

A phenolic-rich extract *from Ugni molinae* berries reduces abnormal protein aggregation in a cellular model of Huntington's disease

Rodrigo Pérez-Arancibia^{1,2,3,4}, Jose Luis Ordoñez^{1,5}, Alexis Rivas^{2,3,4}, Philippe Pihán^{2,3,4}, Alfredo Sagredo^{2,3,4}, Ulises Ahumada⁶, Andrés Barriga⁷, Ivette Seguel¹, Cesar Cardenas⁶, Rene L. Vidal^{2,3,6}, Claudio Hetz^{2,3,4,8,*}, Carla Delporte^{1,*}

¹Laboratorio de Productos Naturales, Departamento de Química Farmacológica y Toxicológica, Facultad de Ciencias Químicas y Farmacéuticas, Universidad de Chile, PO Box 8380492, Santos Dumont 964, Santiago, Chile.

²Instituto de Neurociencia Biomédica (BNI), Facultad de Medicina, Universidad de Chile, Santiago, Chile.

³Centro FONDAP de Gerociencia, Salud Mental y Metabolismo (GERO), Santiago, Chile.

⁴Programa de Biología Celular y Molecular, Instituto de Ciencias Biomédicas, Universidad de Chile, Santiago, Chile.

⁵Laboratorio de Química Inorgánica y Analítica, Departamento de Química inorgánica y Analítica, Facultad de Ciencias Químicas y Farmacéuticas, Universidad de Chile, Santiago, Chile.

⁶Centro de Biología Integrativa, Facultad de Ciencias, Universidad Mayor, Chile.

⁷Unidad de Espectrometría de Masas, Facultad de Ciencias Químicas y Farmacéuticas, Universidad de Chile, Santiago, Chile.

⁸Buck Institute for Research on Aging, Novato, California, USA.

* Corresponding authors:

Email: chetz@uchile.cl, chetz@buckinstitute.org (CH); cdelpor@uchile.cl (CD)

Raw data Figure 3A – PolyQ₇₉ high molecular weight species (HMWS) and monomers

Image aquaried by using the ChemiDoc platform (Biorad)

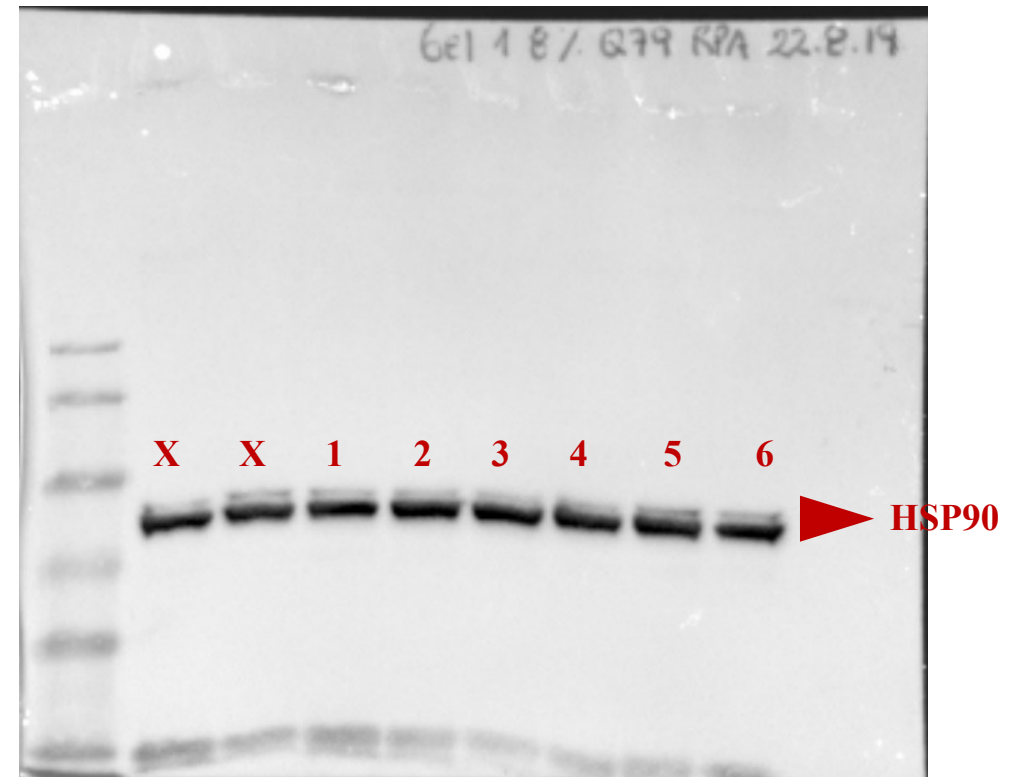


PolyQ₇₉ HMWS

Treatments:

