

Supplementary information

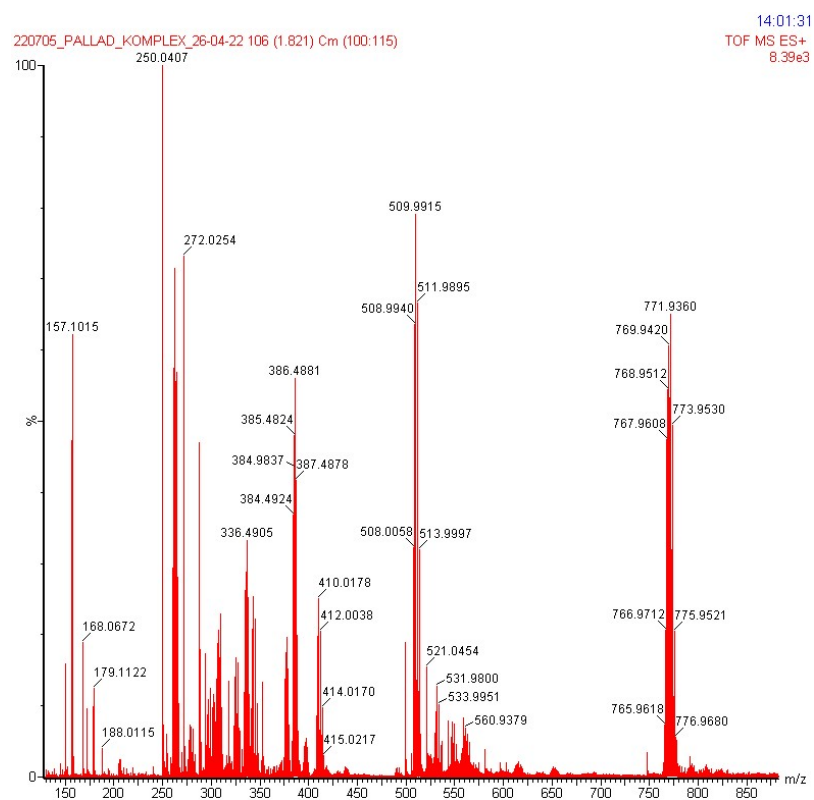


Figure 1S MS spectrum for $\text{Pd}_2(\text{bpy})_2\text{ale}$

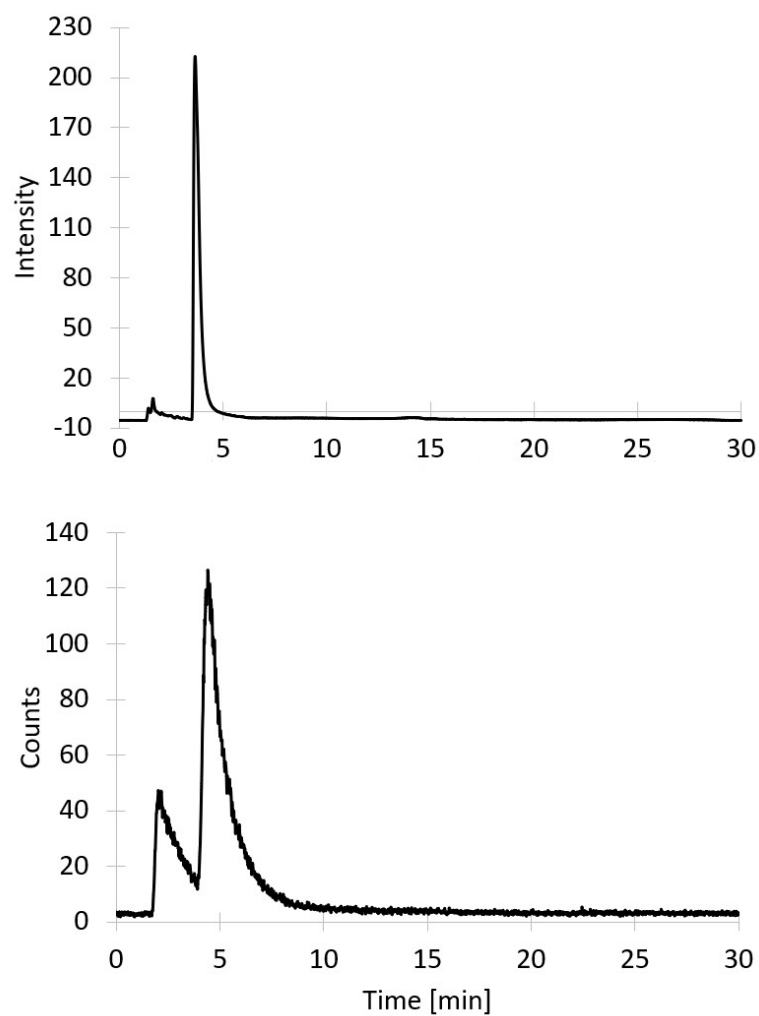


Figure 2S HPLC chromatogram for Pd₂(bpy)₂ale detected by UV detector at 300 nm, (up) and ¹⁰⁹Pd₂(bpy)₂ale detected by γ radiation detector (down)

Figure 3 Stability of ¹⁰⁹Pd₂(bpy)₂ale in human serum and PBS buffer

HS				SD
Time	%complex		Average %complex	
2	97,9	98,2	98,05	0,212132
4	98,1	98	98,05	0,070711
6	98	97,8	97,9	0,141421
24	96,7	95,5	96,1	0,848528

PBS				SD
Time	%complex		Average %complex	
2	94,8	94,8	94,8	0
4	93,9	96,4	95,15	1,767767
6	94,8	93,9	94,35	0,636396
24	94,7	94,8	94,75	0,070711

Fig 4 Retention Study of Rh^{3+} in $^{103}\text{Pd}_2(\text{bpy})_2\text{ale}$ complex

%complex			Average %complex	SD
84	85,4	83,6	84,33333333	0,945163
84,3	83,8	80,2	82,76666667	2,236813
85,2	84,8	81,3	83,76666667	2,145538
83,4	83,2	80,2	82,26666667	1,792577
83,2	83,3	78,1	81,53333333	2,973774
82,7	83	80	81,9	1,652271
81,2	80,8	76,7	79,56666667	2,490649
84,2	82,9	78,2	81,76666667	3,156475
85,6	83,9	78,6	82,7	3,651027

Figure 5 Radioactivity of AgCl precipitated from the $^{109}\text{Pd}_2(\text{bpy})_2\text{ale}$ complex solution. The measurement started 133 s after the addition of AgNO_3 . The radioactivity of the AgCl was measured successively at 15-second intervals. Activity in cpm.

