^1$ , (b)  $HL^2$  and (c)  $HL^3$  in DMSO (■), at pH 2 (▲), at pH 7.4 (●), at pH 11.7 in glove box (●) and in a normal cuvette (○) over time at the absorbance maximum;  $\{c_{\text{ligand}} = 50 \mu\text{M}; \ell = 1 \text{ cm}; t = 25.0 \text{ }^\circ\text{C}\}$ .



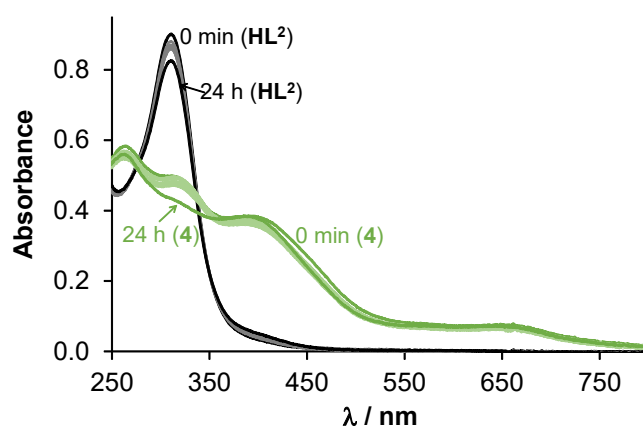
**Figure S13.** UV-vis absorption spectra recorded for **HL<sup>2</sup>** at (a) pH 2 and (b) pH 11.7, and for **HL<sup>3</sup>** at (c) pH 2 and (d) pH 11.7 over time;  $\{c_{\text{ligand}} = 50 \mu\text{M}; \ell = 1 \text{ cm}; t = 25.0 \text{ }^\circ\text{C}\}$ .



**Figure S14.** pH-potentiometric titration curves of the studied proligands **HL<sup>1</sup>**–**HL<sup>3</sup>** in 30% (v/v) DMSO/H<sub>2</sub>O. Base equivalent:  $(n_{\text{KOH}} - n_{\text{HCl}}) / n_{\text{ligand}}$ ;  $\{\ell = 1 \text{ cm}; I = 0.1 \text{ M (KCl)}; t = 25.0 \text{ }^\circ\text{C}\}$ .

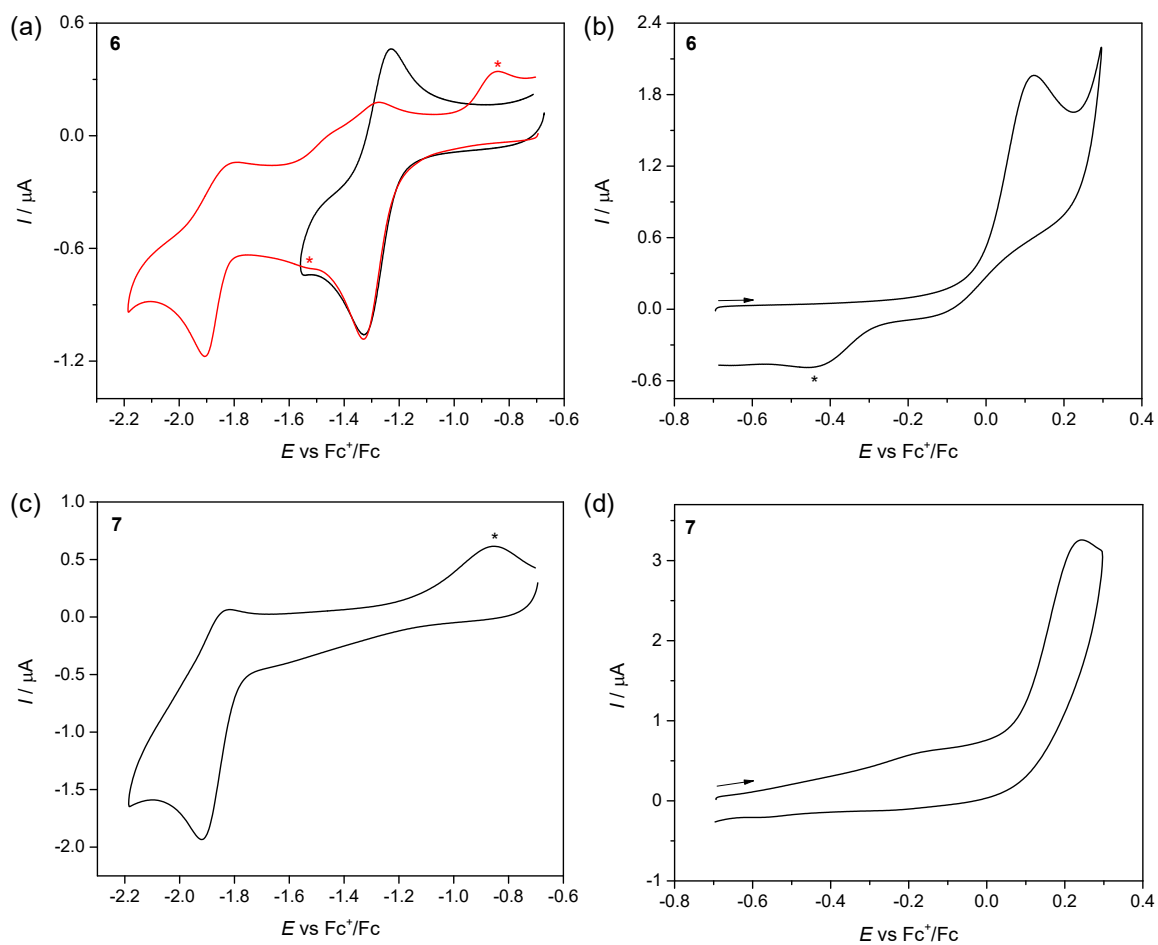


**Figure S15.** UV-vis absorption spectra recorded for (a) complex **2** at pH 2 and for complex **5** (b) at pH 2, (c) complex **2** in DMSO, and (d) complex **2** at pH 7.4 over time;  $\{c_{\text{complex}} = 21 \mu\text{M}$  (**2**) or  $23 \mu\text{M}$  (**5**);  $\ell = 1 \text{ cm}$ ;  $t = 25.0 \text{ }^\circ\text{C}\}$ .

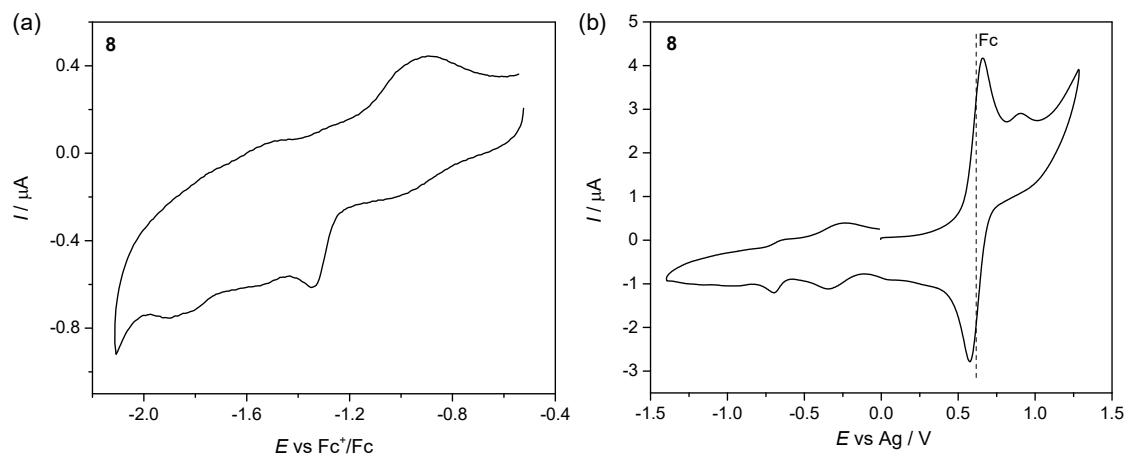


**Figure S16.** UV-vis absorption spectra recorded for complex **4** (green lines) and **HL<sup>2</sup>** (black lines) at pH 11.7 over time in the glove box;  $\{c = 23 \mu\text{M}$ ;  $\ell = 1 \text{ cm}$ ;  $t = 25.0 \text{ }^\circ\text{C}\}$ .