1. DMSO
2. ETE 14-4
3. ETE 19-1
4. ETE 19-1ha
5. ETE 23-2
6. ETE 27-1

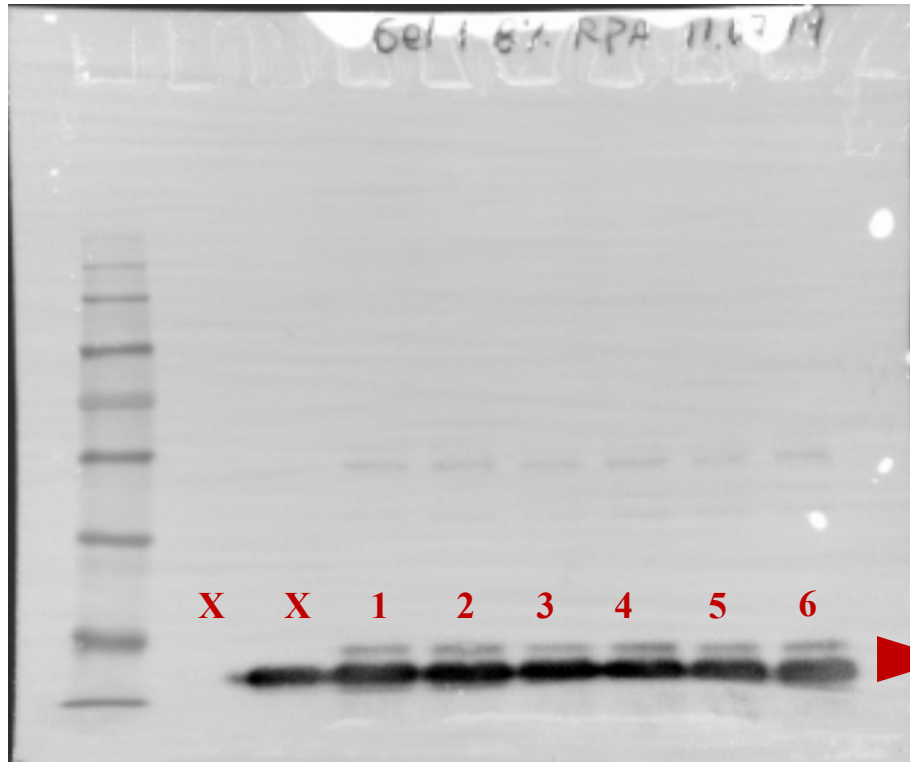
PolyQ₇₉ monomer



HSP90

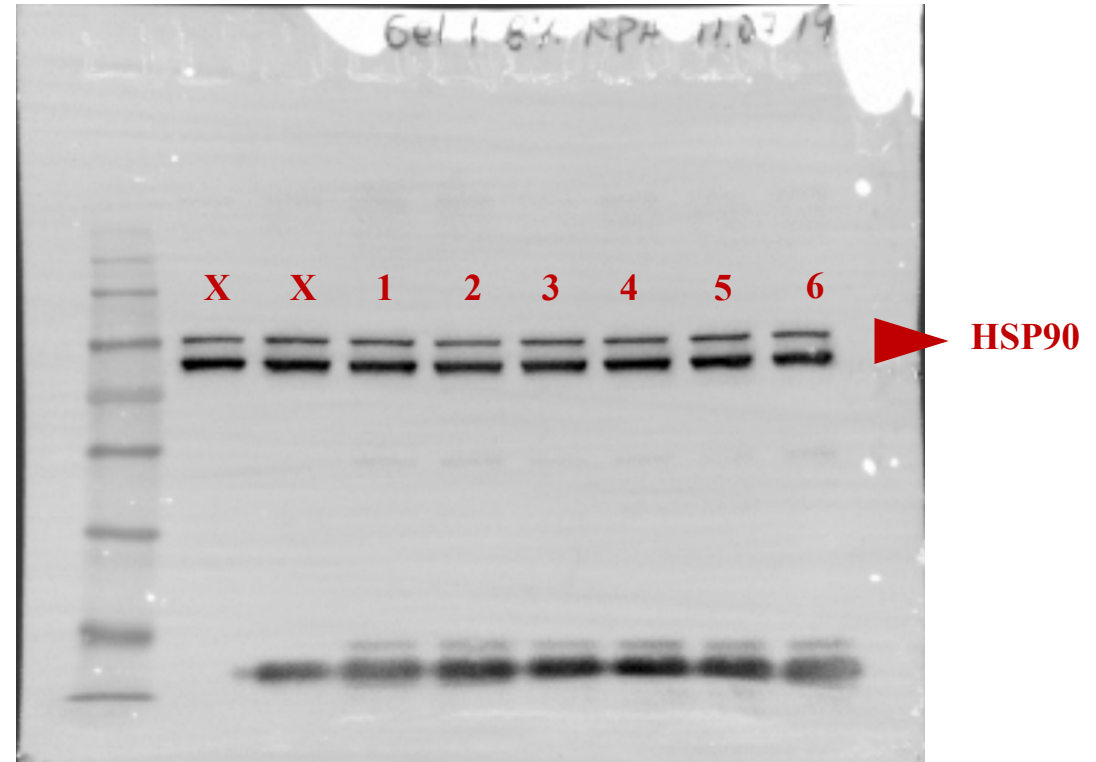
Raw data Figure 3D – PolyQ₁₁ monomers

Images aquaried by using the ChemiDoc platform (Biorad)

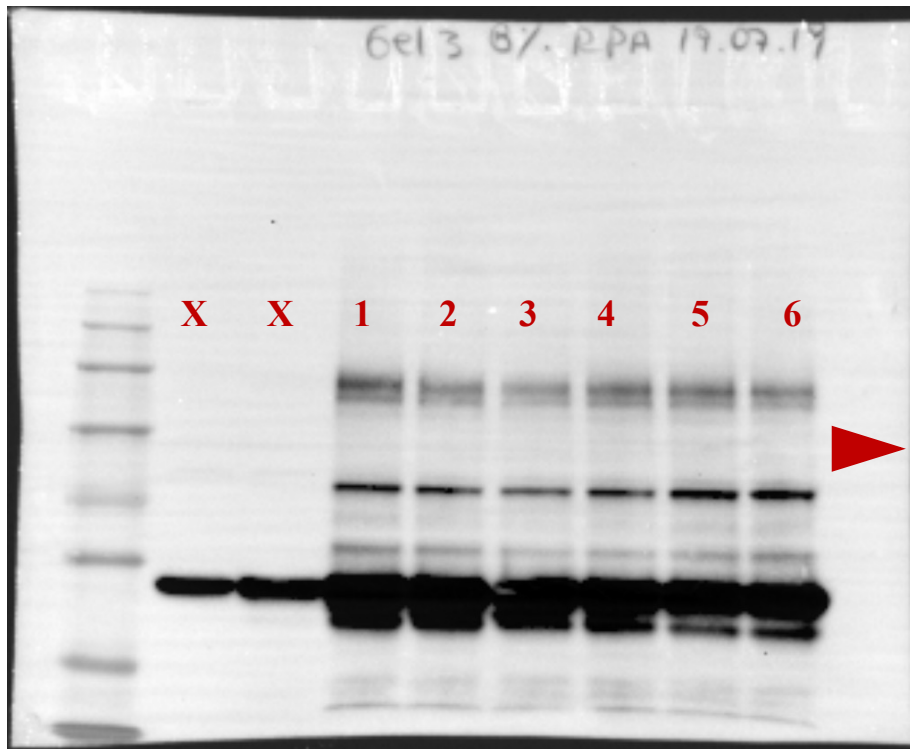


Treatments:

1. DMSO
2. ETE 14-4
3. ETE 19-1
4. ETE 19-1ha
5. ETE 23-2
6. ETE 27-1



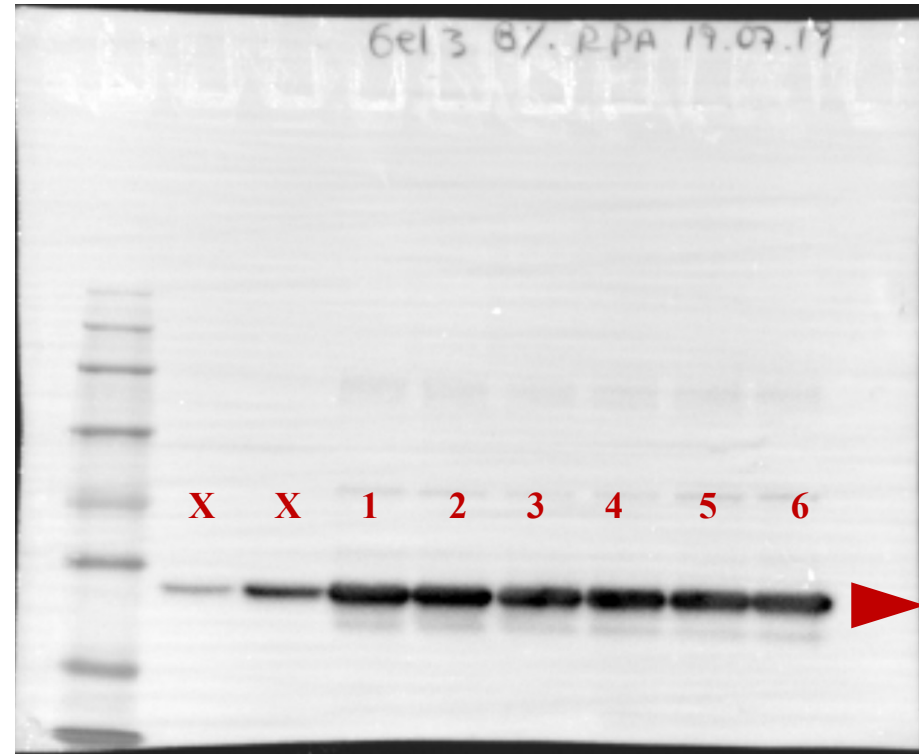
Raw data Figure 4A – mHTT high molecular weight species (HMWS) and monomers
Images aquaried by using the ChemiDoc platform (Biorad)