Measurement time	cpm	ln A
85	327894	12,70045
100	219363	12,29848
115	143838	11,87644
130	87199	11,37595
145	65650	11,09209
160	44567	10,70475
175	32360	10,38468
190	26902	10,19996
205	18815	9,84241
220	11954	9,388821
235	7645	8,941807
250	5779	8,661986

Figure 6 Adsorption of $^{109}\text{Pd}_2(\text{bpy})_2\text{ale}$ on HA grains

Pd2(bpy)2ale						
Mass of Sorbent (mg)	Activity after 12hr		Total Activity	Blank Activity	% Sorption	SD
50	337,2	342,2	679,5	2449	72,25398122	3,535534
75	264	272,7	536,7		78,08493263	6,151829
100	219	217	436		82,19681503	1,414214

Figure 7 Adsorption kinetics of $^{109}\text{Pd}_2(\text{bpy})_2\text{ale}$ on HA grains

Pd2(bpy2)ale							
Time Interval	Activity of sample		Average activity	Blank Activity		Average Blank Activity	% Sorption
0							0
2	22210	22030	22120	31280	31250	31265	29,24996
4	13320	13270	13295	27740	27600	27670	51,951572
6	8709	8696	8702,5	24890	24750	24820	64,93755
10	2061	2037	2049	12140	12160	12150	83,135802
24	1447	1432	1439,5	9488	9476	9482	84,818604
48	283,3	283,64	283,47	2929	2926	2927,5	90,316994
72	82,06	81,85	81,955	899,7	908,2	903,95	90,93368

Figure 8 Metabolic viability of SKOV-3 cells after treatment with different concentrations of $\text{Pd}_2(\text{bpy})_2\text{ale}$ non-radioactive conjugates