## 4. Spectroelectrochemistry

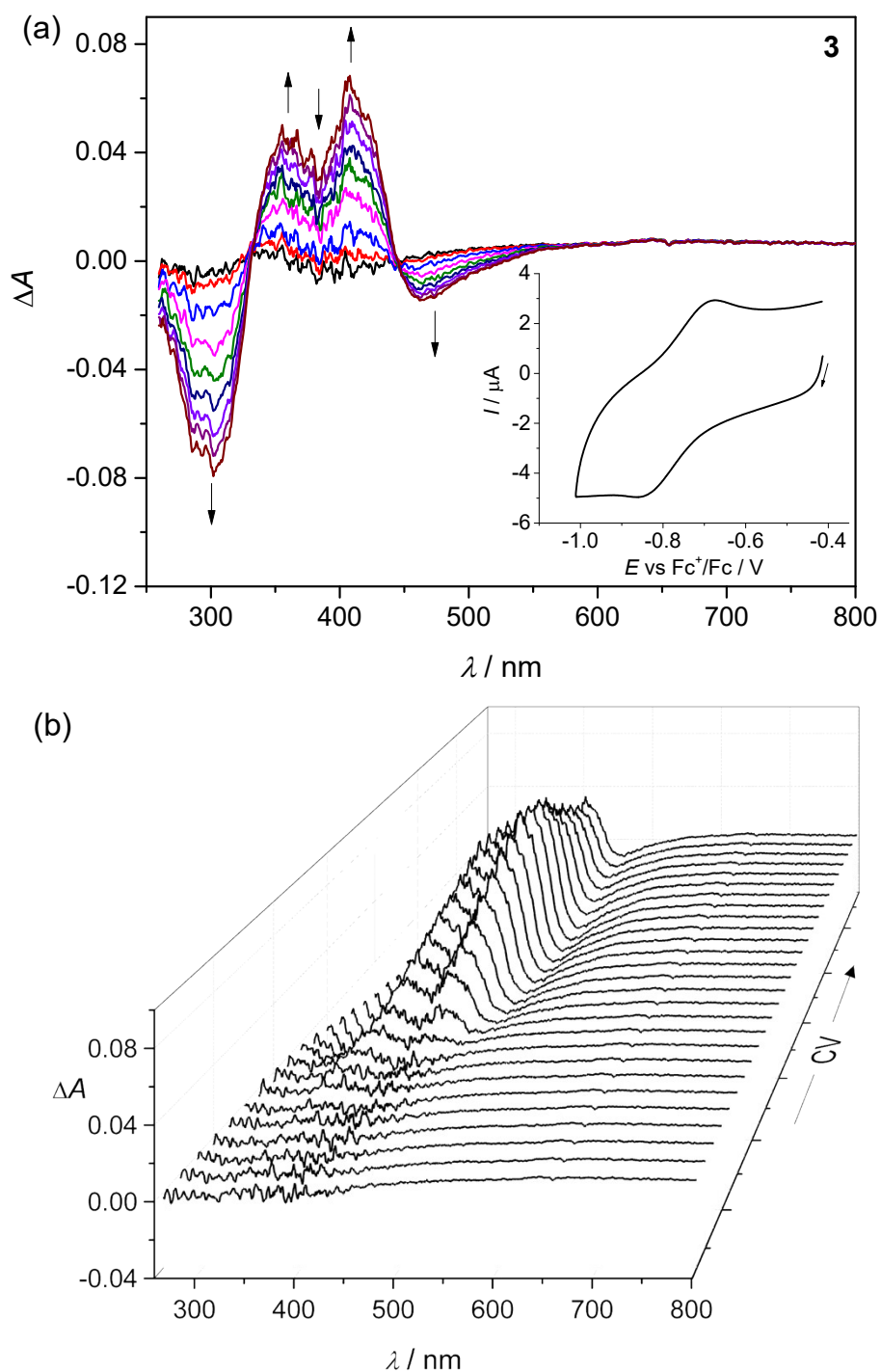


**Figure S17.** Cyclic voltammograms of the nickel complex **6** (a) in the cathodic and (b) in the anodic part, as well as of the zinc(II) complex **7** (c) in the cathodic and (d) in the anodic part in DMSO/ $nBu_4NPF_6$  (Pt working electrode, scan rate:  $100\text{ mV s}^{-1}$ ). Asterisk indicates the follow up products formed upon reduction and oxidation, respectively.

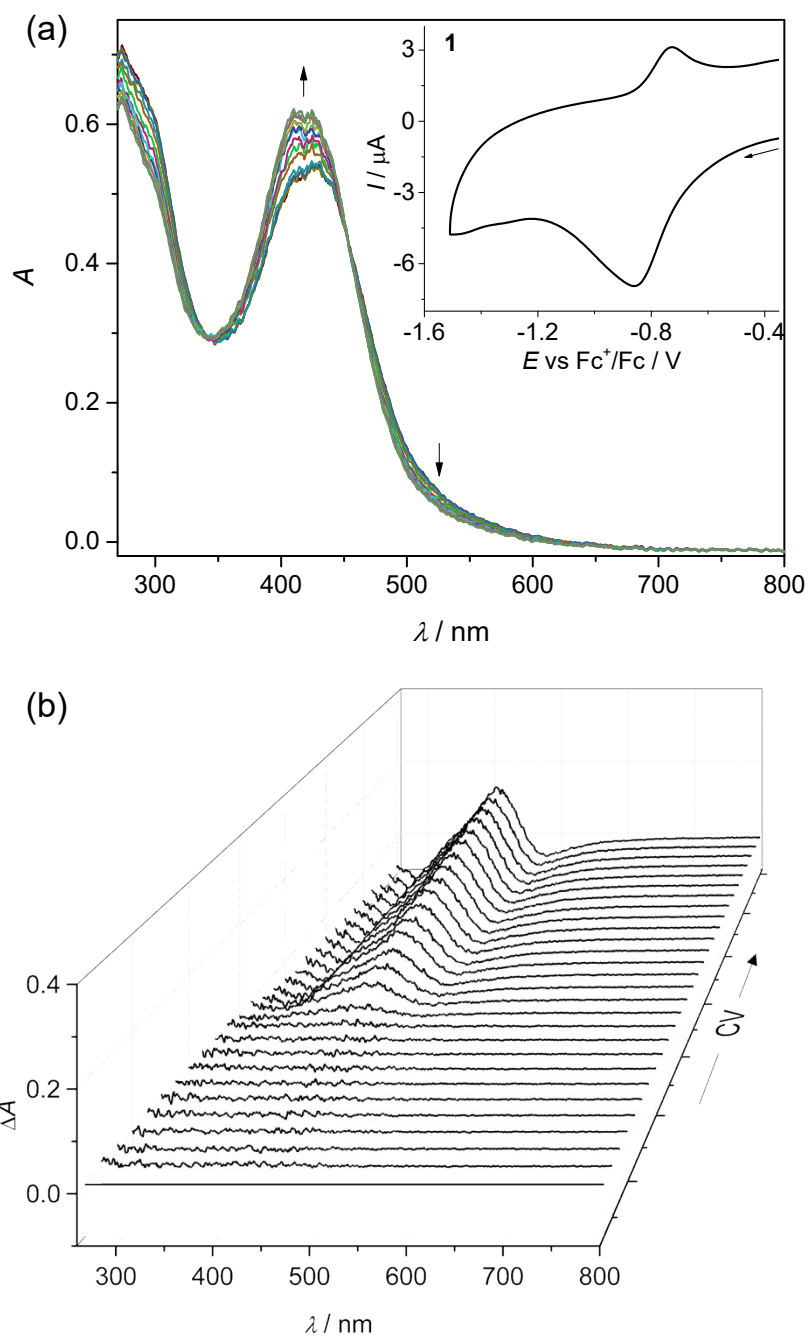


**Figure S18.** Cyclic voltammograms of palladium(II) complex **8** (a) in the cathodic part and (b) in both the anodic and cathodic parts in the presence of ferrocene in DMSO/*n*Bu<sub>4</sub>NPF<sub>6</sub> (Pt working electrode, scan rate: 100 mV s<sup>-1</sup>).