mHTT HMWS

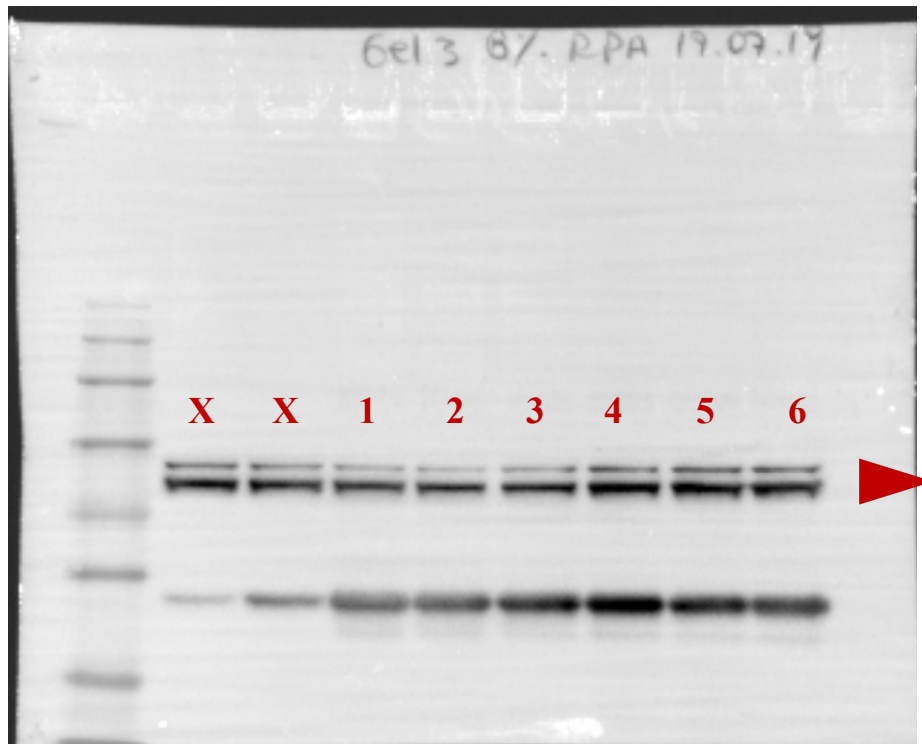
Treatments:

1. DMSO
2. ETE 14-4
3. ETE 19-1
4. ETE 19-1ha
5. ETE 23-2
6. ETE 27-1



mHTT monomer

6el3 8/. RPA 19.07.17

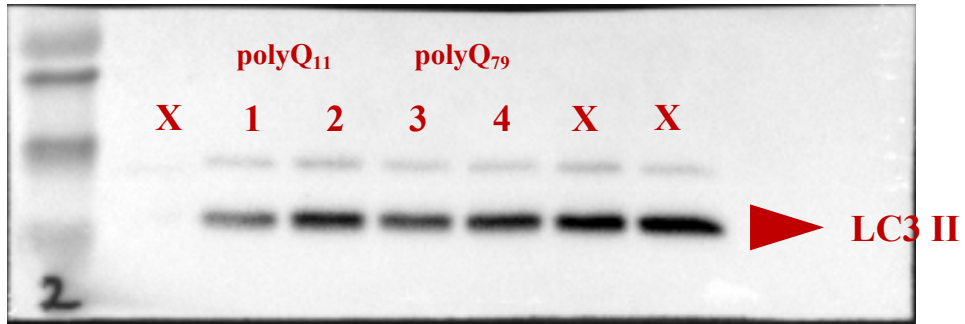
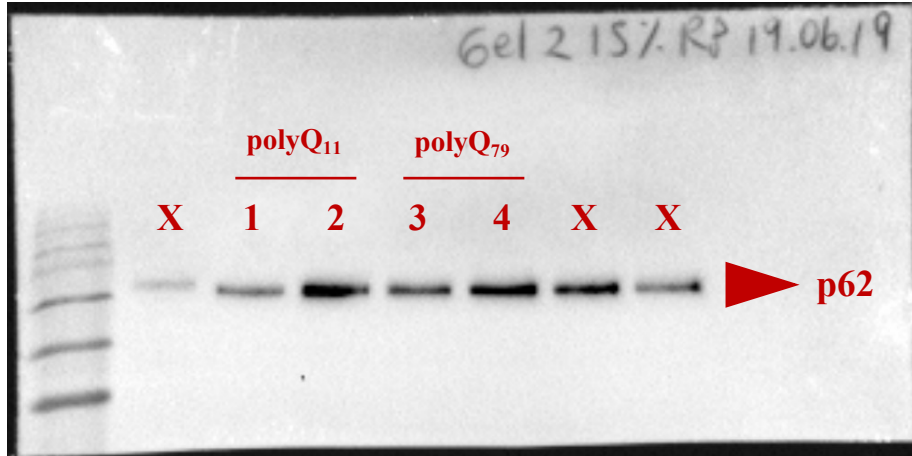


X X 1 2 3 4 5 6

HSP90

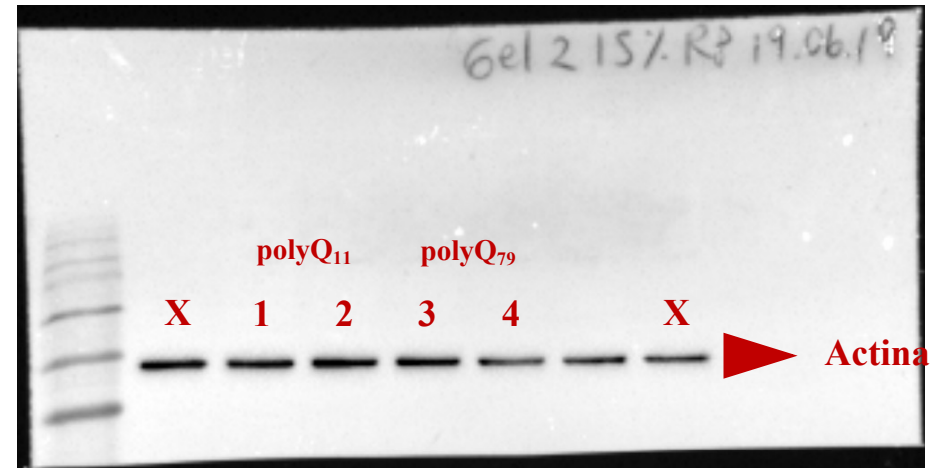
Raw data Figure 5A – p62 and LC3II

Images aquaried by using the ChemiDoc platform (Biorad)



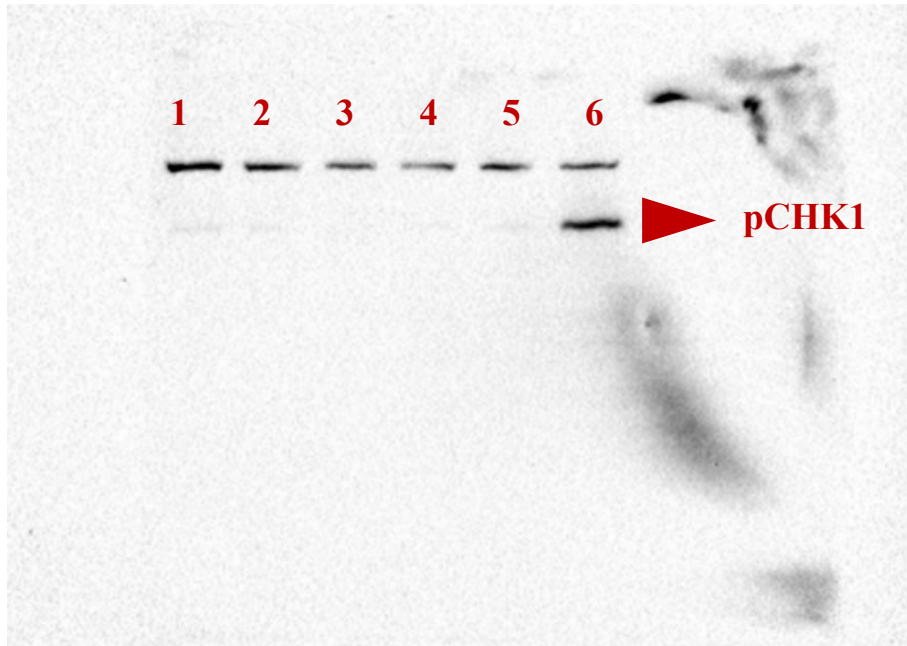
Treatments:

