

Figure 1

gi 4502067 Human	GPVPTPPDNIIQVQENFNSISRIAGKWNLAIGSTCPWLKKIMDRMTVSTLV	50
gi 197102775 Orangutan	GPVPTPPDNIIQVQENFNSISRIAGKWNLAIGSTCPWLKKIMDRMTVSTLV	50
gi 403266141 SQ Monkey	SPVPTPPEGIQVQENFNSISRIAGKWNLAIGSTCPWLKKIMDRMTVSTLV	50
gi 311703 Mouse	DPASTLP-DIQVQENFSESRIAGKWNLAIGSTCPWLKRIKDKMSVQTLV	49
gi 655878696 Rabbit	DPVPTLPDDIQVQENFELSRIGKWNLAIGSTCPWLKRIKDKMAVSTLV	50
gi 512843527 nm Rat	NPVPMPPDNIIQVQENFDESRIAGKWNLAIGSTCPWLKRIKDRLSVSTLV	50
gi 472354701 Walrus	SPVLTTPDAIQVQENFDISRIAGKWFHVMAGSTCPWLKKFMDRMSMSTLV	50
gi 471363267 Manatee	SPVKTPLNDIQVQENFDLPRIAGKWFNIAIGSTCPWLKRLKAGPTMSTLV	50
gi 478732996 Chicken	TPVGDQDEDIQVQENFEPERAGKWDYDVAVGTTCKWMKQYKFKSMGTLV	50
gi 556972695 Coelacanth	-GSPLADEDIQVQENFDLPRIAGKWEIAIASTCPWVKNHKDKMFMGTMV	49
gi 147905774 Frog	CSPIQPEDNIIQVQENFDLPRIAGKWDIAIGSTCKWLKHHKFKFMGTLE	50
gi 1091607 Plaice	-LPVLPEPLYPTQENFDLPRIAGKWDIAIGSTCKWLKHHKFKFMGTLE	49
gi 4502067 Human	LGEGATEAEISMTSTRWRKGVCEETSGAYEKTDTDGKFLYHNSKWNITME	100
gi 197102775 Orangutan	LGEGATEAEISMTSTRWRKGVCEETSGAYEKTDTDGKFLYHNSKWNITME	100
gi 403266141 SQ Monkey	LEEGATEAEISMTSTRWRKGVCEETSGAYEKTDTDGKFLYHNSKWNITME	100
gi 311703 Mouse	LQEGATEAEISMTSTRWRKGVCEETSGAYEKTDTDGKFLYHNSKWNITME	99
gi 655878696 Rabbit	LGEGTSETEISMTSTRWRKGVCEETSGAYEKTDTDGKFLYHNSKWNITME	100
gi 512843527 nm Rat	LKGTTTETQISTTHHWRQGVCEETSGAYEKTDTDGKFLYHNSKWNITME	100
gi 472354701 Walrus	LGEGATDGEISMTSTRWRKGVCEETSGAYEKTDTDGKFLYHNSKWNITME	100
gi 471363267 Manatee	LGEGATDTEISTSTRWRKGVCEETSGAYEKTDTDGKFLYHNSKWNITME	100
gi 478732996 Chicken	LGPGPSADQISTSTRWRKGVCEETSGAYEKTDTDGKFLYHNSKWNITME	100
gi 556972695 Coelacanth	LQEGEQSDRISTSTRWRKGVCEETSGAYEKTDTDGKFLYHNSKWNITME	99
gi 147905774 Frog	LSDGETDGEVRIVNTRMRHGTCQIVGSGYQKTETPGKFDYFNARWGTTIQ	100
gi 1091607 Plaice	LEK-DTGNKLVTRTRLRHGTCQIVGSGYQKTETPGKFDYFNARWGTTIQ	98
gi 4502067 Human	SYVHTNYDEYAIIFLTNKFSSRHGPTITAKLYGRAPQLRETLLQDFRVVA	150
gi 197102775 Orangutan	SYVHTNYDEYAIIFLTNKFSSRHGPTITAKLYGRAPQLRETLLQDFRVVA	150
gi 403266141 SQ Monkey	SYVAHTNYDEYAIIFLTNKFSSRHGPTITAKLYGREPQLRESLLQDFRVVA	150
gi 311703 Mouse	SYVHTNYDEYAIIFLTNKFSSRHGPTITAKLYGREPQLRESLLQDFRVVA	149
gi 655878696 Rabbit	SYVHTNYDEYAIIFLTNKFSSRHGPTITAKLYGREPQLRESLLQDFRVVA	150
gi 512843527 nm Rat	SYVHTNYDEYAIIFLTNKFSSRHGPTITAKLYGREPQLRESLLQDFRVVA	150
gi 472354701 Walrus	SYVHTNYDEYAIIFLTNKFSSRHGPTITAKLYGRQPQLRESLLQDFRVVA	150
gi 471363267 Manatee	SYVHTNYDEYAIIFLTNKFSSRHGPTITAKLYGRQPQLRESLLQDFRVVA	149
gi 478732996 Chicken	SYVHTNYDEYAIIFLTNKFSSRHGPTITAKLYGRQPQLRESLLQDFRVVA	149
gi 556972695 Coelacanth	SYVHTNYDEYAIIFLTNKFSSRHGPTITAKLYGRQPQLRESLLQDFRVVA	148
gi 147905774 Frog	NYIVFTNYDEYAIIFLTNKFSSRHGPTITAKLYGRQPQLRESLLQDFRVVA	149
gi 1091607 Plaice	AYVHTNYDEYAIIFLTNKFSSRHGPTITAKLYGRQPQLRESLLQDFRVVA	148
gi 4502067 Human	QGVGIPEDSIFTMADRGECPVGEQEPILIPR---	183 identity:100%
gi 197102775 Orangutan	QGVGIPEDSIFTMADRGECPVGEQEPILIPR---	183 99.5%
gi 403266141 SQ Monkey	QGVGIPEDSIFTMADRGECPVGEQEPILIPR---	183 98.5%
gi 311703 Mouse	LNVGISENSIIFMPDRGECPVGEQEPILIPR---	182 75.8%
gi 655878696 Rabbit	LGVGIPEDSIFTMADRGECPVGEQEPILIPR---	183 83.1%
gi 512843527 nm Rat	LGVGIPEDSIFTMADRGECPVGEQEPILIPR---	183 77.6%
gi 472354701 Walrus	LGVGIPEDSIFTMANKGECPVGEQEPILIPR---	183 81.4%
gi 471363267 Manatee	LGVGIPEDSIFTTADKGECPVGEQEPILIPR---	182 76.4%
gi 478732996 Chicken	LEMGIPADSVFILANKGECPVGEQEPILIPR---	179 50.3%
gi 556972695 Coelacanth	LDQGIDEDSIYILPKRDECPVGEQEPILIPR---	180 50.0%
gi 147905774 Frog	LAQGIPEDSIVMLPNNGECPVGEQEPILIPR---	179 48.0%
gi 1091607 Plaice	RHQGMSDDTIIKQNKGCIPGEQEPILIPR---	184 36.5%

Figure 2

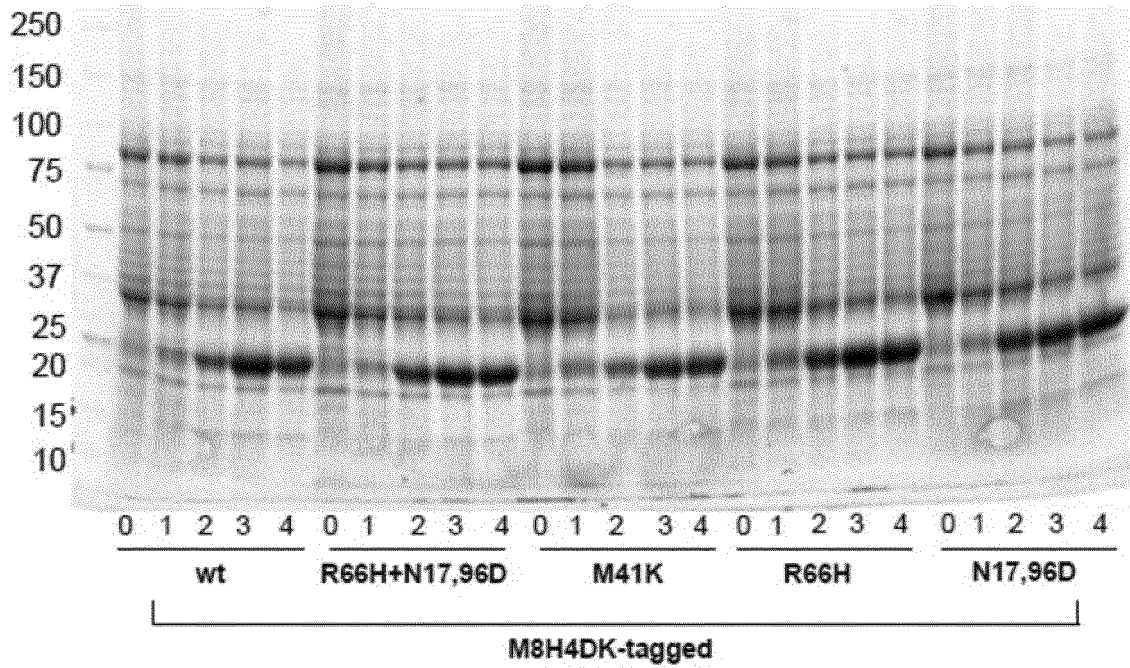
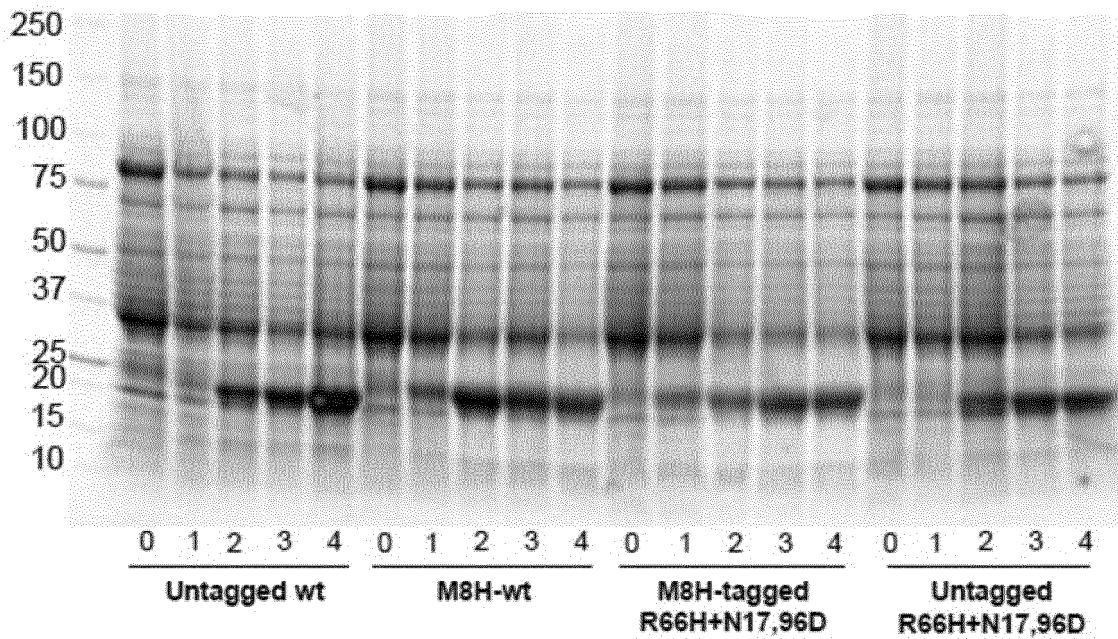