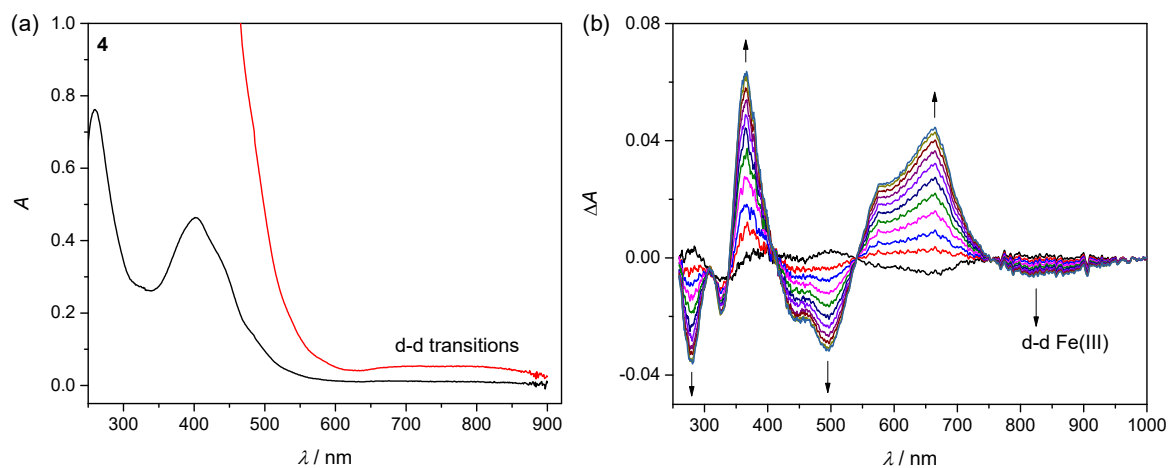




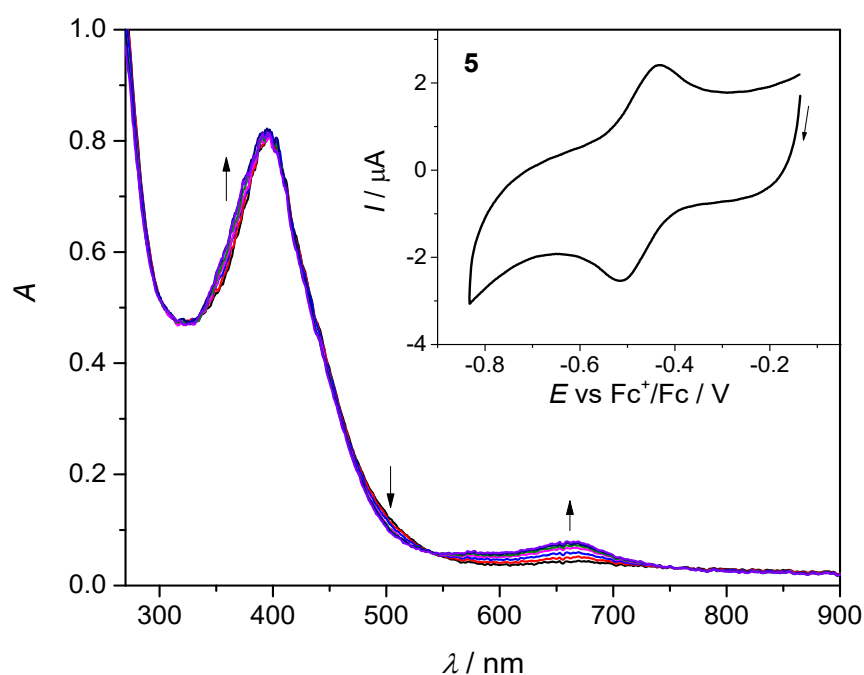
**Figure S19.** (a) Difference UV-vis-NIR spectra detected simultaneously during the *in situ* reduction of **3** in  $n\text{Bu}_4\text{NPF}_6/\text{DMSO}$  in the region of the first cathodic peak (forward scan). Inset: respective cyclic voltammogram (Pt-microstructured honeycomb working electrode, scan rate  $\nu = 10 \text{ mV s}^{-1}$ ). (b) Difference UV-vis-NIR spectra taken during cyclic voltammetric scan of **3** shown in 3D mode.



**Figure S20.** (a) UV-vis-NIR spectra detected simultaneously upon the *in situ* reduction of **1** in *n*Bu<sub>4</sub>NPF<sub>6</sub>/DMSO in the region of the first cathodic peak; inset: respective cyclic voltammogram (Pt-microstructured honeycomb working electrode, scan rate  $\nu = 10 \text{ mV s}^{-1}$ ); (b) Difference UV-vis-NIR spectra taken upon cyclic voltammetric scan of **1** shown in 3D mode.



**Figure S21.** (a) UV-vis-NIR spectra of **4** in DMSO; (b) Spectroelectrochemistry of **4** in  $n\text{Bu}_4\text{NPF}_6/\text{DMSO}$  in the region of the first cathodic peak - evolution of difference UV-vis-NIR spectra measured simultaneously upon forward scan (Pt-microstructured honeycomb working electrode, scan rate  $\nu = 10 \text{ mV s}^{-1}$ ).



**Figure S22.** UV-vis-NIR spectra measured simultaneously upon the *in situ* reduction of **5** in  $n\text{Bu}_4\text{NPF}_6/\text{DMSO}$  in the region of the first cathodic peak (forward scan); inset: respective cyclic voltammogram (Pt-microstructured honeycomb working electrode, scan rate  $\nu = 10 \text{ mV s}^{-1}$ ).