1. DMSO
2. ETE 19-1
3. DMSO
4. ETE 19-1



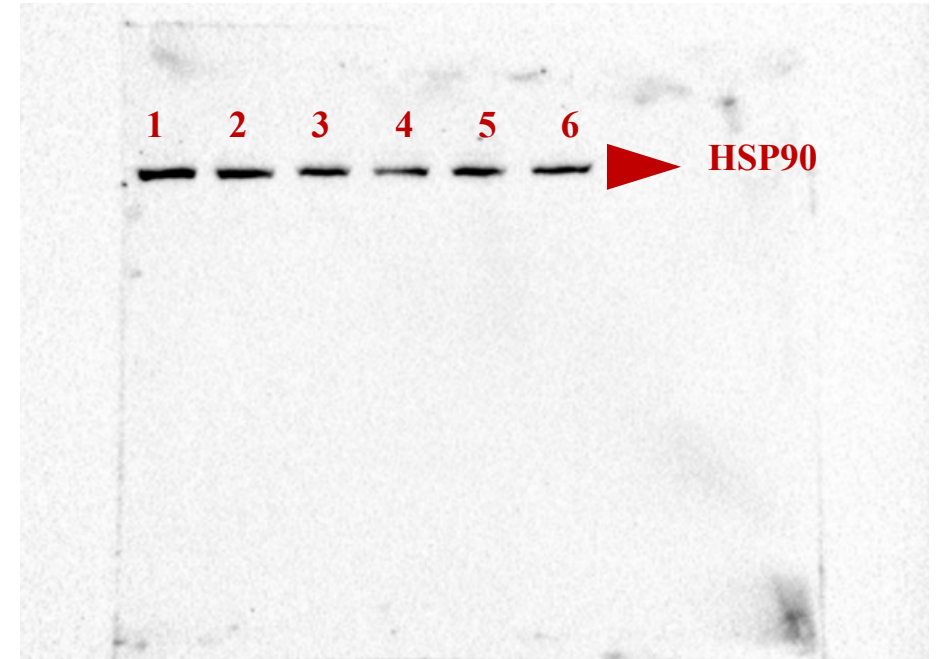
Raw data Figure S3A – pCHK1

Images aquaried by using the ChemiDoc platform (Biorad)



Treatments:

1. Not treated
2. DMSO
3. ETE 19-1 [100 μ g/mL]
4. ETE 19-1 [200 μ g/mL]
5. Quercetin [10 μ M]
6. Etoposide [25 μ M]



CFT ETEs

	14-4	19-1	19-1 ha	19-2	22-1	23-2	27-1	31-1
n=1	18.9	28.16	26.42	32.3	28.44	31.07	23.91	29.52
n=2	21.4	28.56	26.46	34.23	30.96	27.6	23.36	25.98
n=3	20.6	26.02	26.25	31.02	25.1	31.18	23.08	26.59

CFT ACEs

	14-4	19-1	19-1 ha	19-2	22-1	23-2	27-1	31-1
n=1	88	111.1	95.68	86.5	99.64	94.51	70.94	87.76
n=2	100	104.6	95.95	86.19	115.2	93.86	68.89	84.38
n=3	97.4	90.91	88.67	101.5	108.2	93.46	67.22	88.82

RT (min)	[M-H] ⁻ (m/z)	Tentative Identification	EEA 14-4	EEA 19-1
2.9	503	Caffeic acid dihexoside	696851	928496
5.2	633	HHDP-galloyl hexose	11716	59969
6.0	495	Digalloylquinic acid	7068	113696
6.3	483	Digalloyl glucose	0	30605
6.3	633	HHDP-galloyl hexose	0	19911
7.1	633	HHDP-galloyl hexose	8842	0
7.5	495	Digalloylquinic acid	66080	81793
8.4	633	HHDP-galloyl hexose	0	55336
8.6	577	Procyanidin dimer B	239208	0
8.7	503	Caffeic acid dihexoside	0	4730
8.9	495	Digalloylquinic acid	17634	6723
9.8	577	Procyanidin dimer B	151606	0
10.5	483	Digalloylglucose	21874	0
10.7	633	HHDP-galloyl hexose	64070	0
10.8	495	Digalloylquinic acid	162038	222575
10.8	289	(Epi)catechin	226059	0
12.2	289	(Epi)catechin	278055	24026
12.4	453	Digalloylpentose	0	0
13.0	625	Quercetin-O-dihexoside	64035	0
13.1	325	Unknown	0	68474
13.1	431	Apigenin-O-glucoside	0	14725
13.8	635	Trigalloyl glucose	0	45520
14.2	631	Myricetin-O-galloyl hexoside	86157	335554
15.0	454	Digalloylpentose	75410	58948
15.4	631	Myricetin-O-galloyl hexoside	121360	430095
15.6	635	Trigalloyl glucose	0	15662
15.7	479	Myricetin-O-hexoside	3569292	0
15.7	448	Luteolin-O-hexoside/Kaempferol-	0	69735
15.9	402	Benzyl alcohol hexose pentose	23182	0
15.9	577	Procyanidin dimer B	52598	0
16.1	453	Digalloylpentose	0	0
16.2	479	Myricetin-O-hexoside	5677160	1572764
16.6	445	Kaempferol-O-hexoside	0	0
17.0	615	Quercetin-O-galloyl hexoside	0	25162
17.0	577	Procyanidin dimer B	124668	0
17.0	631	Myricetin-O-galloyl hexoside	52583	774524
17.3	477	Quercetin-O-glucuronide	0	87232
17.6	449	Myricetin-O-pentoside	623175	2900452
17.7	463	Quercetin-O-hexoside	64900	124321
18.3	755	Unknown	223485	0
18.5	479	Myricetin-O-hexoside	190968	18018
18.7	433	Quercetin-O-pentoside	19481	0
19.0	625	Quercetin-O-dihexoside	18218	0
19.1	461	Myricetin-O-deoxyhexoside	64852	0
19.1	615	Quercetin-O-galloyl hexoside	0	0
19.7	479	Myricetin-O-hexoside	1056128	1564223