Pd2(bpy)2ale- SKOV 3					
Concentration	70 µg/ml	50 µg/ml	30 µg/ml	Control	Background
24hr	0,976	1,075	1,156	1,219	0,135
	1,071	1,093	1,142	1,179	0,13
	0,946	1,02	1,112	1,131	0,128
average	0,997667	1,062667	1,136667	1,176333	0,131
SD	0,065256	0,038031	0,02248		
%MAC	82,90816	89,12628	96,20536		
48hr	0,868	0,905	1,029	1,638	0,129
	0,868	0,848	1,19	1,543	0,127
	0,896	0,88	1,296	1,539	0,124
average	0,877333	0,877667	1,171667	1,573333	0,12666667
SD	0,016166	0,028572	0,134441		
%MAC	51,8894	51,91244	72,23502		
72hr	0,441	0,478	0,634	2,13	0,133
	0,402	0,449	0,697	2,117	0,131
	0,43	0,482	0,715	2,116	0,133
average	0,424333	0,469667	0,682	2,121	0,13233333
SD	0,020108	0,018009	0,042532		
%MAC	14,6832	16,96279	27,63996		

	30	50	70
24h	96,20536	89,12628	82,90816
48h	72,23502	51,91244	51,8894
72h	27,63996	16,96279	14,6832

Figure 9 Metabolic viability of SKOV-3 cells after treatment with different concentrations of $^{103}\text{Pd}_2(\text{bpy})_2\text{ale}$ (up) and $^{109}\text{Pd}_2(\text{bpy})_2\text{ale}$ complexes (down)

103Pd2(bpy)2ale- SKOV 3						
Concentration	50 MBq/ml	25 MBq/ml	12MBq/ml	6MBq/ml	Control	Background

24hr	0,697	0,549	1,294	1,723	1,724	0,137
	0,447	0,536	1,31	1,672	1,649	0,135
	0,497	0,556	1,194	1,675	1,745	0,134
average	0,547	0,547	1,266	1,69	1,706	0,135333333
SD	0,132287566	0,010148892	0,062864935	0,028618		
%MAC	26,20967742	26,20967742	71,98641766	98,98132		
48hr	0,165	0,292	0,759	1,084	2,37	0,138
	0,165	0,231	0,784	0,848	2,293	0,135
	0,192	0,227	0,646	0,677	2,247	0,134
average	0,174	0,25	0,729666667	0,869667	2,303333	0,135666667
SD	0,015588457	0,036428011	0,073527773	0,204363		
%MAC	1,768414578	5,274488698	27,4027372	33,86129		
72hr	0,186	0,201	0,381	0,535	2,844	0,136
	0,197	0,204	0,349	0,754	2,97	0,137
	0,189	0,178	0,412	0,722	2,703	0,138
average	0,190666667	0,194333333	0,380666667	0,670333	2,839	0,137
SD	0,005686241	0,014224392	0,031501323	0,118289		
%MAC	1,986183074	2,121885023	9,01801135	19,73847		

	6	12	25	50
24h	98,98132428	71,98641766	26,20968	26,20968
48h	33,86129479	27,4027372	5,274489	1,768415
72h	19,73846533	9,01801135	2,121885	1,986183

109Pd2(bpy)2ale- SKOV 3						
Concentration	50 MBq/ml	25 MBq/ml	12MBq/ml	6MBq/ml	Control	Background
24hr	0,255	0,307	0,472	1,067	1,029	0,134
	0,279	0,299	0,375	1,015	0,899	0,136
	0,3	0,284	0,394	1,093	1,033	0,138
average	0,278	0,296666667	0,413666667	1,058333	0,987	0,136
SD	0,02251666	0,011676187	0,051403632	0,039716		
%MAC	16,68625147	18,87974931	32,62828045	108,3823		
48hr	0,348	0,3	0,32	1,293	1,343	0,138
	0,387	0,45	0,369	1,033	1,569	0,143
	0,353	0,441	0,4	0,755	1,829	0,149
average	0,362666667	0,397	0,363	1,027	1,580333	0,143333333
SD	0,021221059	0,084124907	0,040336088	0,26905		
%MAC	15,26327998	17,65251682	15,28647646	61,49385		
72hr	0,443	0,506	0,273	0,664	2,623	0,133
	0,39	0,441	0,3	0,55	2,937	0,132
	0,493	0,446	0,298	0,531	2,869	0,136
average	0,442	0,464333333	0,290333333	0,581667	2,809667	0,133666667
SD	0,051507281	0,036170891	0,015044379	0,071933		