## 5. NCI-60 One-Dose Screen

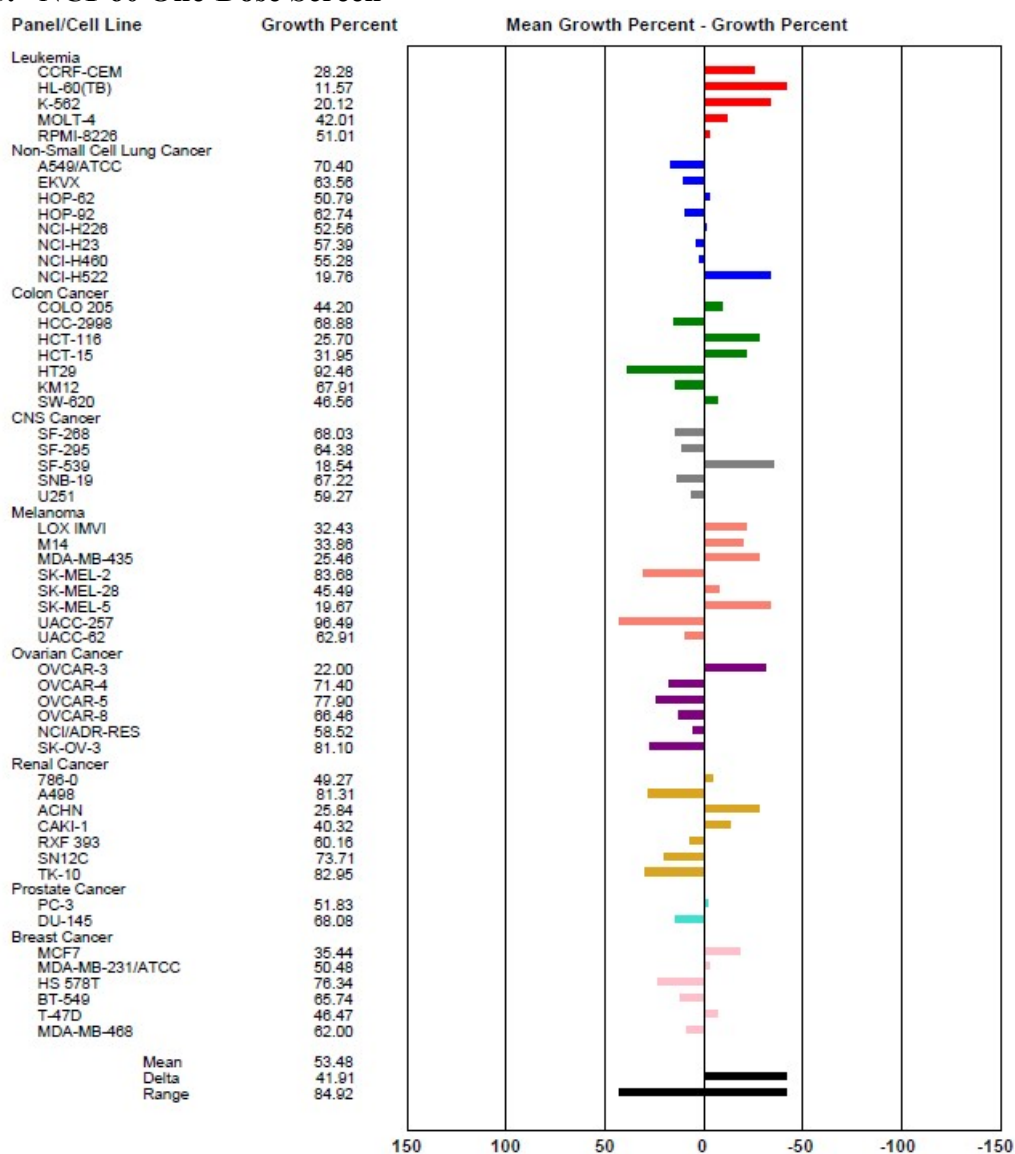


Figure S23. One dose mean graph for HL<sup>1</sup>.

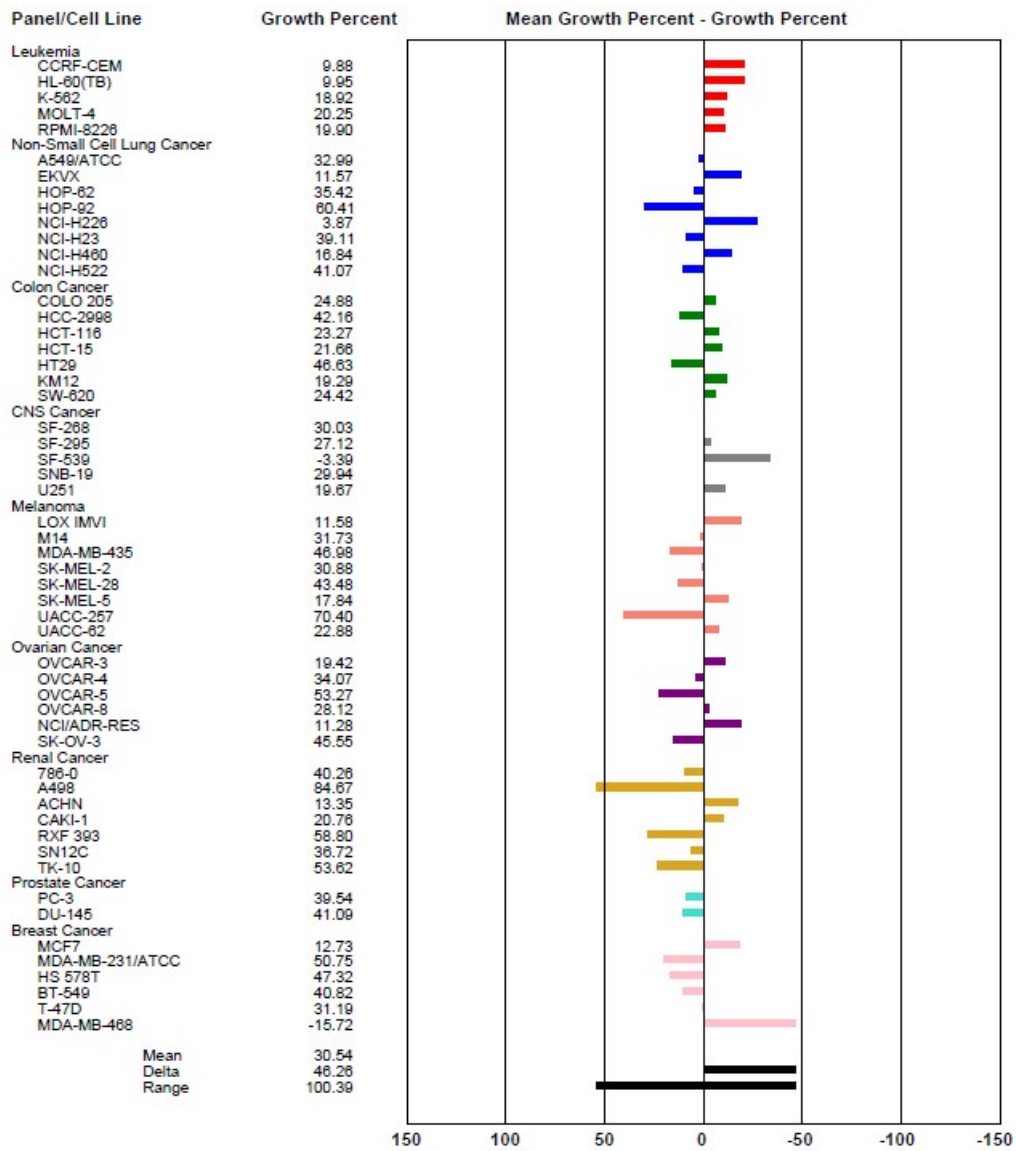


Figure S24. One dose mean graph for HL<sup>2</sup>.