20.0	615	Quercetin-O-galloyl hexoside	1349758	810150
20.4	625	Quercetin-O-dihexoside	112860	0
20.7	449	Myricetin-O-pentoside	0	401002
20.7	441	(Epi)catechin-O-gallate	89144	0
20.8	433	Quercetin-O-pentoside	679756	180603
21.0	615	Quercetin-O-galloyl hexoside	0	308886
21.1	625	Quercetin-O-dihexoside	0	0
21.2	463	Myricetin-O-rhamnoside	0	435813
21.5	449	Myricetin-O-pentoside	0	1924886
21.5	477	Isorhamnetin-O-hexoside	0	113133
21.7	433	Quercetin-O-pentoside	153076	855862
22.0	477	Quercetin-O-glucuronide	1970624	0
22.6	463	Quercetin-O-hexoside	34035259	5646348
22.6	301	Ellagic acid	0	0
23.0	449	Taxifolin-O-rhamnoside	0	0
23.0	477	Quercetin-O-glucuronide	5131353	119854
23.1	463	Quercetin-O-hexoside	0	0
23.6	625	Quercetin-O-dihexoside	38571	0
24.1	433	Quercetin-O-pentoside	900	4429711
24.2	599	Quercetin-hexose-protocatechuic	62929	101018
24.6	447	Kaempferol-O-hexoside	0	142263
24.7	433	Quercetin-O-pentoside	0	8082945
25.1	447	Quercetin-O-rhamnoside	0	0
25.5	463	Quercetin-O-hexoside	0	0
25.6	477	Isorhamnetin-O-hexoside	0	902239
26.0	505	Quercetin-O-acetyl hexoside	43993	0
26.0	461	Kaempferol-O-glucuronide	0	0
26.2	447	Quercetin-O-rhamnoside	431922	0
26.5	475	Luteolin-methyl ether-O-glucuron	0	0
26.7	463	Quercetin-O-hexoside	0	0
26.7	477	Isorhamnetin-O-hexoside	113012	0
27.1	613	Myricetin-O-galloyl deoxyhexosid	0	0
27.2	417	Kaempferol-O-pentoside	0	162430
27.4	505	Quercetin-O-acetyl hexoside	820025	61174
27.9	625	Quercetin-O-dihexoside	0	470740
27.9	479	Myricetin-O-hexoside	0	0
28.0	463	Quercetin-O-hexoside	0	0
28.2	315	Isorhamnetin	52370	0
28.3	639	Methoxyquercetin-O-hexoside	0	31332
28.4	417	Kaempferol-O-pentoside	0	91784
28.5	476	Luteolin-methyl ether-O-glucuron	0	248938
28.5	505	Quercetin-O-acetyl hexoside	140176	36480
28.6	301	Ellagic acid	0	0
28.9	431	Kaempferol-O-rhamnoside	0	0
29.4	490	Isorhamnetin-O-glucuronide	0	0
29.6	645	Galloylmethylmyricetin hexoside	0	37179
30.2	610	Quercetin-O-rhamnosylhexoside	0	2280089
30.6	639	Isorhamnetin-O-dihexoside	0	0
31.2	489	Kaempferol-O-acetyl hexoside	0	0

31.4	607	Quercetin-O-rhamnosyl hexoside	8484	0
31.5	645	Galloylmethylmyricetin hexoside	0	0
31.8	609	Quercetin-O-rhamnosyl-O-hexosi	0	0
32.0	593	Kaempferol-O-coumaroyl glucosi	0	0
32.4	301	Quercetin	5147906	989372
32.4	331	Myricetin methyl ether	0	0
32.7	623	Isorhamnetin-O-rutinoside	0	103774
33.6	595	Eriodictyol-O-rutinoside	0	0
35.3	301	Ellagic acid	0	0
36.0	285	Kaempferol	0	13873
36.4	315	Isorhamnetin	0	42386
36.8	462	Quercetin-O-hexoside	0	0

Peak area

EEA 19-1 ha	EEA 23-2	EEA 27-1
920219	491459	249507
0	0	13152
322962	98633	242360
0	0	0
0	0	32166
0	0	0
244916	62909	208872
40273	0	40266
0	0	0
0	0	0
120605	87825	236289
0	0	0
8491	0	0
0	0	0
271055	142399	367673
0	0	0
0	0	0
193707	0	0
0	0	0
0	265614	468986
0	0	0
48061	0	0
846859	474842	293278
0	0	0
1330703	485445	488827
0	0	0
0	0	0
0	250084	0
132466	91951	0
0	0	0
52091	0	0
4139215	6356243	5371673
7472	0	0
78763	0	37323
0	0	0
454415	297526	599346
0	0	0
0	0	168915
187015	153860	170590
0	203830	40148
1388815	1893084	1188375
0	0	0
0	0	27333
0	209550	0
3364330	0	1459611
4771867	4490937	3943758

6854957	4991997	2820902
353526	253075	0
0	494304	129362
0	0	0
750503	645277	539691
0	0	0
251488	0	0
6269612	7232712	5647368
500572	0	0
0	0	0
0	0	0
10273781	2898910	3770144
19847432	24958666	13424705
0	0	1493105
0	0	0
10273781	0	10419370
0	0	1731176
0	0	0
0	0	0
100549	325358	176352
3411150	0	220035
357348	1526746	1273563
0	407500	0
0	0	45414
1086417	388357	0
93566	229040	0
0	52340	0
1086417	5463380	1682225
0	76956	0
0	51549	42273
0	0	335797
0	104745	0
0	0	0
1356968	1673462	2139269
0	130758	180054
82784	103559	55129
0	233303	0
0	0	0
0	0	56791
0	0	0
0	0	0
2616709	3697416	1855001
0	0	23421
64509	0	0
34507	0	0
126229	0	22715
1759146	929080	1099444
168095	121017	84717
97726	0	46488

0	0	0
76404	23577	0
0	35961	67078
153529	62106	0
5124280	3273680	2405055
69624	27957	4072
0	0	27290
71698	0	0
0	0	0
187292	6370	16021
75742	0	261031
0	0	5910

Spots per object

NT	24 hrs				48 hrs		
0 0 0 0	0.25	0.29	0.32	0.27	0.88	0.9	0.76
0 0 0 0	0.27	0.29	0.34	0.26	0.91	0.82	0.76
0 0 0 0	0.27	0.23	0.32	0.25	0.91	0.77	0.81
0 0 0 0	0.32	0.34	0.31	0.29	0.69	0.77	0.8
0 0 0 0	0.28	0.33	0.33	0.3	0.94	0.79	0.75
0 0 0 0	0.27	0.3	0.32	0.28	1.01	0.75	0.71
0 0 0 0	0.29	0.28	0.3	0.25	0.99	0.85	0.74
0 0 0 0	0.26	0.3	0.29	0.27	0.93	0.72	0.83
0 0 0 0	0.3	0.29	0.29	0.24	0.92	0.8	0.78
0 0 0 0	0.3	0.25	0.29	0.28	0.94	0.8	0.77
0 0 0 0	0.25	0.28	0.33	0.26	0.94	0.77	0.75
0 0 0 0	0.29	0.33	0.34	0.28	1.04	0.79	0.81
0 0 0 0	0.25	0.29	0.31	0.35	0.97	0.83	0.74
0 0 0 0	0.26	0.32	0.3	0.27	0.96	0.78	0.71
0 0 0 0	0.26	0.32	0.34	0.31	0.94	0.81	0.75
0 0 0 0	0.27	0.3	0.31	0.33	0.84	0.75	0.8
0 0 0 0	0.29	0.26	0.32	0.26	0.92	0.79	0.8
0 0 0 0	0.29	0.29	0.33	0.25	0.94	0.78	0.77
0 0 0 0	0.28	0.3	0.31	0.25	0.97	0.74	0.72
0 0 0 0	0.25	0.34	0.32	0.29	0.92	0.76	0.76
0 0 0 0	0.32	0.31	0.35	0.3	0.99	0.78	0.78
0 0 0 0	0.32	0.36	0.31	0.29	0.97	0.79	0.75
0 0 0 0	0.22	0.31	0.33	0.32	1	0.76	0.77
0 0 0 0	0.23	0.29	0.32	0.34	0.91	0.78	0.78
0 0 0 0	0.22	0.26	0.37	0.26	0.89	0.82	0.69
0 0 0 0	0.31	0.28	0.28	0.22	0.97	0.78	0.8
0 0 0 0	0.21	0.31	0.31	0.25	0.95	0.79	0.76
0 0 0 0	0.24	0.27	0.3	0.27	0.96	0.77	0.77
0 0 0 0	0.25	0.25	0.39	0.34	0.92	0.76	0.77
0 0 0 0	0.29	0.35	0.37	0.31	0.96	0.78	0.82
0 0 0 0	0.24	0.31	0.33	0.3	0.94	0.77	0.8
0 0 0 0	0.27	0.34	0.35	0.33	0.94	0.82	0.79
0 0 0	0.31	0.34	0.23		0.78	0.8	
0 0 0	0.31	0.32	0.27		0.76	0.82	
0 0 0	0.3	0.29	0.25		0.78	0.77	
0 0 0	0.3	0.32	0.31		0.77	0.83	
0 0 0	0.27	0.32	0.33				
0 0 0	0.28	0.36	0.33				
0 0 0	0.25	0.32	0.3				
0 0 0	0.32	0.34	0.32				
0 0 0	0.25	0.27	0.26				
0 0 0	0.29	0.27	0.24				
0 0 0	0.3	0.3	0.27				
0 0 0	0.25	0.31	0.28				
0 0 0	0.23	0.26	0.29				
0 0 0	0.32	0.33	0.29				
0 0 0	0.27	0.3	0.27				
0 0 0	0.29	0.33	0.3				