Figure 3

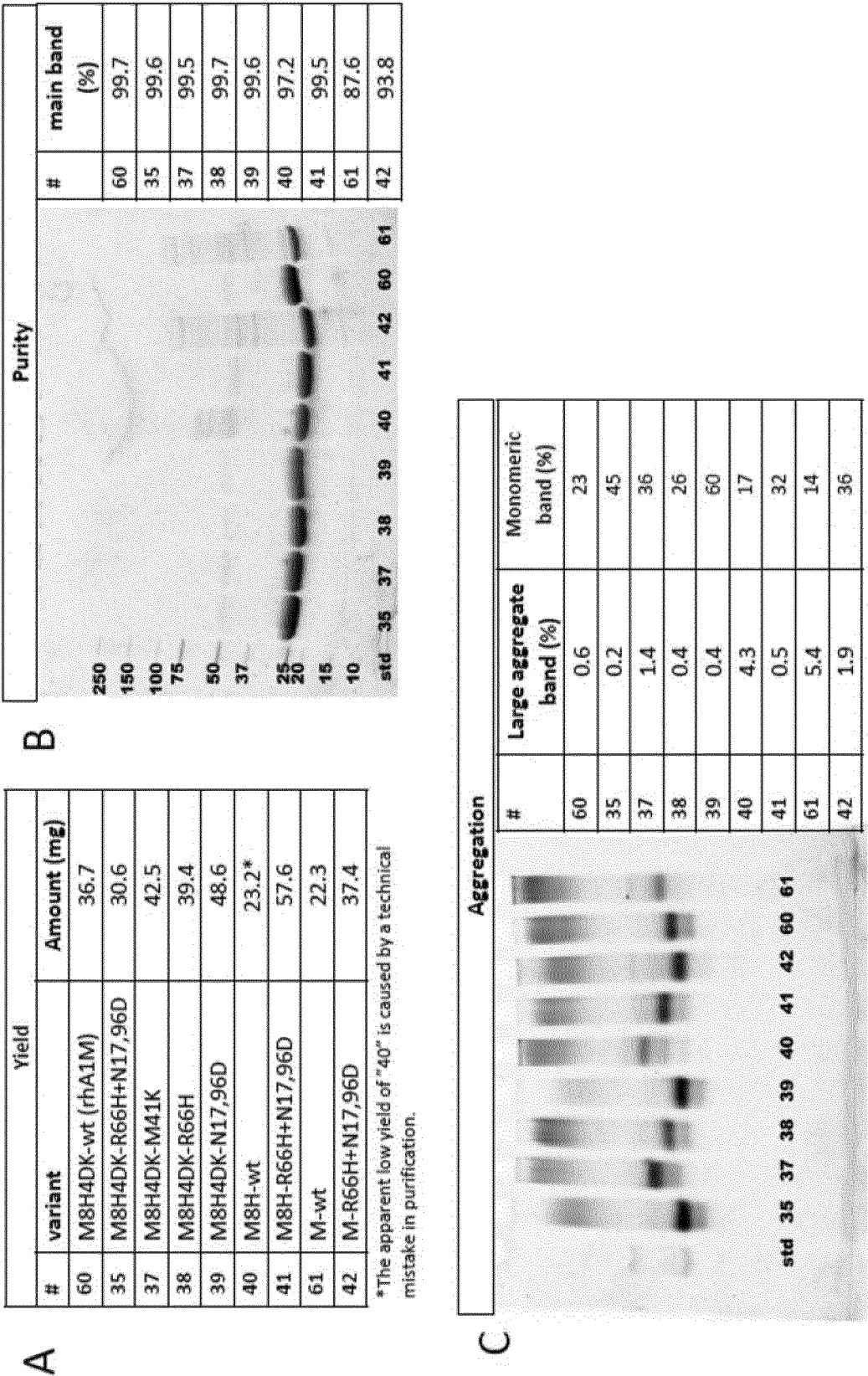


Figure 4

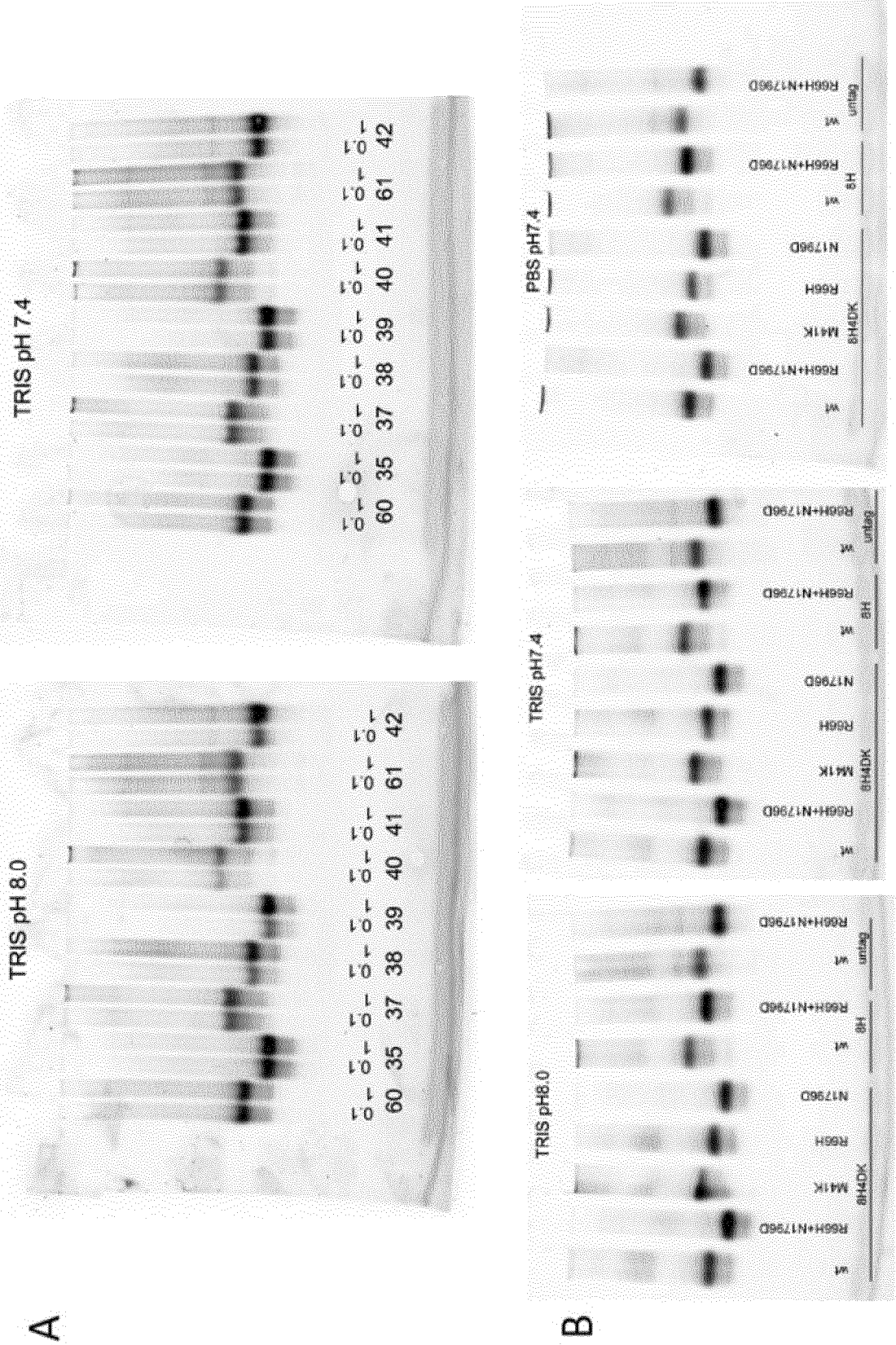


Figure 5

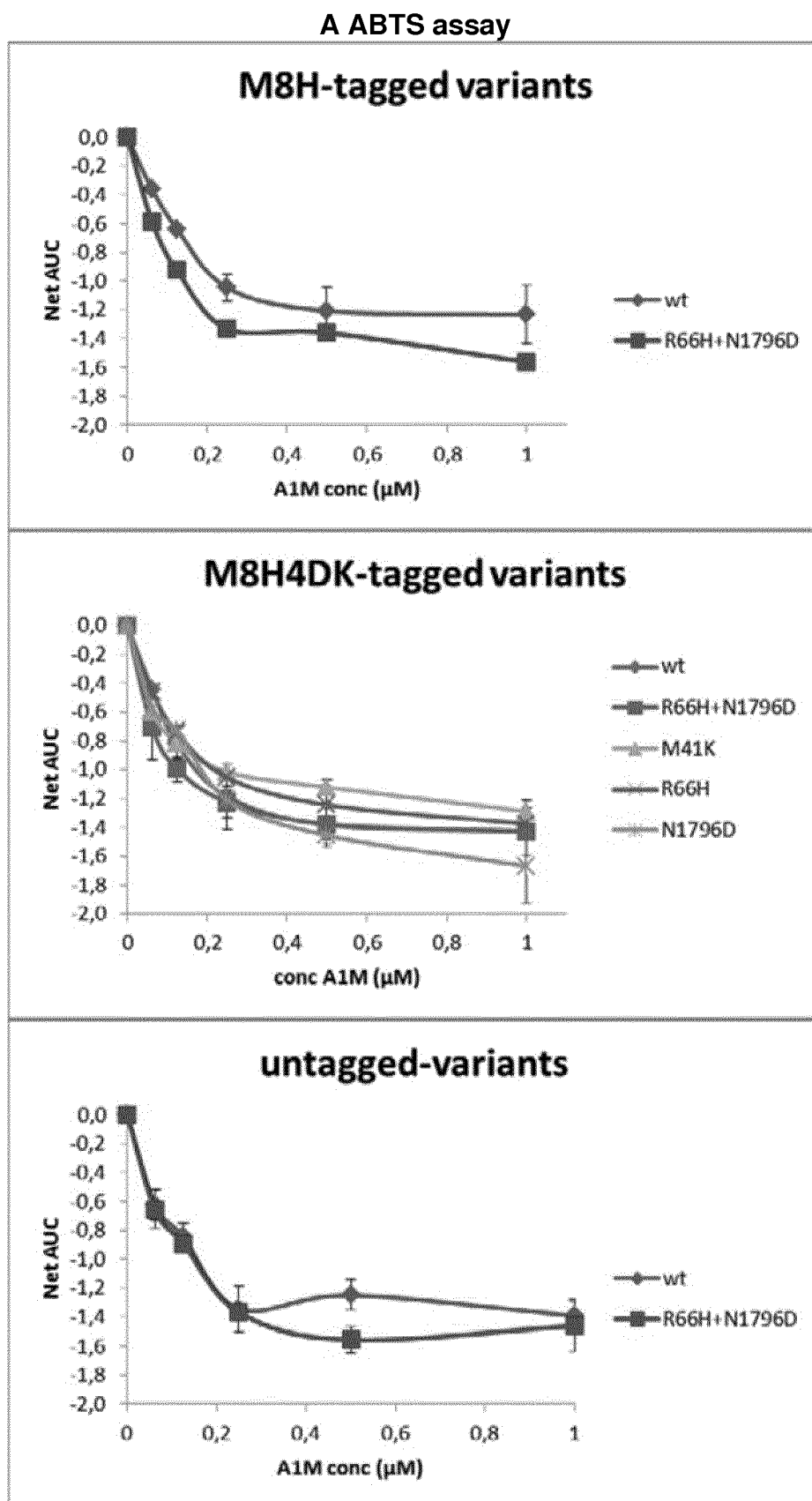


Figure 5 – continued

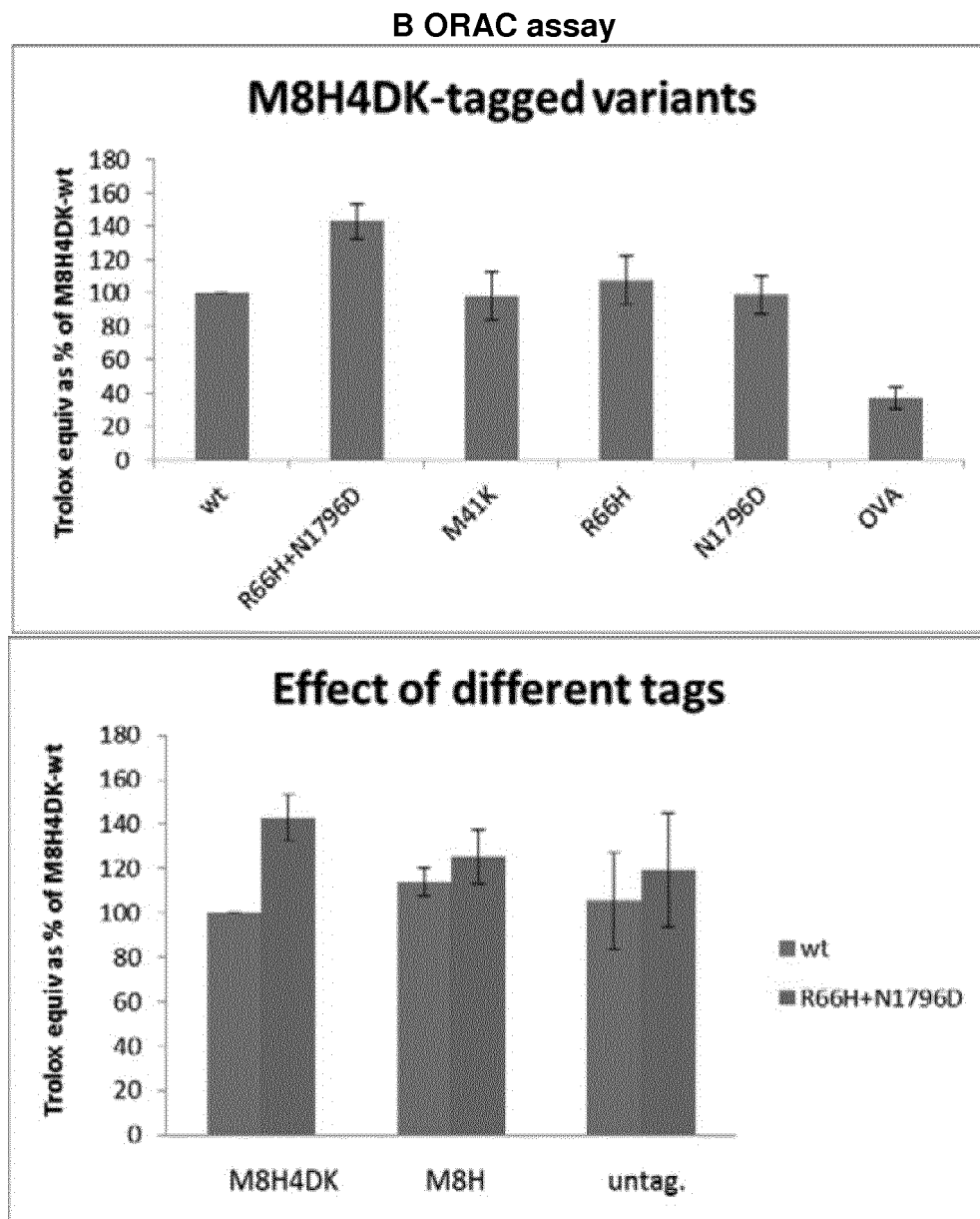


Figure 6

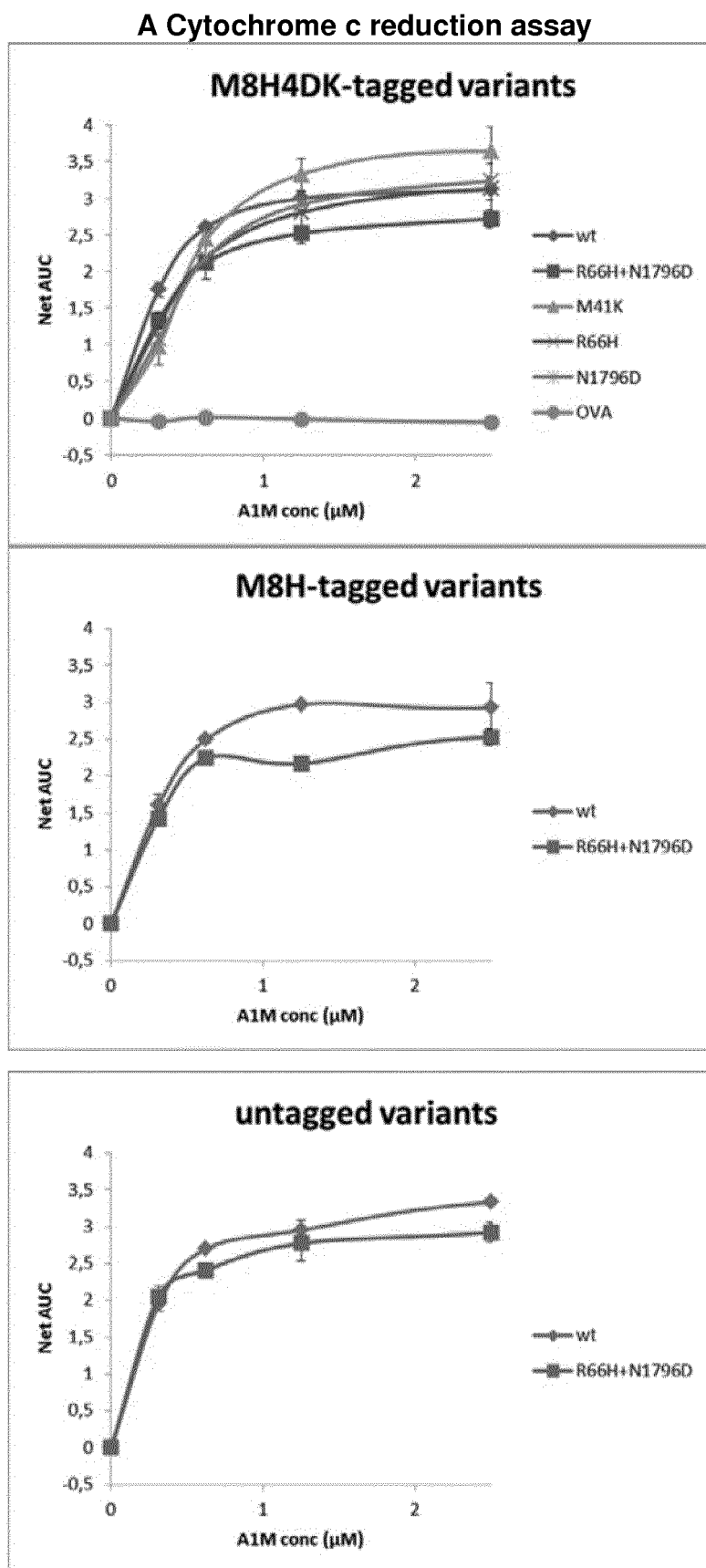
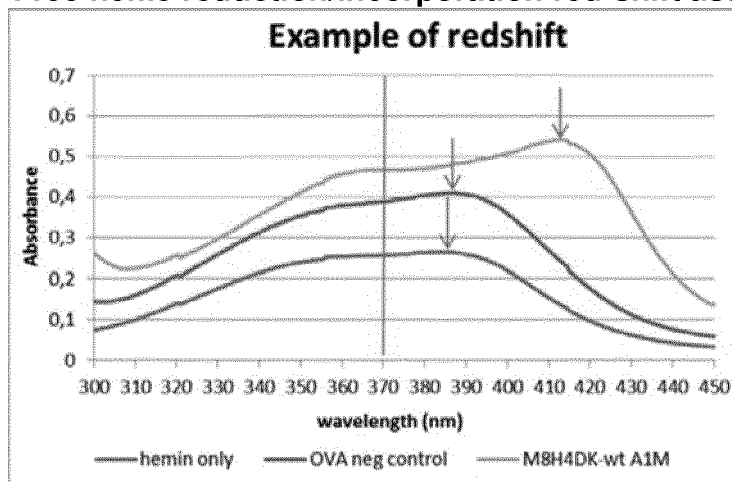


Figure 6 – continued

B Free heme reduction/incorporation red-shift assay

#	variant	max (370-450nm)	ratio 413:386
	heme only	386	0.52
	OVA	387	0.59
60	M8H4DK-wt (rhA1M)	413	1.13
35	M8H4DK-R66H+N17,96D	411	1.11
37	M8H4DK-M41K	415	1.27
38	M8H4DK-R66H	412	1.12
39	M8H4DK-N17,96D	413	1.15
40	M8H-wt	415	1.34
41	M8H-R66H+N17,96D	415	1.41
61	M-wt	386	0.87
42	MR66H+N1796D	387	0.76

C Heme-agarose binding

#	variant	μM bound/ μM protein
	OVA	0.008
60	M8H4DK-wt (rhA1M)	0.71
35	M8H4DK-R66H+N17,96D	0.72
37	M8H4DK-M41K	0.76
38	M8H4DK-R66H	0.66
39	M8H4DK-N17,96D	0.69
40	M8H-wt	0.68
41	M8H-R66H+N17,96D	0.72
61	M-wt	0.68
42	MR66H+N17,96D	0.66