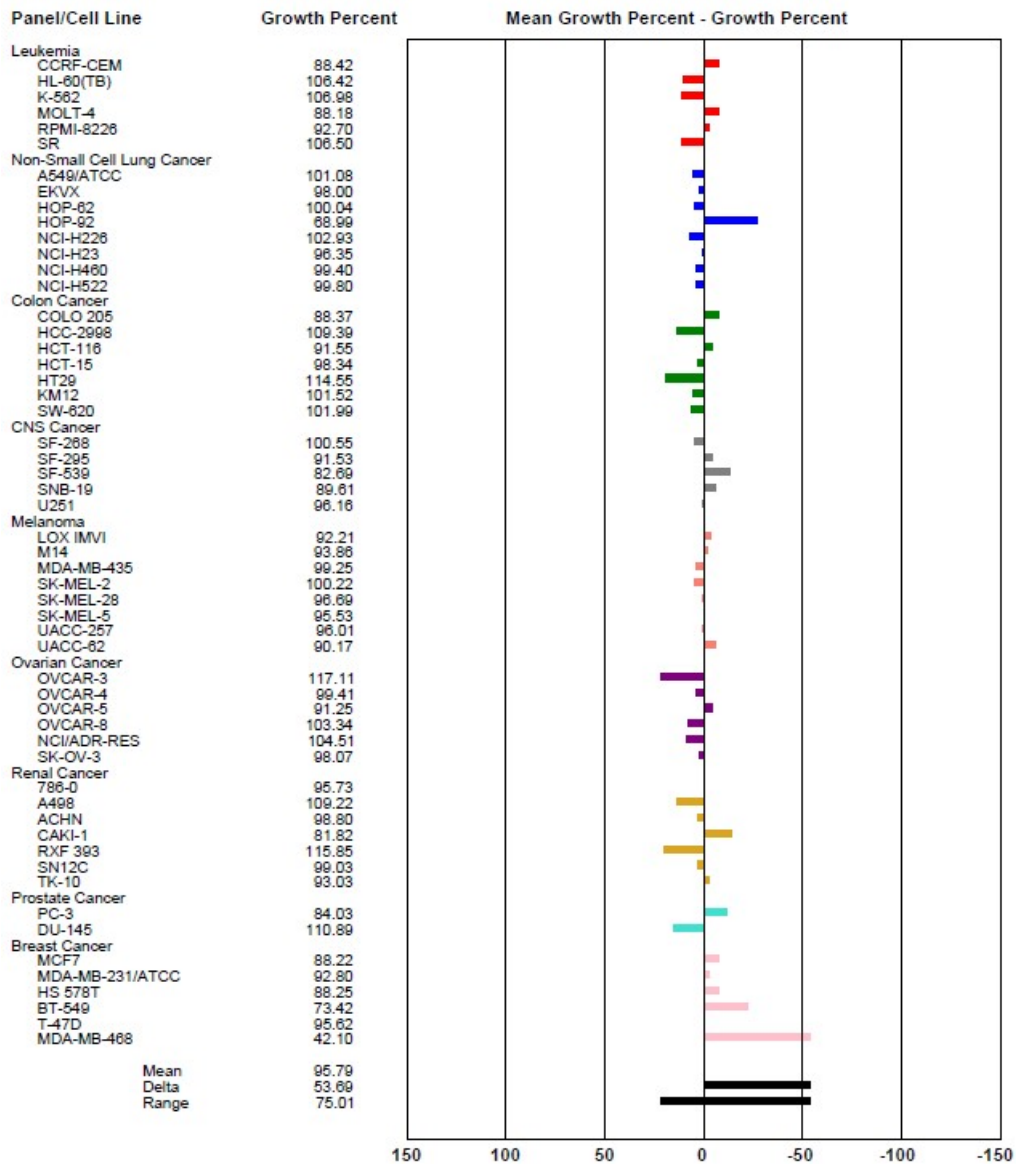


Figure S25. One dose mean graph for 3.

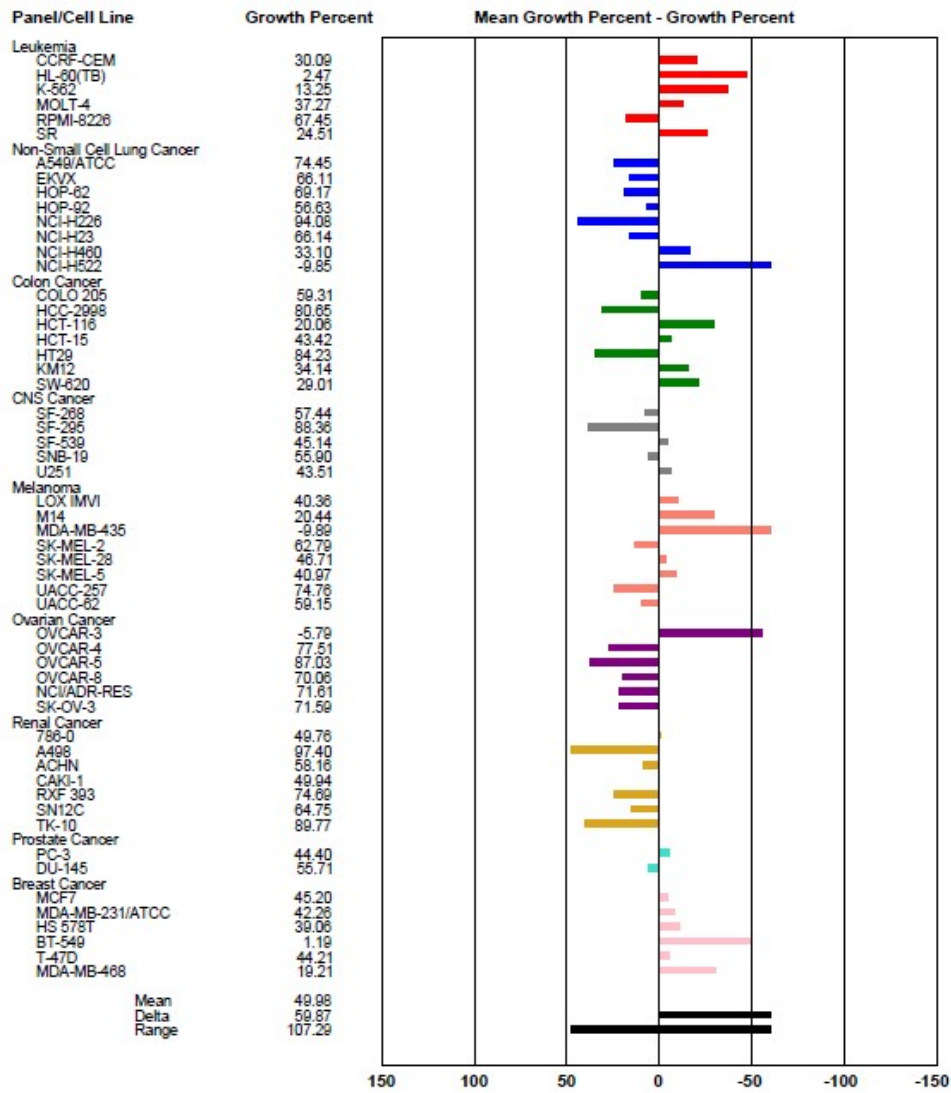


Figure S26. One dose mean graph for 6.