Z' factor

24h	48 h
0.67	0.81
0.689	0.876
0.753	0.867
0.664	

% Dead cells (7AAD+)

Treatment	Concentration (ug/mL)	n=1	n=2	n=3
NT	-	1.14	0.09	0.04375
DMSO	0.25%	0.9575	0.065	0.12625
DMSO	10%	82.41	66.3375	62.4075
EAC 14-4	0,25	0.915	0.04	0.06
EAC 14-4	2,5	0.74	0.02	0.085
EAC 14-4	25	2.225	2.82	1.665
EAC 14-4	50	5.065	10.51	9.85
EAC 14-4	100	11.37	19.845	19.445
EAC 19-1	0,25	0.94	0.345	0.505
EAC 19-1	2,5	5.55	2.395	4.945
EAC 19-1	25	43.875	31.915	49.385
EAC 19-1	50	73.58	47.725	73.435
EAC 19-1	100	85.225	85.08501	97.875
EAC 19-1ha	0,25	0.53	0.6	0.39
EAC 19-1ha	2,5	2.82	4.525	3.79
EAC 19-1ha	25	33.1	48.84	30.535
EAC 19-1ha	50	62.005	74.145	51.97
EAC 19-1ha	100	83.64	88.705	70.995
EAC 19-2	0,25	1.185	0.15	0.12
EAC 19-2	2,5	2.82	0.955	2.005
EAC 19-2	25	31.025	21.625	44.78
EAC 19-2	50	61.26	60.955	67.93
EAC 19-2	100	85.56	84.165	80.25999
EAC 22-1	0,25	0.5	0.065	0.39
EAC 22-1	2,5	0.895	0.33	1.07
EAC 22-1	25	8.545	9.58	16.205
EAC 22-1	50	24.675	14.88	31.66
EAC 22-1	100	63.57	29.04	29.48
EAC 23-2	0,25	1.26	0.38	1.35
EAC 23-2	2,5	7.585	4.015	6.745
EAC 23-2	25	65.13	44.08	55.685
EAC 23-2	50	81.28	70.75999	80.975
EAC 23-2	100	74.66	89.39	75.215
EAC 27-1	0,25	0.36	0.765	0.075
EAC 27-1	2,5	2.865	0.465	0.365
EAC 27-1	25	8.155	12.99	3.39
EAC 27-1	50	30.585	52.82	19.56
EAC 27-1	100	45.16	43.665	26.865
EAC 31-1	0,25	0.64	0.135	1.785
EAC 31-1	2,5	0.46	1.885	10.99
EAC 31-1	25	34.595	53.825	66.66
EAC 31-1	50	38.16	76.435	73.04
EAC 31-1	100	47.24	89.21001	62.805

% Dead cells (7AAD+)

Treatment	Concentration (ug/mL)	n=1	n=2	n=3
NT	-	0.285	0.575	0.675
DMSO	0.25%	0.465	0.7625	0.17625
DMSO	10%	82.41	66.3375	62.4075
EEA 14-4	0,25	0.98	0.18	0
EEA 14-4	2,5	0.57	0.15	0.245
EEA 14-4	25	0.37	0.11	0.36
EEA 14-4	50	0.5	0.18	0.195
EEA 14-4	100	0.99	0.05	0.26
EEA 19-1	0,25	0.49	0.05	0.085
EEA 19-1	2,5	1.36	1.32	0.055
EEA 19-1	25	0.99	0.62	0.16
EEA 19-1	50	0.28	0.28	0.22
EEA 19-1	100	0.31	0.29	1.1
EEA 19-1ha	0,25	0	0	0.055
EEA 19-1ha	2,5	0.17	0.17	0.055
EEA 19-1ha	25	0.5	0.5	0.125
EEA 19-1ha	50	0	0.61	0.26
EEA 19-1ha	100	0.52	0.17	0.275
EEA 19-2	0,25	0.82	0.82	0.06
EEA 19-2	2,5	0.85	0.74	0.1
EEA 19-2	25	0.32	0.04	0.3
EEA 19-2	50	0.09	0.29	0.06
EEA 19-2	100	0.9	1.34	0.41
EEA 22-1	0,25	0	0.17	0
EEA 22-1	2,5	0.27	0.27	0.05
EEA 22-1	25	0.45	0.09	0
EEA 22-1	50	0.38	0.29	0.03
EEA 22-1	100	0.65	0.58	0.135
EEA 23-2	0,25	0.2	0.43	0.215
EEA 23-2	2,5	0.24	0	0.03
EEA 23-2	25	0.04	0.12	0.065
EEA 23-2	50	0.92	0.92	0.26
EEA 23-2	100	0.29	0.09	0.415
EEA 27-1	0,25	0.39	0.05	0.05
EEA 27-1	2,5	0.58	0.22	0.04
EEA 27-1	25	0.9	0.36	0.235
EEA 27-1	50	0.1	0.1	0.295
EEA 27-1	100	0.41	0.25	0.22
EEA 31-1	0,25	0.15	0.26	0.25
EEA 31-1	2,5	0.24	0.24	0.345
EEA 31-1	25	0.48	0.72	0.35
EEA 31-1	50	0.42	0.16	0.325
EEA 31-1	100	3.11	2.26	2.685

Treatment	Concentration (ug/mL)	Inclusions/Cell EGFP(+)		
		n=1	n=2	n=3
NT	-	0	0	0
DMSO	0.25%	0	0	0
NT PQ79	-	0.435	0.425	0.4825
DMSO PQ79	0.25%	0.56	0.4975	0.60875
EAC 14-4	12.5	0.57	0.505	0.6
EAC 14-4	25	0.61	0.475	0.64
EAC 14-4	50	0.6	0.52	0.615
EAC 14-4	100	0.6	0.495	0.635
EAC 19-1	3.125	0.575	0.555	0.62
EAC 19-1	6.25	0.5	0.53	0.65
EAC 19-1	12.5	0.565	0.53	0.62
EAC 19-1	25	0.57	0.57	0.635
EAC 19-1ha	3.125	0.52	0.515	0.595
EAC 19-1ha	6.25	0.515	0.53	0.595
EAC 19-1ha	12.5	0.57	0.53	0.625
EAC 19-1ha	25	0.625	0.54	0.64
EAC 19-2	3.125	0.605	0.515	0.63
EAC 19-2	6.25	0.6	0.53	0.6
EAC 19-2	12.5	0.515	0.545	0.64
EAC 19-2	25	0.585	0.53	0.625
EAC 22-1	3.125	0.53	0.525	0.635
EAC 22-1	6.25	0.595	0.53	0.56
EAC 22-1	12.5	0.605	0.515	0.62
EAC 22-1	25	0.64	0.53	0.61
EAC 23-2	3.125	0.6	0.505	0.625
EAC 23-2	6.25	0.62	0.53	0.645
EAC 23-2	12.5	0.585	0.525	0.635
EAC 23-2	25	0.52	0.505	0.585
EAC 27-1	3.125	0.58	0.52	0.615
EAC 27-1	6.25	0.595	0.495	0.595
EAC 27-1	12.5	0.58	0.51	0.61
EAC 27-1	25	0.57	0.475	0.625
EAC 31-1	3.125	0.56	0.54	0.59
EAC 31-1	6.25	0.645	0.505	0.58
EAC 31-1	12.5	0.55	0.49	0.61
EAC 31-1	25	0.575	0.505	0.605