%MAC	11,5221724	12,35675137	5,854509218	16,74141		
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	6	12	25	50
24h	108,3822953	32,62828045	18,87975	16,68625
48h	61,49385293	15,28647646	17,65252	15,26328
72h	16,74140508	5,854509218	12,35675	11,52217

Figure 10 Metabolic viability of DU-145 cells after treatment with different concentrations of $^{103}\text{Pd}_2(\text{bpy})_2\text{ale}$ (up) and $^{109}\text{Pd}_2(\text{bpy})_2\text{ale}$ complexes (down)

103Pd2(bpy)2ale- DU145						
Concentration	50 MBq/ml	25 MBq/ml	12MBq/ml	6MBq/ml	Control	Background
24hr	0,324	0,64	1,06	1,15	1,32	0,103
	0,328	0,674	1,166	1,207	1,467	0,105
	0,392	0,772	1,133	1,188	1,635	0,107
average	0,348	0,695333333	1,119666667	1,181667	1,474	0,105
SD	0,038157568	0,068537095	0,054243279	0,029023		
%MAC	17,75018262	43,12149988	74,1173606	78,64621		
48hr	0,131	0,417	1,039	1,214	1,796	0,109
	0,293	0,366	0,956	1,348	1,816	0,106
	0,147	0,433	0,928	1,242	1,867	0,106
average	0,190333333	0,405333333	0,974333333	1,268	1,826333	0,107
SD	0,089271123	0,034990475	0,057726366	0,070682		
%MAC	4,84683986	17,3516867	50,44590927	67,52617		
72hr	0,126	0,173	0,873	1,146	2,77	0,103
	0,184	0,268	0,764	1,147	2,67	0,106
	0,13	0,298	0,805	1,083	2,865	0,106
average	0,146666667	0,246333333	0,814	1,125333	2,768333	0,105
SD	0,032393415	0,065255907	0,055054518	0,036665		
%MAC	1,564455569	5,306633292	26,62077597	38,31039		

	6	12	25	50
24h	78,64621378	74,1173606	43,1215	17,75018
48h	67,52617294	50,44590927	17,35169	4,84684
72h	38,31038798	26,62077597	5,306633	1,564456

109Pd2(bpy)2ale- DU145						
Concentration	50 MBq/ml	25 MBq/ml	12MBq/ml	6MBq/ml	Control	Background
24hr	0,282	0,879	0,986	1,135	1,264	0,111

	0,345	0,542	1,049	1,168	1,347	0,111
	0,361	0,983	0,958	1,161	1,332	0,118
average	0,329333333	0,801333333	0,997666667	1,154666667	1,314333	0,113333333
SD	0,041765217	0,230530548	0,046608297	0,017387735		
%MAC	17,98501249	57,28559534	73,63308354	86,70552318		
48hr	0,179	0,878	0,741	1,398	1,879	0,104
	0,19	0,766	0,897	1,35	2,327	0,103
	0,198	0,837	0,852	1,559	2,713	0,105
average	0,189	0,827	0,83	1,435666667	2,306333	0,104
SD	0,009539392	0,056665686	0,080293213	0,10947298		
%MAC	3,859542909	32,82881792	32,96503708	60,46617224		
72hr	0,18	0,221	0,269	0,852	2,557	0,105
	0,168	0,201	0,372	0,72	2,318	0,109
	0,168	0,207	0,35	0,739	2,33	0,094
average	0,172	0,209666667	0,330333333	0,770333333	2,401667	0,102666667
SD	0,006928203	0,010263203	0,054243279	0,071360587		
%MAC	3,015803973	4,654197477	9,902856314	29,0416123		

	6	12	25	50
24h	86,70552318	73,63308354	57,28559534	17,98501
48h	60,46617224	32,96503708	32,82881792	3,859543
72h	29,0416123	9,902856314	4,654197477	3,015804