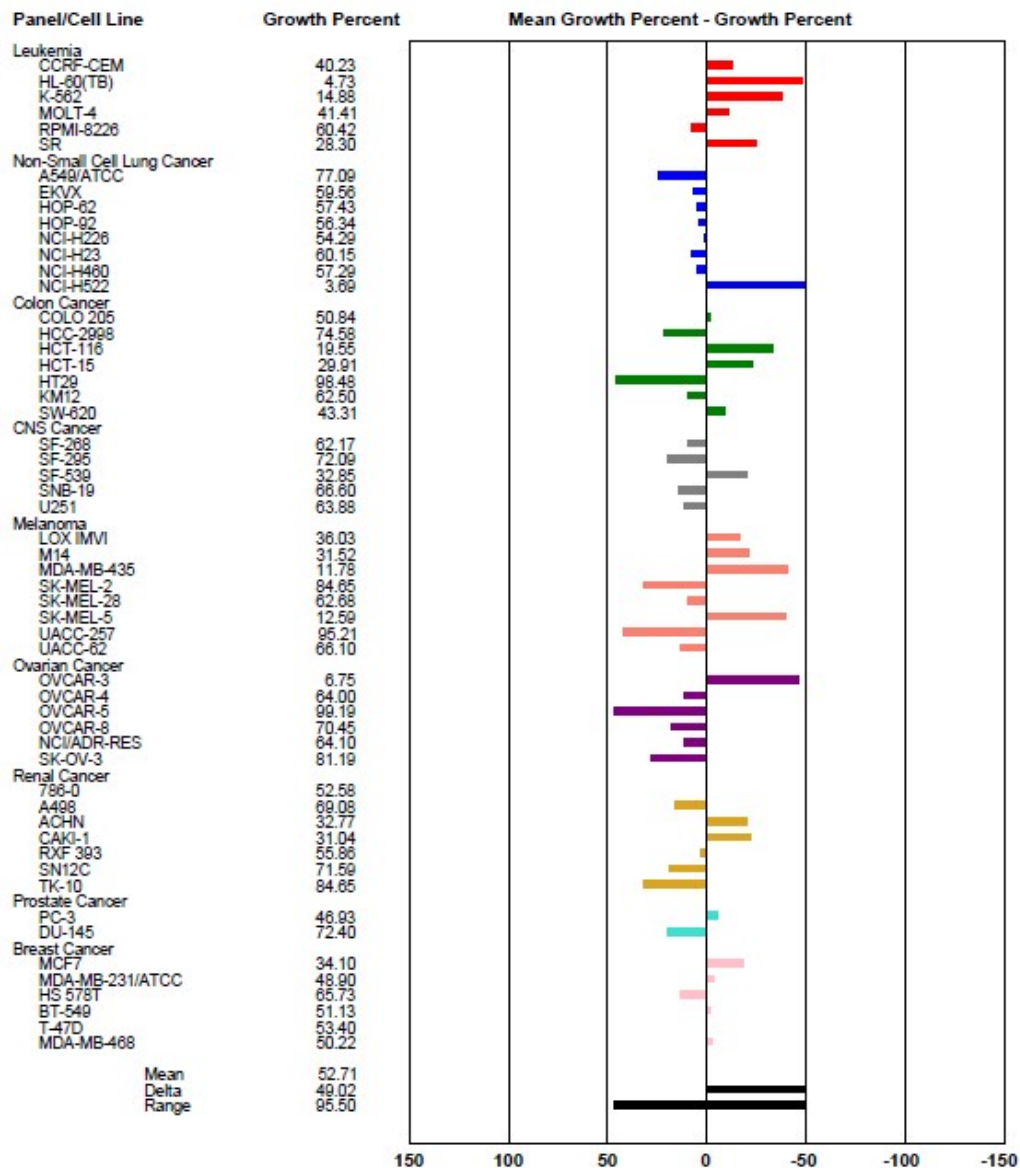


Figure S27. One dose mean graph for 7.



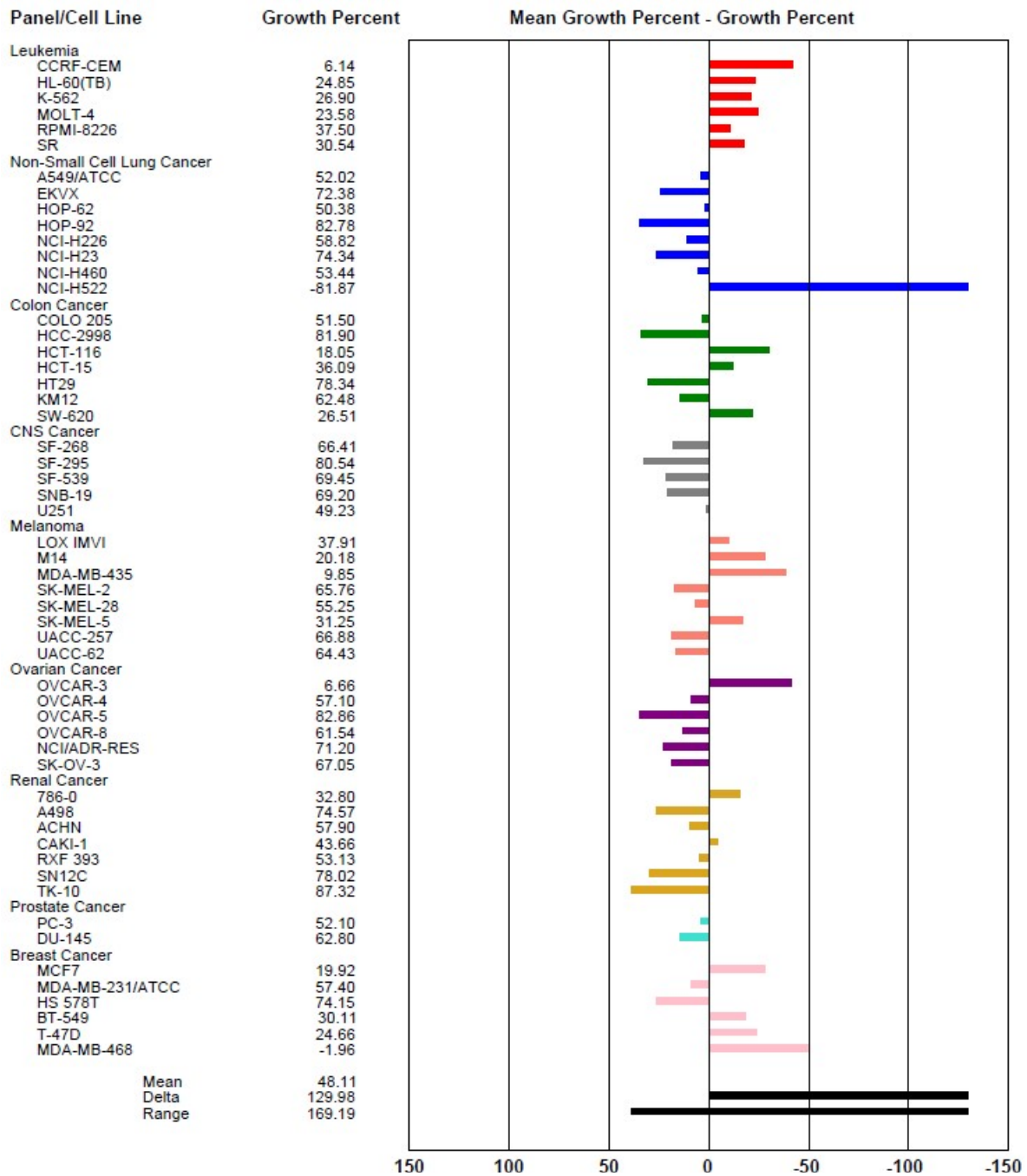
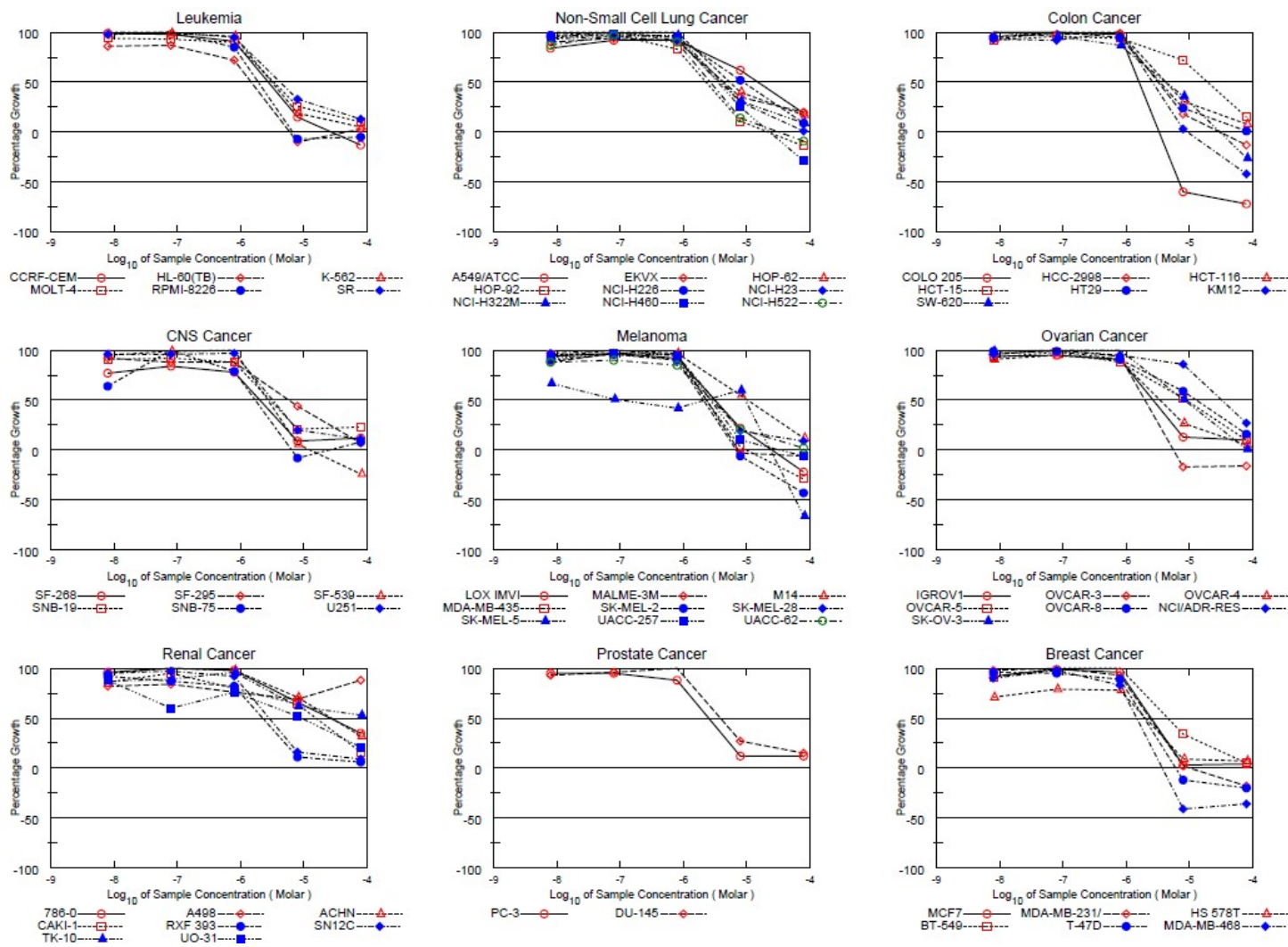