Figure 7

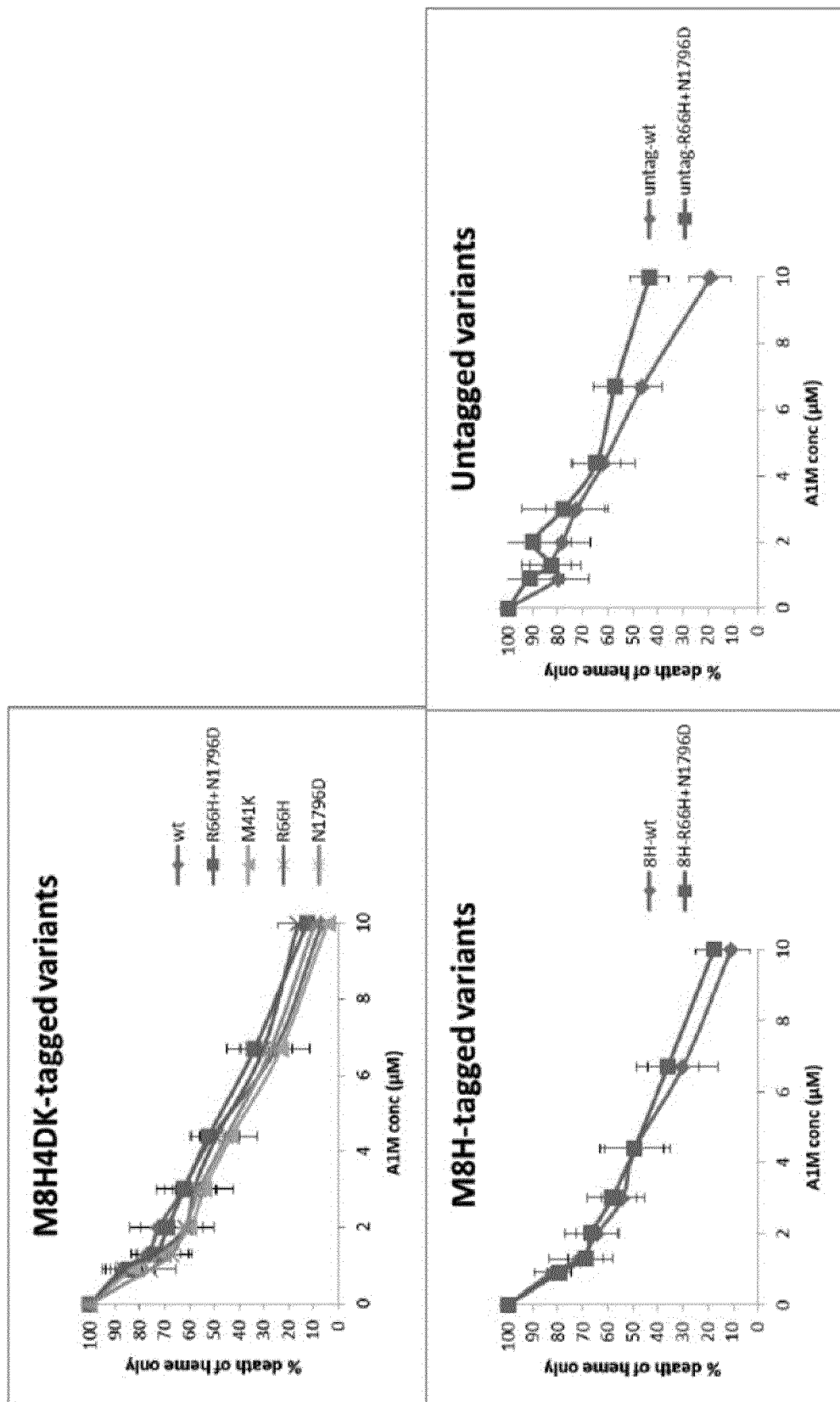


Figure 8

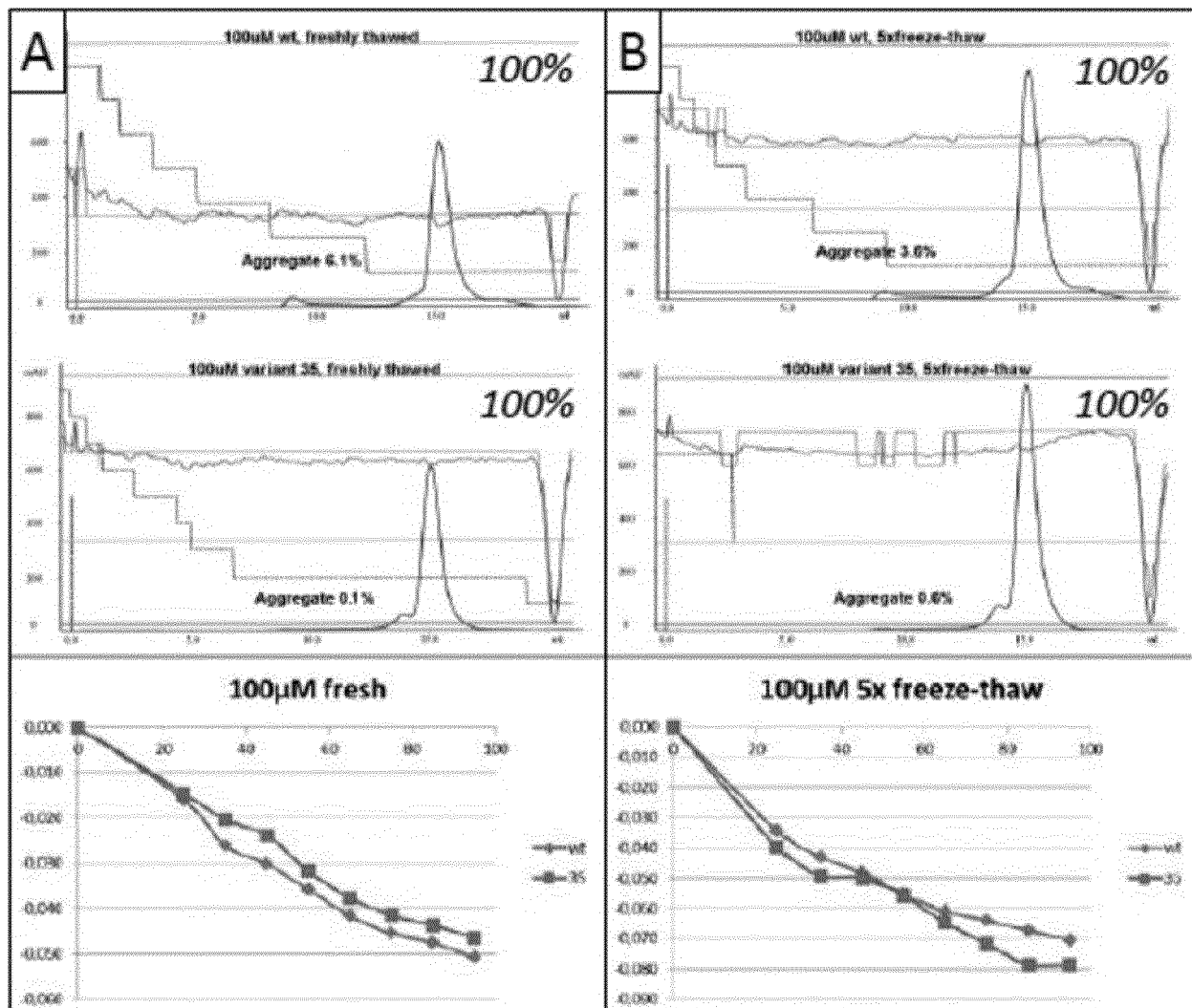


Figure 8 – continued