Treatment	Concentration (ug/mL)	Inclusions/Cell EGFP(+)		
		n=1	n=2	n=3
NT	-	0	0	0
DMSO	0.25%	0	0	0
NT PQ79	-	0.44	0.425	0.4825
DMSO PQ79	0.25%	0.580	0.56	0.58
EAC 14-4	12.5	0.55	0.62	0.54
EAC 14-4	25	0.58	0.6	0.555
EAC 14-4	50	0.54	0.54	0.53
EAC 14-4	100	0.43	0.45	0.435
EAC 19-1	12.5	0.63	0.59	0.495
EAC 19-1	25	0.56	0.56	0.54
EAC 19-1	50	0.52	0.59	0.515
EAC 19-1	100	0.43	0.45	0.465
EAC 19-1ha	12.5	0.56	0.59	0.55
EAC 19-1ha	25	0.54	0.54	0.55
EAC 19-1ha	50	0.57	0.51	0.565
EAC 19-1ha	100	0.44	0.45	0.455
EAC 19-2	12.5	0.6	0.61	0.56
EAC 19-2	25	0.52	0.58	0.575
EAC 19-2	50	0.5	0.56	0.545
EAC 19-2	100	0.46	0.47	0.49
EAC 22-1	12.5	0.58	0.61	0.58
EAC 22-1	25	0.53	0.59	0.54
EAC 22-1	50	0.58	0.53	0.52
EAC 22-1	100	0.46	0.44	0.48
EAC 23-2	12.5	0.67	0.64	0.56
EAC 23-2	25	0.59	0.52	0.56
EAC 23-2	50	0.53	0.59	0.525
EAC 23-2	100	0.4	0.48	0.47
EAC 27-1	12.5	0.63	0.53	0.495
EAC 27-1	25	0.54	0.55	0.555
EAC 27-1	50	0.55	0.54	0.505
EAC 27-1	100	0.47	0.43	0.42
EAC 31-1	12.5	0.62	0.53	0.55
EAC 31-1	25	0.6	0.57	0.555
EAC 31-1	50	0.51	0.56	0.505
EAC 31-1	100	0.42	0.46	0.495

	AGG	HSP90	Norm	%	
DMSO	1,156,180.00	2169396	0.53295019	100	DMSO
EEA 19-1	418,212.00	1886124	0.22173091	41.6	EEA 19-1

	AGG	HSP90	Norm	%	
DMSO	3577100	5786944	0.61813282	100	DMSO
EEA 19-1	2491564	5466160	0.45581615	73.7	EEA 19-1

	AGG	HSP90	Norm	%	
DMSO	851004	2811040	0.30273635	100	DMSO
EEA 19-1	771340	4427604	0.17421161	57.5	EEA 19-1

	AGG	HSP90	Norm	%	
DMSO	6105940	4442344	1.37448608	100	DMSO
EEA 19-1	4835684	6053896	0.79877223	58.1	EEA 19-1

	AGG	HSP90	Norm	%	
DMSO	4552856	4787776	0.95093338	100	DMSO
EEA 14-4	3695016	5197976	0.71085669	74.8	EEA 14-4
EEA 19-1					EEA 19-1
EEA 19-1ha	4184588	5737212	0.72937657	76.7	EEA 19-1ha
EEA 23-2	5407004	6544588	0.82617943	86.9	EEA 23-2
EEA 27-1	4526992	6393536	0.70805764	74.5	EEA 27-1

	AGG	HSP90	Norm	%	
DMSO	4225084	4347284	0.9718905	100.0	DMSO
EEA 14-4	2880032	3344760	0.86105789	88.6	EEA 14-4
EEA 19-1					EEA 19-1
EEA 19-1ha	4442988	4092620	1.08560971	111.7	EEA 19-1ha
EEA 23-2	4839708	5115712	0.94604778	97.3	EEA 23-2
EEA 27-1	2810180	5305376	0.52968536	54.5	EEA 27-1

	AGG	HSP90	Norm	%	
DMSO	3274243	5829876	0.56163167	100.0	DMSO
EEA 14-4	3740789	6240984	0.5993909	106.7	EEA 14-4
EEA 19-1	1872545	6009660	0.31158917	55.5	EEA 19-1
EEA 19-1ha	3299900	5846452	0.56442779	100.5	EEA 19-1ha
EEA 23-2	3082698	6053904	0.50920827	90.7	EEA 23-2
EEA 27-1	4319352	5550512	0.77818983	138.6	EEA 27-1

MON	HSP90	Norm	%
5882132	2169396	2.71141461	100
2117108	1886124	1.12246491	41.4

MON	HSP90	Norm	%
13537231	5786944	2.33927112	100
11721999	5466160	2.14446687	91.7

MON	HSP90	Norm	%
5263776	2811040	1.87253685	100
5693740	4427604	1.28596415	68.7

MON	HSP90	Norm	%
8743336	4442344	1.96818076	100
7355788	6053896	1.21505028	61.7

MON	HSP90	Norm	%
9384100	4787776	1.96001233	100
10387836	5197976	1.99843862	102

11621064	5737212	2.02555945	103
13305020	6544588	2.03298053	104
16468080	6393536	2.575739	131

MON	HSP90	Norm	%
4653336	4347284	1.07040074	100.0
4806268	3344760	1.43695452	134.2

5197036	4092620	1.2698555	118.6
5038244	5115712	0.98485685	92.0
6056832	5305376	1.14164048	106.7