Figure S28. One dose mean graph for 8.

## 6. NCI-60 5-Dose Screen



Figure

S29.

Dose

response

S34

curves

for

1.

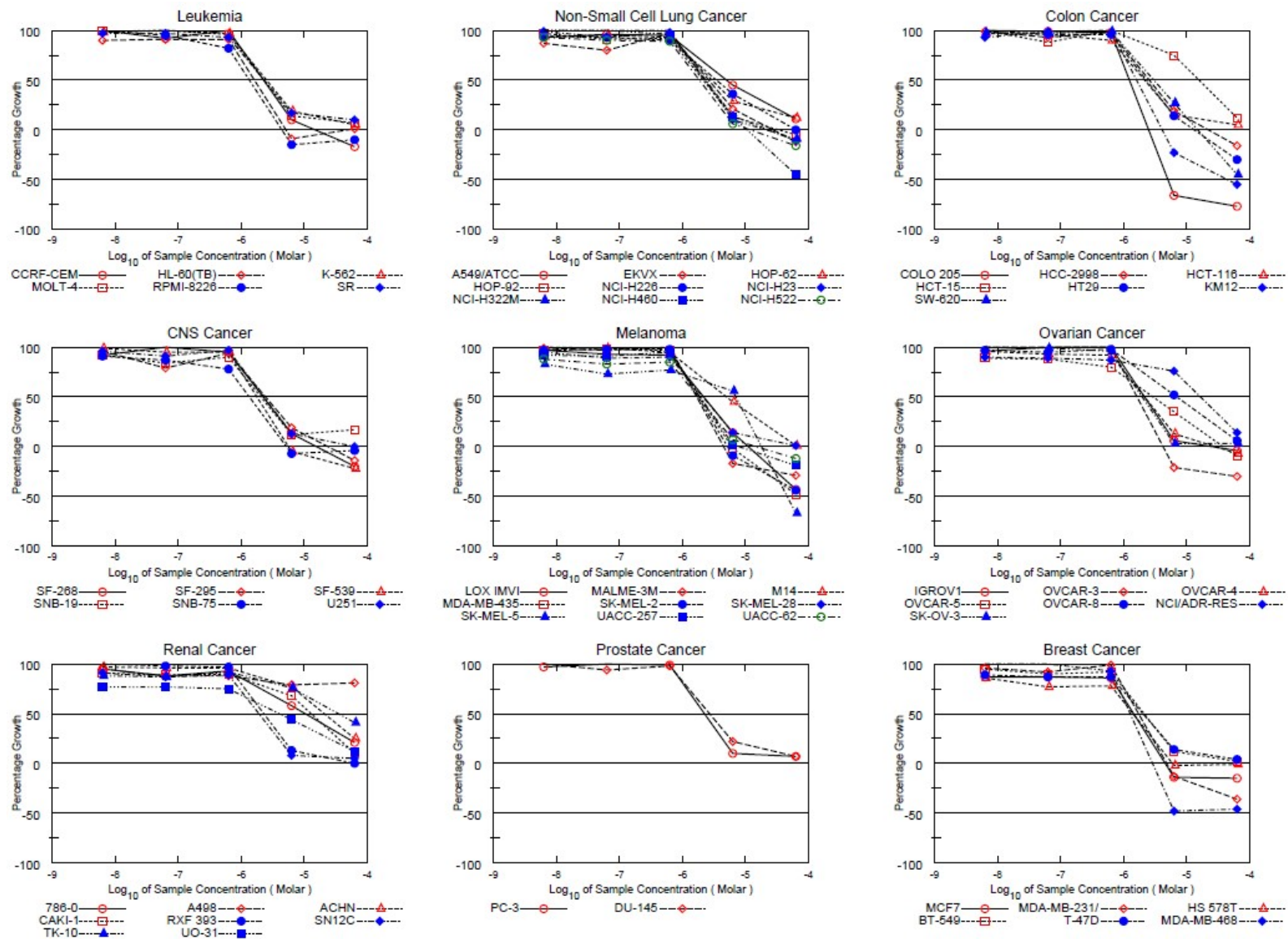


Figure S30. Dose response curves for 2.