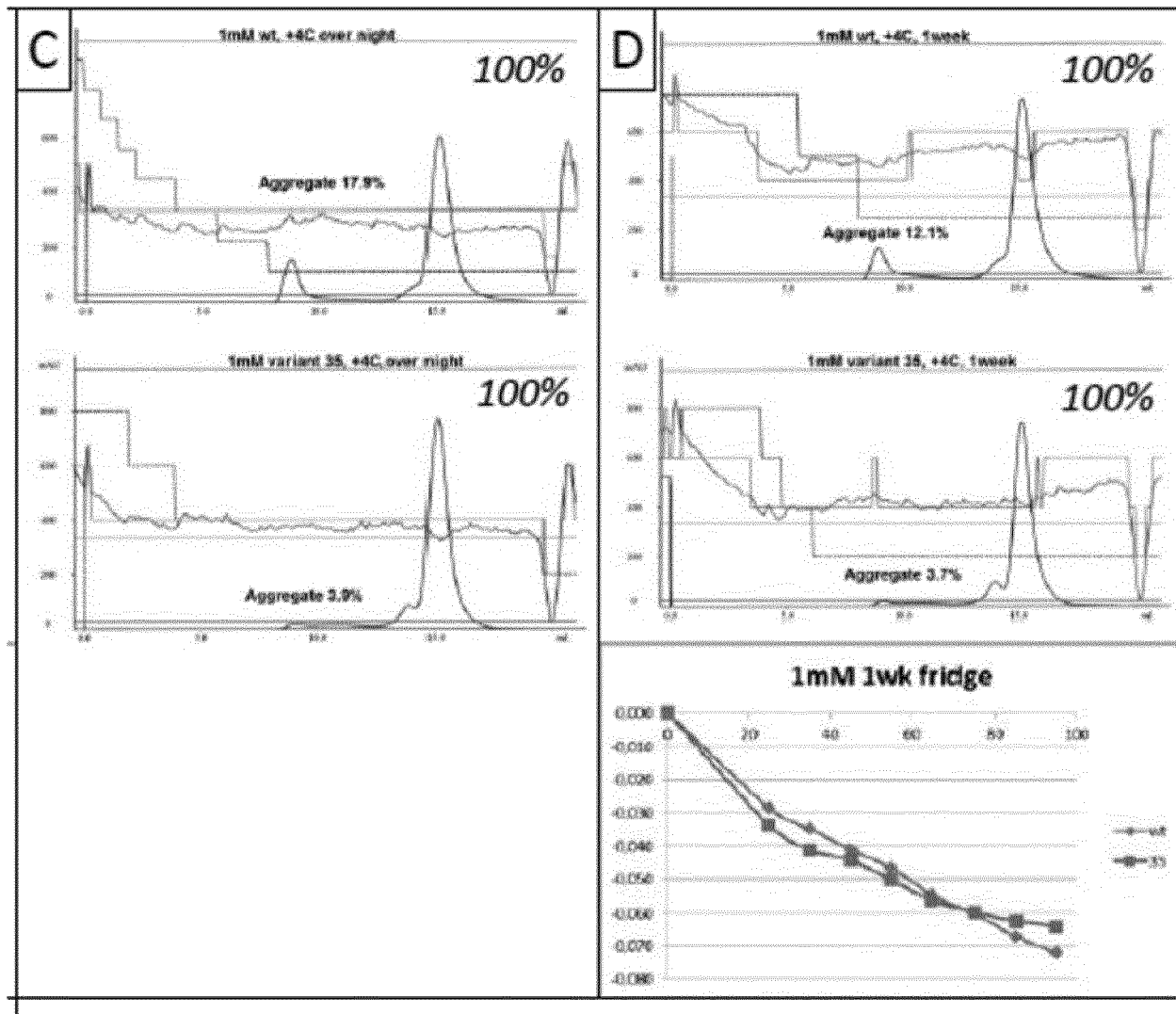


Figure 8 – continued

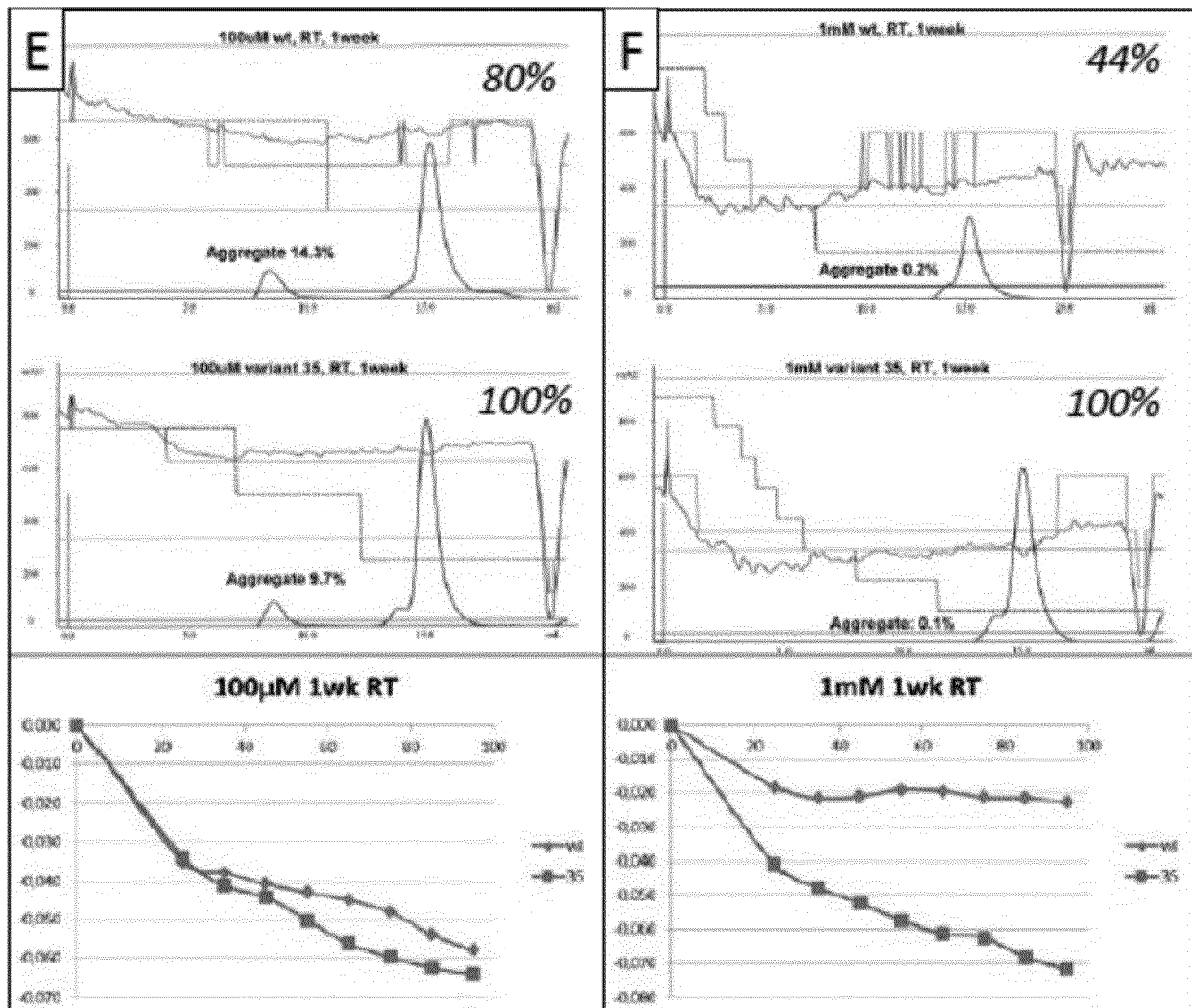


Figure 9

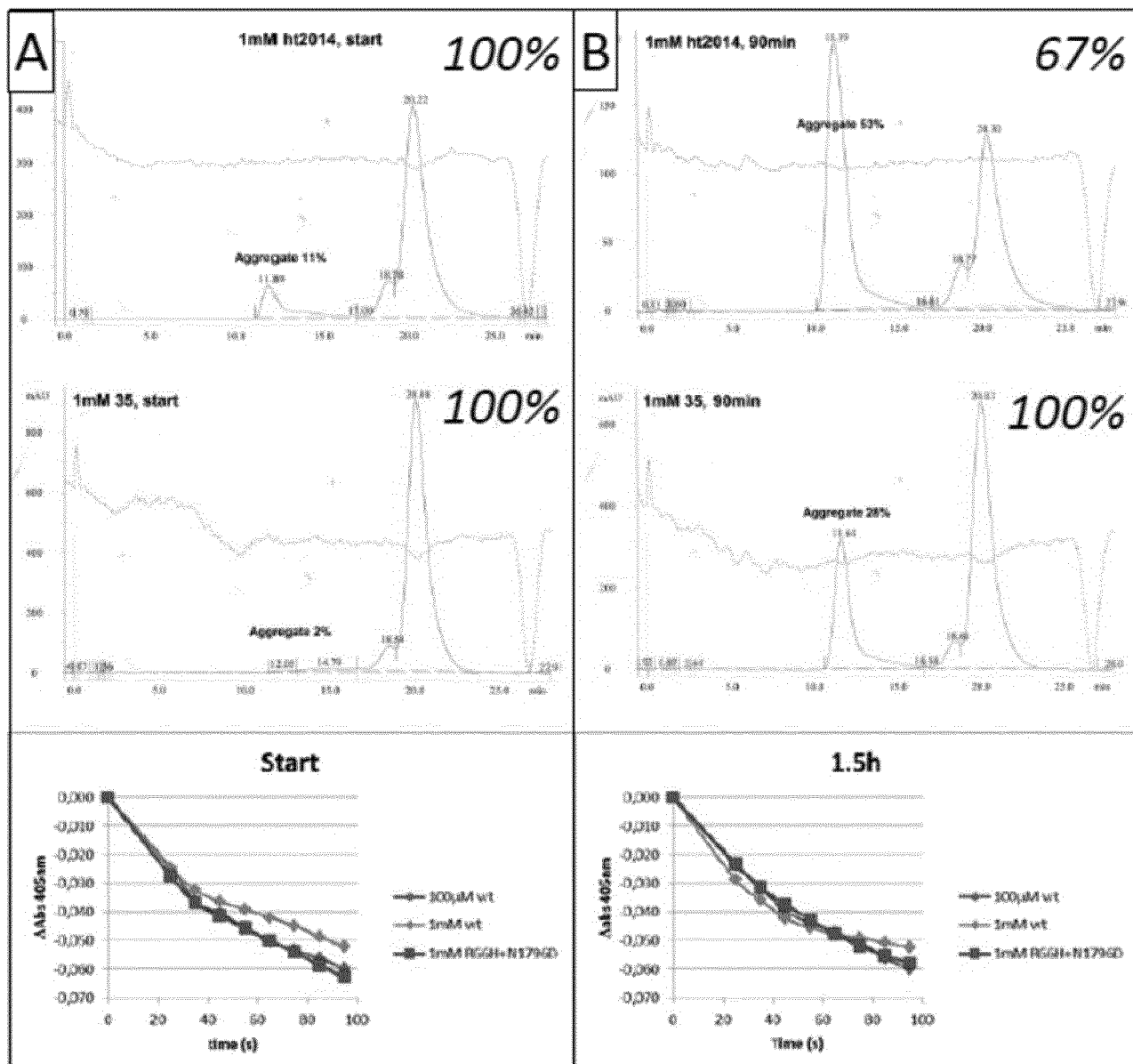