MON	HSP90	Norm	%
4023720	5829876	0.69018964	100.0
4075584	6240984	0.65303548	94.6
2541060	6009660	0.42282924	61.3
2967020	5846452	0.5074907	73.5
4189928	6053904	0.69210348	100.3
5544712	5550512	0.99895505	144.7

n=1				
Monomers	MON	HSP90	Norm	%
DMSO	10072084	2458056	4.09758118	100.0
EEA 14-4	9493016	3241712	2.92839586	71.5
EEA 19-1	8313716	4266972	1.94838776	47.5
EEA 19-1ha	9703900	3465344	2.80027033	68.3
EEA 23-2	9614008	4744556	2.02632406	49.5
EEA 27-1	7578092	4074888	1.85970559	45.4
n=2				
Monomers	MON	HSP90	Norm	%
DMSO	4438280	4750196	0.93433618	100.0
EEA 14-4	5203472	7683492	0.67722749	72.5
EEA 19-1	4036672	5548332	0.72754695	77.9
EEA 19-1ha	5270144	7663536	0.6876909	73.6
EEA 23-2	4964020	5621348	0.88306577	94.5
EEA 27-1	5372028	5410144	0.99295472	106.3
n=3				
Monomers	MON	HSP90	Norm	%
DMSO	7163692	5529516	1.2955369	100.0
EEA 14-4	6412196	4414252	1.45261213	112.1
EEA 19-1	6477076	4014156	1.61355862	124.5
EEA 19-1ha	6146812	3414604	1.80015369	139.0
EEA 23-2	5731964	4127580	1.38869846	107.2
EEA 27-1	5229524	3621744	1.44392425	111.5

n=1	AGG	HSP90	Norm	%	%
DMSO	14412472	3490820	4.12867808	100.0	108.6
EEA 14-4	12990692	2062092	6.29976354	152.6	165.6
EEA 19-1	10012960	2739004	3.94205047	62.6	103.7
EEA 19-1ha	10797292	2988724	4.96175492	125.9	130.5
EEA 23-2	14829316	2948516	4.36191901	87.9	114.7
EEA 27-1	12861188	2571824	3.89333018	89.3	102.4

n=2	AGG	HSP90	Norm	%	%
DMSO	8126172	4437584	1.83121536	100.0	48.2
EEA 14-4	10022428	4272412	2.34584773	128.1	61.7
EEA 19-1	7332320	3866548	1.89634785	103.6	49.9
EEA 19-1ha	7485260	3442460	2.17439273	118.7	57.2
EEA 23-2	6442176	4463020	1.44345667	78.8	38.0
EEA 27-1	3689688	4570460	0.80729029	44.1	21.2

n=3	AGG	HSP90	Norm	%	%
DMSO	29337844	5383628	5.44945602	100.0	143.3
EEA 14-4	21257652	5259252	4.04195349	74.2	106.3
EEA 19-1	18819116	6205088	3.03285239	55.7	79.7
EEA 19-1ha	18410596	6067200	3.03444686	55.7	79.8
EEA 23-2	21806156	6091556	3.57973496	65.7	94.1
EEA 27-1	19529380	6394608	3.05403865	56.0	80.3

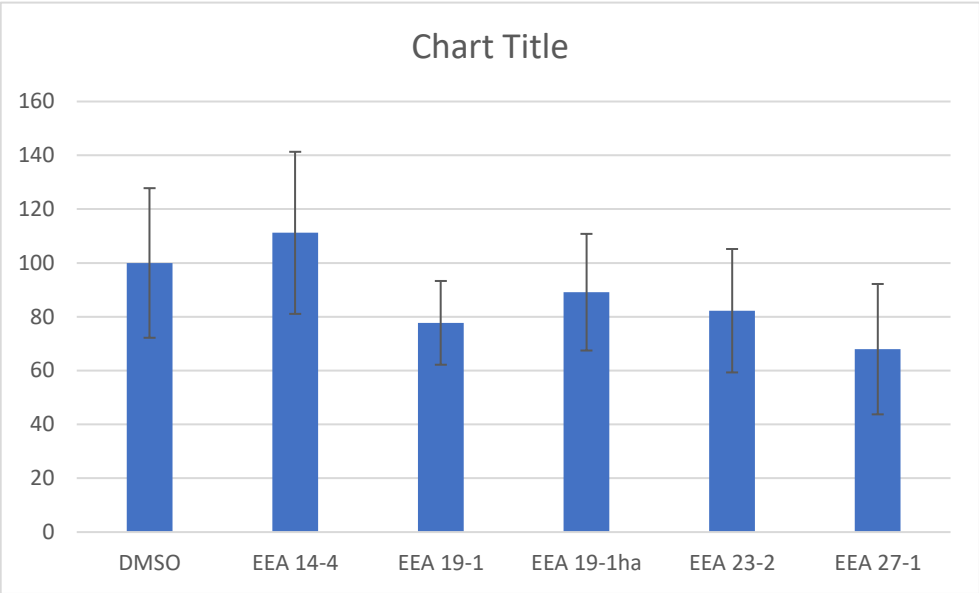
n=4	AGG	HSP90	Norm	%	%
DMSO	16,490,628.00	4,683,515.00	3.52099395	100.0	
EEA 19-1	11,633,416.00	3,824,818.00	3.04156067	86.4	

n=5	AGG	HSP90	Norm	%	%
DMSO	13060960	3244508	4.0255595	100.0	
EEA 19-1	11557760	3245012	3.56170023	88.47714795	

n=6	AGG	HSP90	Norm	%	%
DMSO	16785675	1647540	10.1883262	100	
EEA 19-1	8872236	2247896	3.9469068	38.73950153	

3.80311649

DMSO	108.56039	48.15038853	143.289222	100	27.7957407
EEA 14-4	165.647399	61.68224772	106.280034	111.203227	30.11293489
EEA 19-1	103.653161	49.86299685	79.7465028	77.7542203	15.55980229
EEA 19-1ha	130.465499	57.17397137	79.7884281	89.142633	21.66824006
EEA 23-2	114.693279	37.95457431	94.126356	82.2580699	22.93359525
EEA 27-1	102.372099	21.22707253	80.303579	67.9675836	24.22300164



n=1	MON	HSP90	Norm	%
DMSO	6648072	3490820	1.90444423	100.0
EEA 14-4	5918732	2062092	2.87025603	150.7
EEA 19-1	5598292	2739004	2.04391523	107.3
EEA 19-1ha	5206536	2988724	1.74205982	91.5
EEA 23-2	6146824	2948516	2.08471787	109.5
EEA 27-1	5796692	2571824	2.25392251	118.4

n=2	MON	HSP90	Norm	%
DMSO	5331848	4437584	1.20152047	100.0
EEA 14-4	3953460	4272412	0.92534615	77.0
EEA 19-1	4308624	3866548	1.11433351	92.7
EEA 19-1ha	5450732	3442460	1.58338281	131.8
EEA 23-2	6829972	4463020	1.53034761	127.4
EEA 27-1	6091232	4570460	1.33273937	110.9

n=3	MON	HSP90	Norm	%
DMSO	4387957	5383628	0.81505576	100.0
EEA 14-4	3530205	5259252	0.67123709	82.4
EEA 19-1	3474737	6205088	0.55998191	68.7
EEA 19-1ha	3699603	6067200	0.60977106	74.8
EEA 23-2	4256245	6091556	0.69871228	85.7
EEA 27-1	4015781	6394608	0.62799487	77.0

n=4	MON	HSP90	Norm	%
DMSO	5910220	4926456	1.19969	100.0
EEA 19-1	5819712	3995512	1.45656226	121.4

n=5	MON	HSP90	Norm	%
DMSO	3645960	3244508	1.12373278	100.0
EEA 19-1	3789920	3245012	1.16792172	103.9

n=6	MON	HSP90	Norm	%
DMSO	7488955	1647540	4.54553759	100
EEA 19-1	6975807	2247896	3.10326056	68.3

HEK polyQ11 - p62

	DMSO	EEA 19-1
n=1	100	154.6
n=2	100	211.7
n=3	100	84.8

HEK polyQ11 - LC3B

	DMSO	EEA 19-1
	100	145.5
	100	122.7
	100	108.4

HEK polyQ79 - p62

	DMSO	EEA 19-1
n=1	100	210.8
n=2	100	231.2
n=3	100	102

HEK polyQ79 - LC3B

	DMSO	EEA 19-1
	100	186.8
	100	142.6
	100	88.8

HEK mHTT - p62

	DMSO	EEA 19-1
n=1	100	48.4
n=2	100	123
n=3	100	111.9

HEK mHTT - LC3B

	DMSO	EEA 19-1
	100	127.2
	100	111
	100	69.2