Figure 11 Microscopic images of Nuclei (Blue), γ H2AX foci (red) and merging of both Nuclei and γ H2AX for the treated DU145 cells with $^{109}\text{Pd}_2(\text{bpy})_2\text{ale}$ after 4h and 24h of incubation

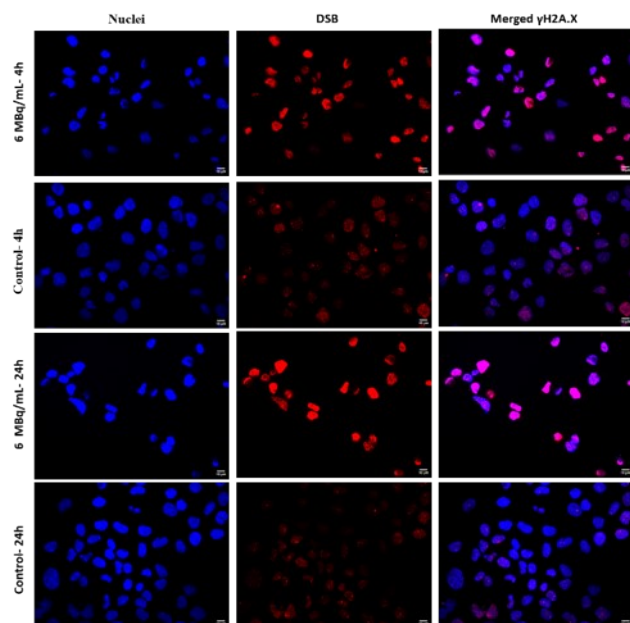


Figure 12 Analysis of γ H2AX foci per cell with different time and concentration

Concentration	Particle Number		Integ. Density		InDen/PN	Mean	SD
6	84		132741,72		1580,258571	2013,375	423,2122
	113		176716,26		1563,860708		
	99		230136,75		2324,613636		
	114		300821,94		2638,788947		
	85		176542,38		2076,969176		
	118		223699,5		1895,758475		

Concentration	Particle Number		Integ. Density		InDen/PN	Mean	SD
25	28		128627,28		4593,831429	3976,516	567,8088
	28		112778,01		4027,786071		
	33		101050,02		3062,121818		
	34		144164,07		4240,119706		
	27		106885,53		3958,723333		

Control 4 h	PN	In Den	In Den/PN	Mean	SD
	268	426056,04	1589,761343	1322,69337	286,0412
	312	431729,55	1383,748558		
	360	363933,9	1010,9275		
	365	378221,13	1036,222274		
	295	469878,12	1592,807186		

4 h	Concen.	Mean Den/PN	SD	DENS/Control	SD/Control	
	Control	1322,693372	286,04115	1	1	
	6	2013,374919	423,212216	1,522178126	1,479550113	
	25	3976,516471	567,808764	3,006378164	1,985059715	

Concentration	Particle Number		Integ. Density		InDen/PN	Mean	SD
6	63		172574,1		2739,271429	3811,14	3061,083
	169		192113,46		1136,766036		
	44		407147,4		9253,35		

	334	365120,28	1093,174491		
	73	367718,22	5037,23589		
	102	367918,11	3607,040294		

Concentration	Particle Number		Integ. Density		InDen/PN	Mean	SD
25	3		27859,5		9286,5	5150,074	2571,255
	8		30560,31		3820,03875		
	11		28867,23		2624,293636		
	5		28836,09		5767,218		
	4		17009,28		4252,32		

Control 24 h	PN	In Den	In Den/PN	Mean	SD
	142	389077,3	2739,981	2177,04	1107,111
	214	389532,3	1820,245		
	308	358273,4	1163,225		
	116	443907,2	3826,786		
	394	525975,9	1334,964		

24 h	Concen.	Mean Den/PN	SD	DENS/Control	SD/Control	
	Control	2177,040245	1107,111	1	1	
	6	3811,13969	3061,083	2,881347839	10,70154613	
	25	5150,074077	2571,255	3,893626584	8,989108747	

Mean	Control	6 MBq/ mL	25 MBq/ mL
4 h	1	1,52	3,01

24 h	1,0	2,88134784	3,89
SD	Control	6 MBq/ mL	25 MBq/ mL
4 h	1	1,47955011	1,985059715
24 h	1	10,7015461	8,989108747