Figure 9 – continued

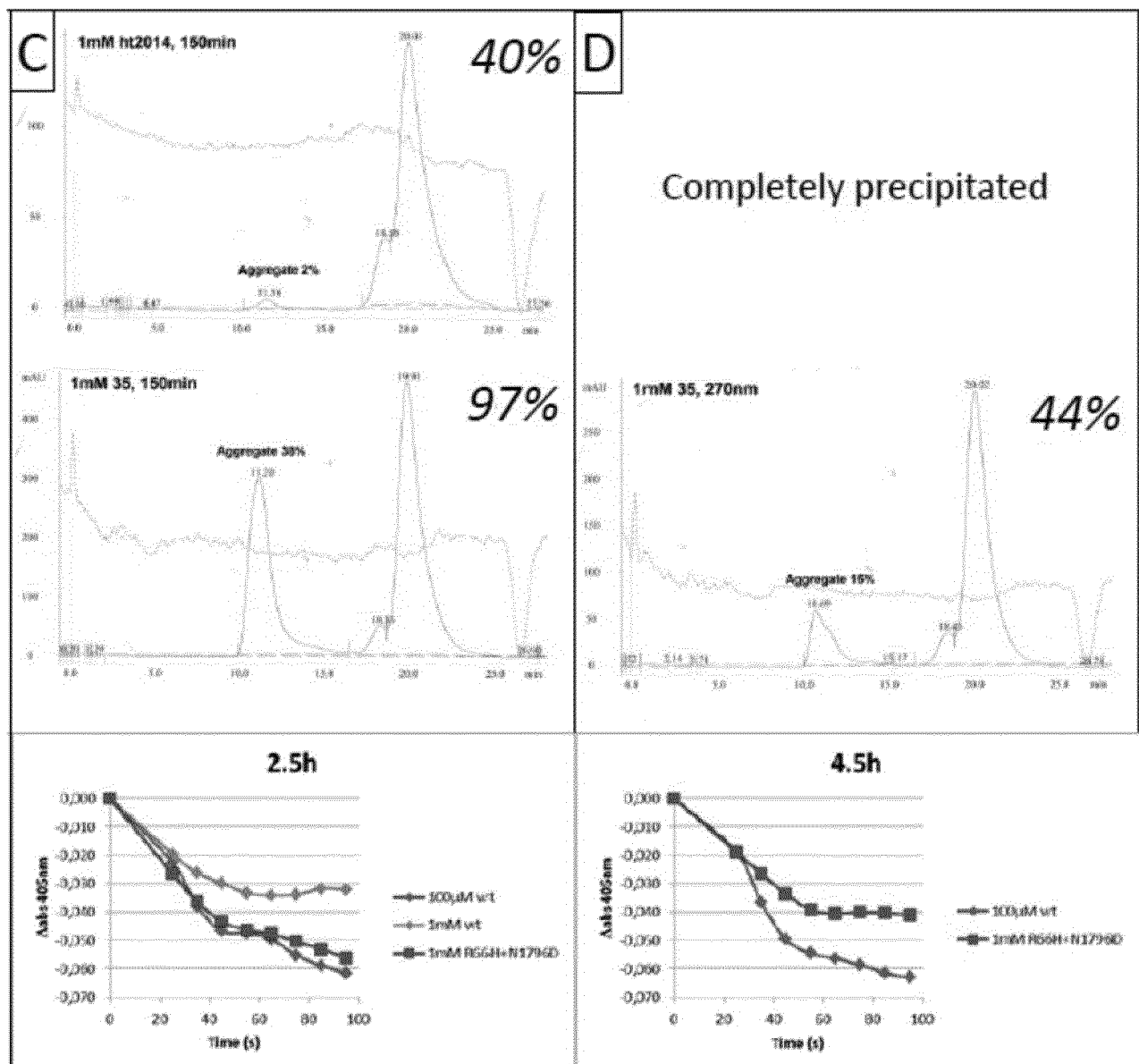


Figure 10

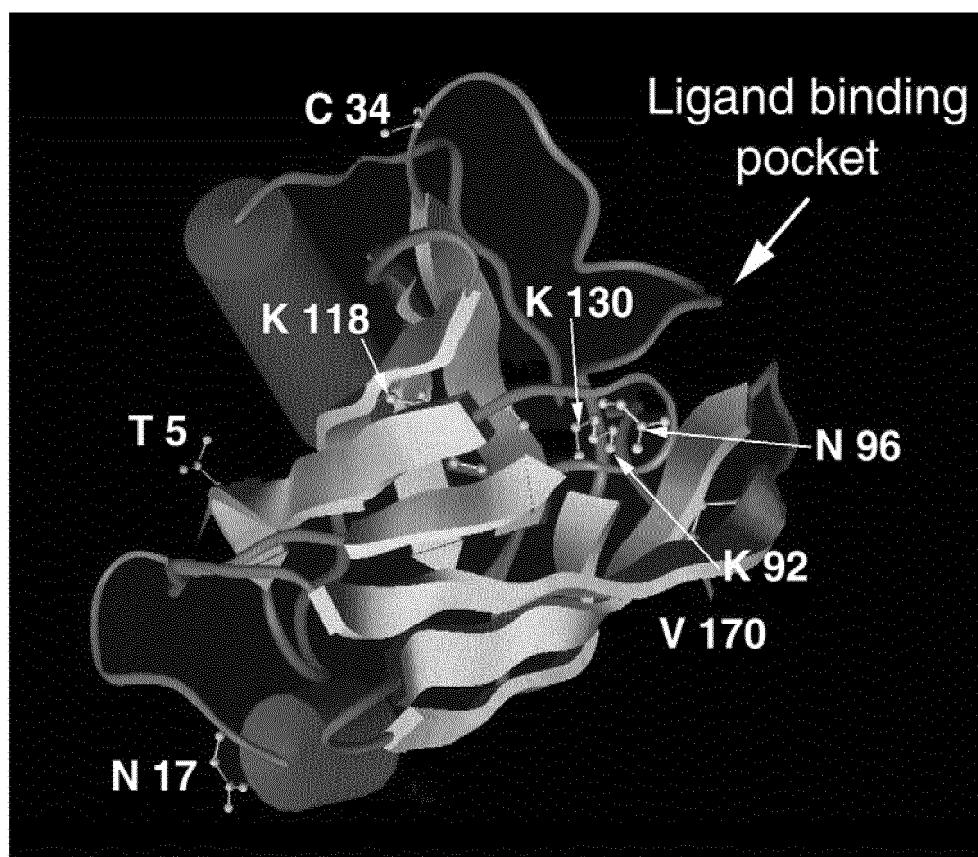