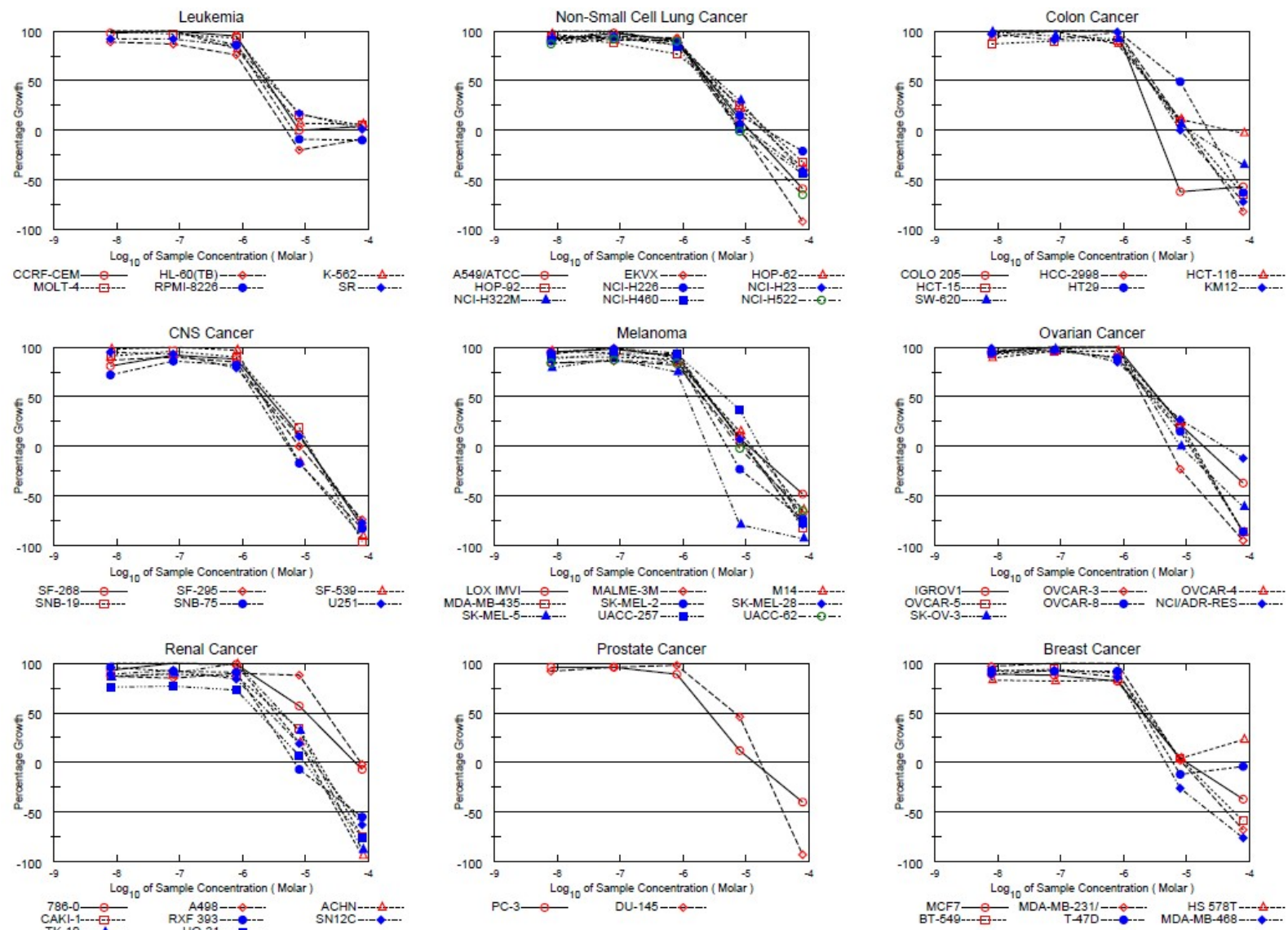
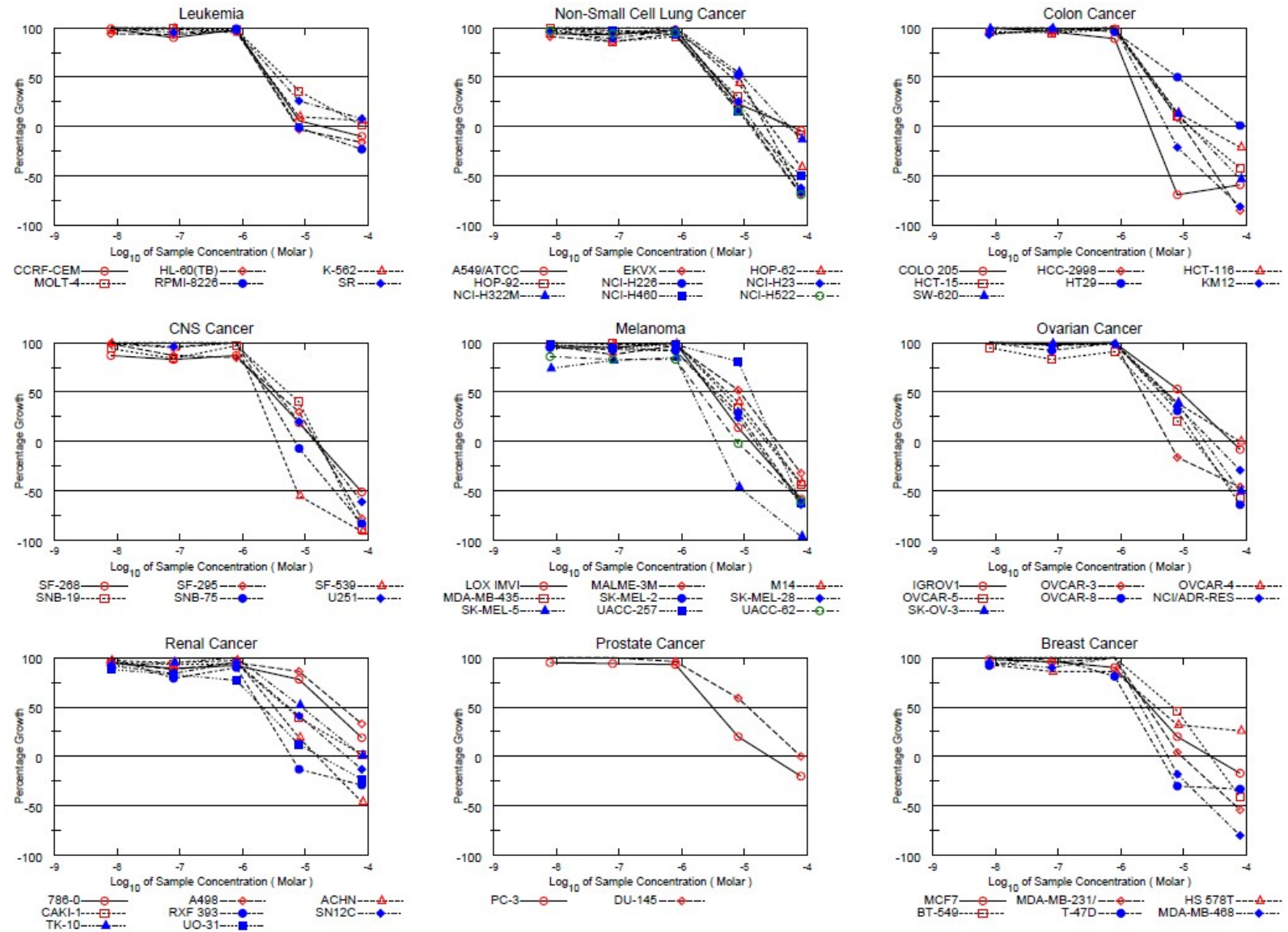


Figure S31. Dose response curves for 4.





Figure

S32.

Dose

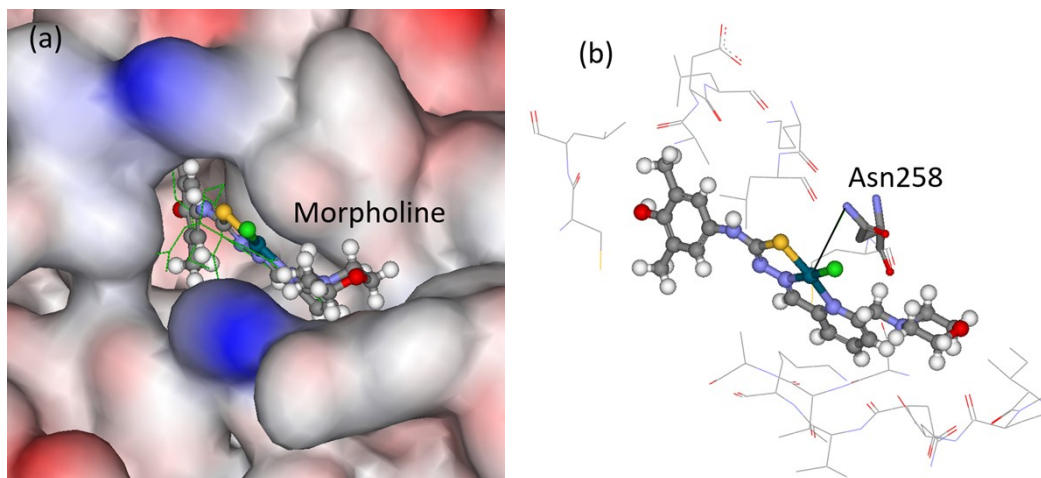
response

curves

for

5.

## 7. Molecular docking



**Figure S33.** (a) The docked pose of **8** (ball-and-stick) in the colchicine site of tubulin. The co-crystallized ligand (LOC) is shown in line format (green), its hydrogen atoms are not shown for clarity. The protein surface is rendered with blue color depicting regions with a partial positive charge on the surface, red color depicting regions with a partial negative charge and grey showing neutral areas. (b) The predicted binding of complex **8**, amino acids within 5 Å are shown in line format. Complex formation of the amide side chain of  $\beta$ Asn258 with the Pd(II) could occur as shown in this docking image (black solid line, 3.7 Å).