Figure 11

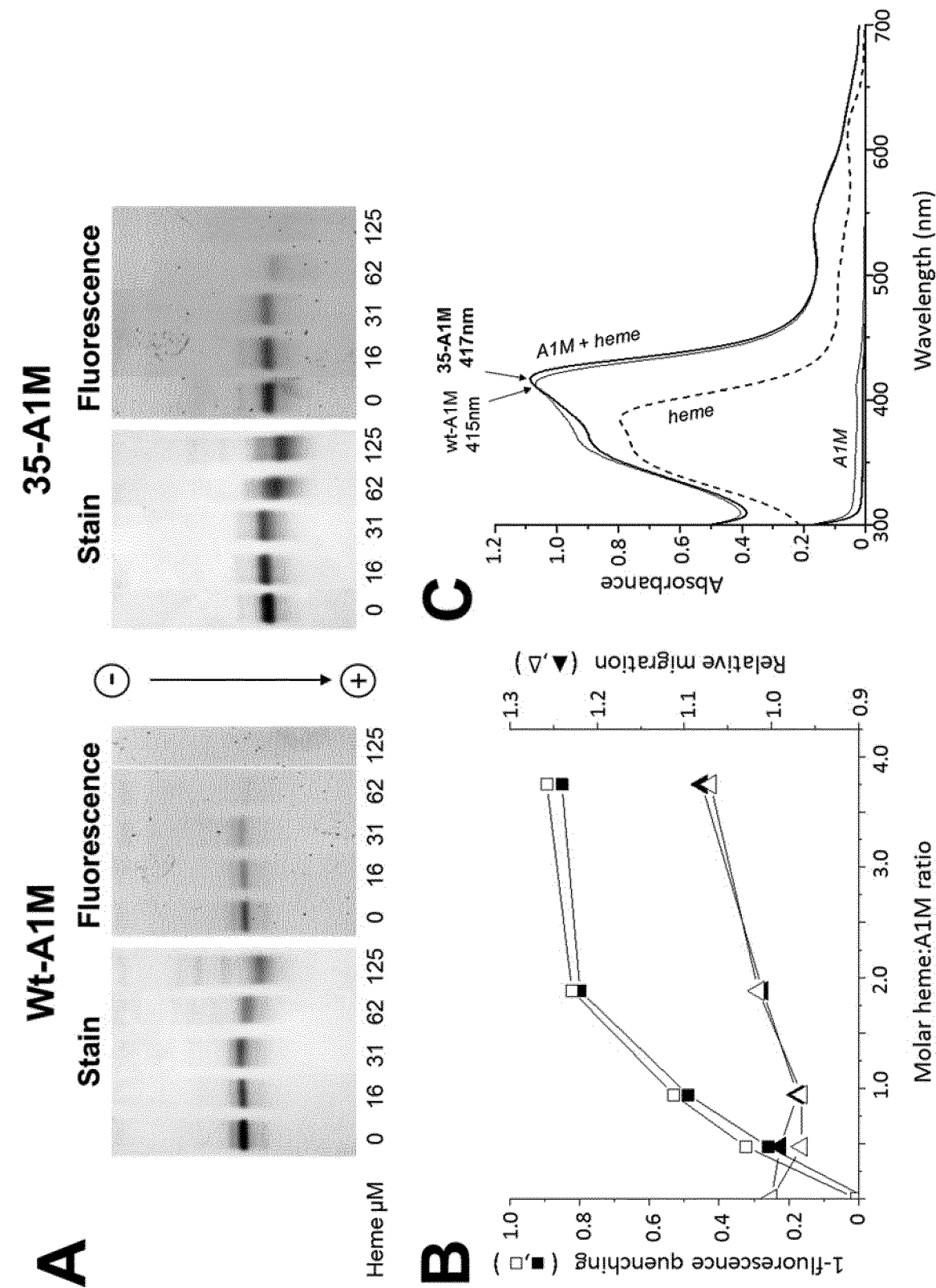


Figure 12

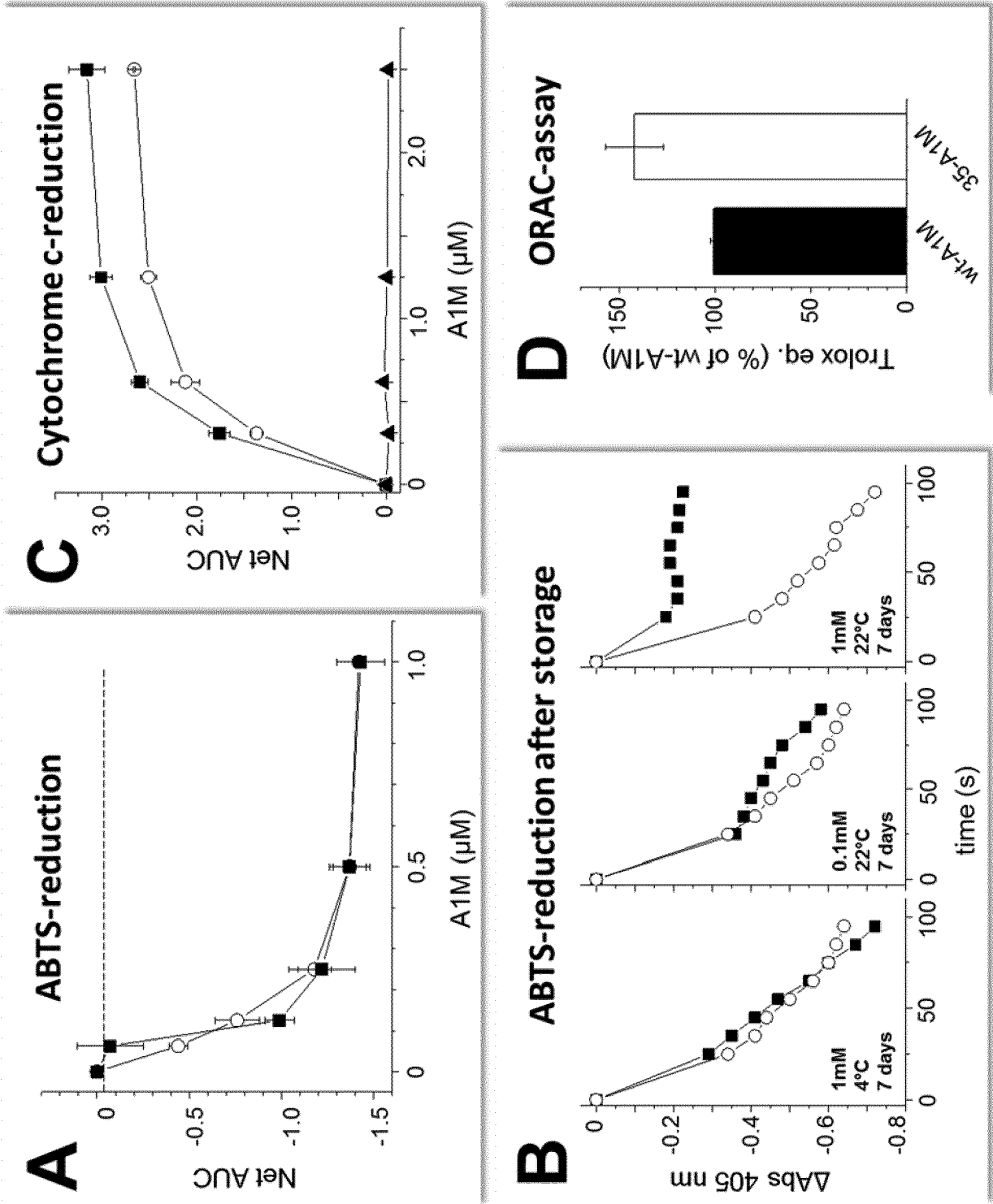


Figure 13

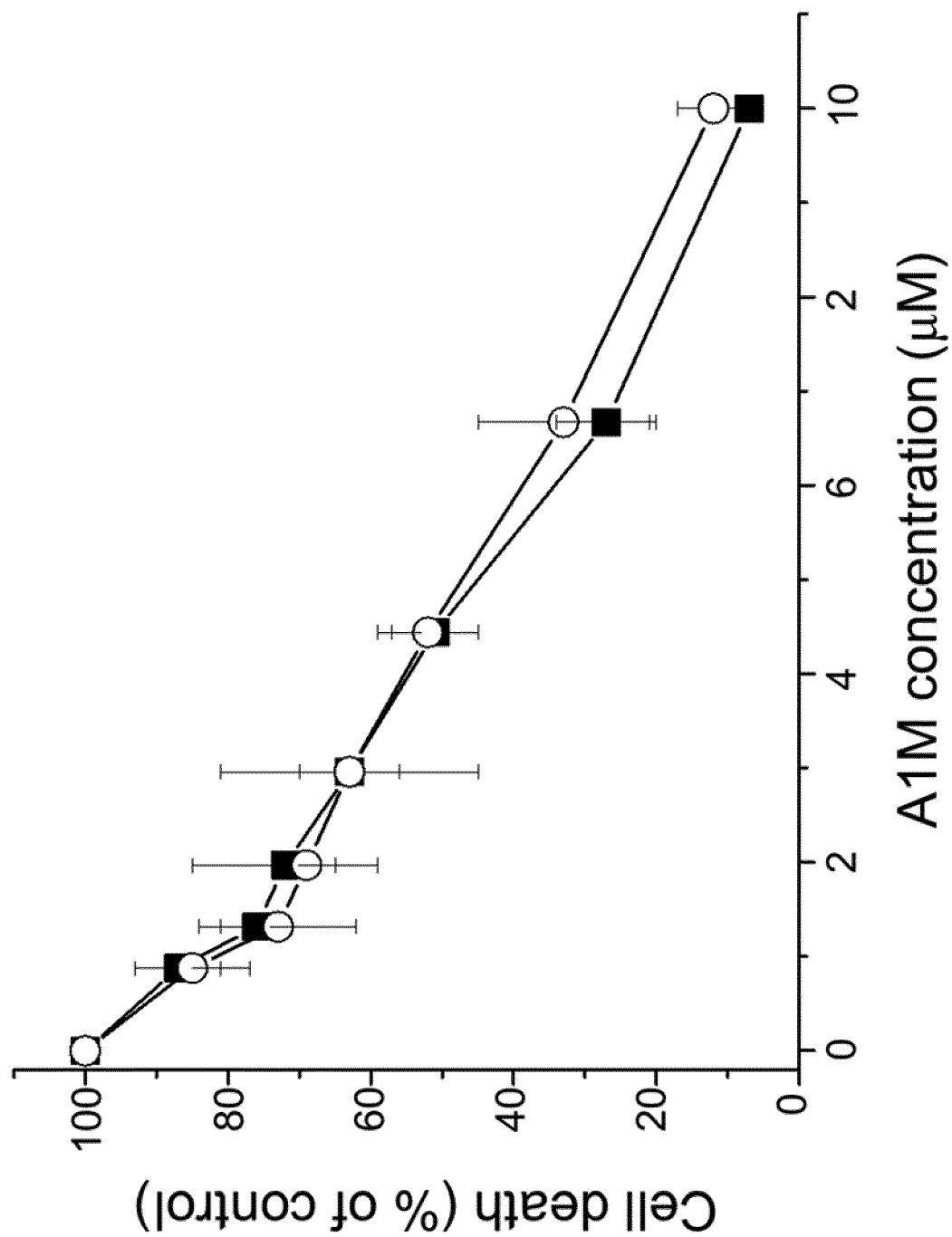


Figure 14

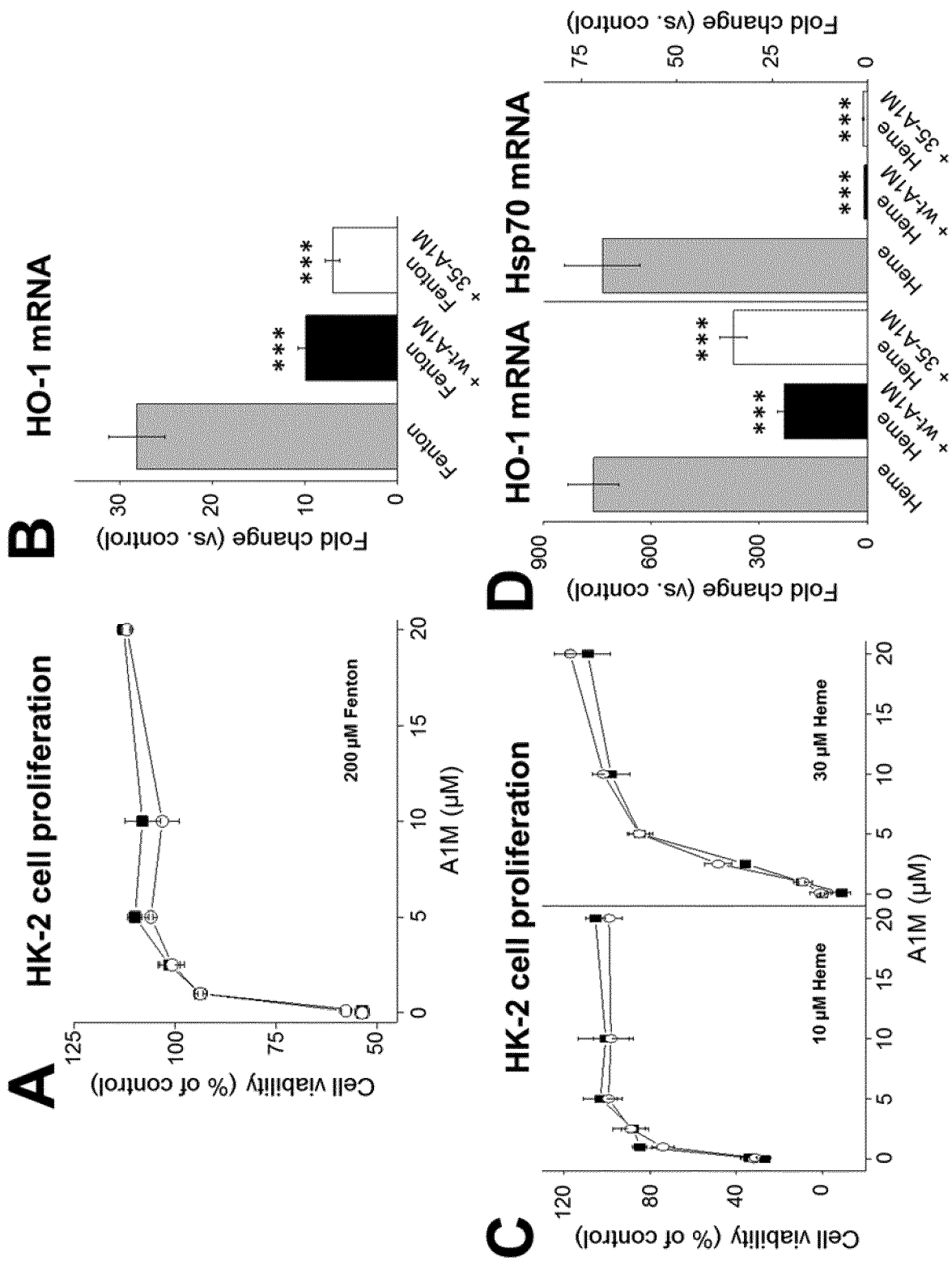


Figure 15

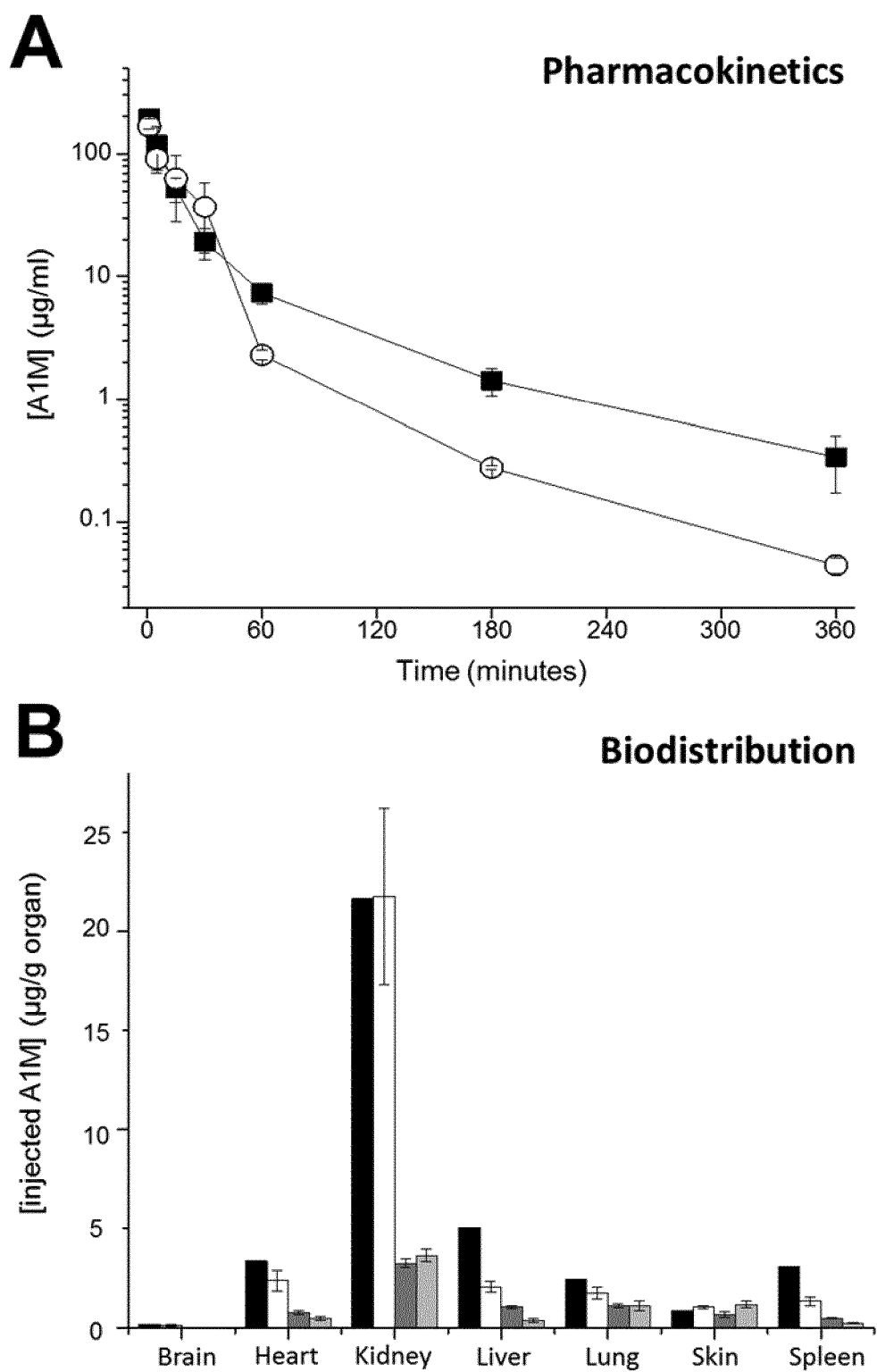


Figure 16

