

PROTEOMICS

Supporting Information for Proteomics

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**Proteomics of human umbilical vein endothelial cells applied to
etoposide-induced apoptosis**

Supplementary Table 1.

PMF and/or LC-ESI-MS/MS sequencing-based identifications of 162 proteins from primary HUVECs. Identifications in *italic* have been reported elsewhere [7]

Cellular location = Csk: cytoskeleton; Cyt: cytoplasm; N: nucleus; M: mitochondria; Mb: membranes; Ly: lysosomes; G: Golgi apparatus; ?: unknown location

Cellular functions = CCM: cytoskeleton and cell motility; CHAP: chaperones; Conta: contamination; Metab: metabolism; STM: signal transduction and membranes; P: proteasome; Adef/detox: anti-oxidant defense and detoxification; ?: unknown function

spot No.	Identification	Access No.	cellular location	main function	Apoptosis	calculated pI	theoretical pI	calculated MW (kDa)	theoretical MW (kDa)
2	Vinculin	P18206	Csk	CCM	target	6.22	5.8	115.05	116.7
12	<i>Glucose regulated protein 94 / GRP94</i>	P14625	ER	CHAP	anti-apoptotic	4.73	4.8	99.27	92.45
17	<i>Valosin-containing protein / CDC48 / p97</i>	P55072	Cyt/N	CHAP	anti-/pro-apoptotic	5.22	5.1	93.70	89.30
35	<i>Glucose regulated protein 78 / GRP78</i>	P11021	ER	CHAP	anti-apoptotic	4.96	5.0	75.40	72.10
36	<i>Glucose regulated protein 78 / GRP78</i>	P11021	ER	CHAP	anti-apoptotic	5.0	5.0	74.95	72.10
40	<i>human serum albumin</i>	P02768	?	Conta	anti-apoptotic	5.40	5.9	73.47	69.35
43	<i>mitochondrial Stress-70 protein (Mortalin) / GRP75</i>	P38646	M	STM	anti-apoptotic	5.55	6.0	72.74	73.76
	<i>mitochondrial HSP 60</i>	P10809	M	CHAP	anti-apoptotic	5.55	5.7	72.74	61.40
45	<i>bovine serum albumin</i>	P02769	?	Conta	anti-apoptotic	5.98	5.8	72.60	69.28
46	Hsp70/Hsp90-organizing protein (hop)	P31948	G, N	CHAP	not related	6.80	6.4	72.45	62.62
47	bovine serum albumin	P02769	?	Conta	anti-apoptotic	5.89	5.8	72.30	69.28
51	bovine serum albumin	P02769	?	Conta	anti-apoptotic	5.81	5.8	71.59	69.28
56	<i>HSP 70 protein 1</i>	P08107	Cyt, M, ER	CHAP	anti-apoptotic	5.53	5.5	69.48	70.03
70	<i>Vimentin</i>	P08670	Csk	CCM	target	5.56	5.0	63.65	53.55

72	Heterogeneous nuclear ribonucleoprotein K	Q07244	N/Cyt	STM	target	5.49	5.4	63.14	50.96
	Protein disulfide isomerase A3 /Erp60 / Erp 57	P30101	ER	CHAP	not related	5.98	6.1	61.53	56.64
79	Dihydropyrimidinase-like 3	4503379	Cyt	Metab	not related	5.98	6.0	61.53	61.90
	Golgi associated PDZ / coiled-coil motif containing protein	9966877	G	STM	not related	5.98	5.6	61.53	50.49
	Tropomyosin 3	24119203	Csk	CCM	target	5.98	4.8	61.53	29.02
85	Tryptophanyl-tRNA synthetase	P23381	Cyt	Metab	not related	6.18	5.8	60.79	53.15
86	Protein disulfide isomerase P55	P07237	ER	CHAP	anti-apoptotic	4.69	4.8	60.67	57.10
90	mitochondrial HSP 60	P10809	M/Cyt	CHAP	anti-/pro-apoptotic	5.30	5.7	60.31	61.04
91	Calreticulin	P27797	ER	CHAP	anti-/pro-apoptotic	4.22	4.3	60.19	48.12
93	Protein disulfide isomerase A3 /Erp60 / Erp 57	P30101	ER	CHAP	not related	5.85	6.0	59.83	56.76
95	Protein disulfide isomerase A3 /Erp60 / Erp 57	P30101	ER	CHAP	not related	5.75	6.0	59.71	56.76
105	Protein disulfide isomerase A3 /Erp60 / Erp 57	P30101	ER	CHAP	not related	5.80	6.0	57.38	56.76
109	Tubulin beta 5 chain	P05218	Csk	CCM	target	4.90	4.8	55.91	49.67
	Tubulin beta 2 chain	P05217	Csk	CCM	target	4.90	4.8	55.91	49.81
118	Vimentin	P08670	Csk	CCM	target	4.73	5.1	53.19	53.67
119	RAB GDP dissociation inhibitor beta	P50395	Cyt	STM	not related	6.35	5.9	53.19	50.65
124	26S proteasome subunit 7	P35998	Cyt/N	P	not related	5.94	5.7	52.77	48.60
	FK506-binding protein 4	4503729	Cyt/N	CHAP	not related	5.94	5.3	52.77	51.77
	Tropomyosin 3	24119203	Csk	CCM	target	5.94	4.8	52.77	29.02
	Dihydroipoamide succinyltransferase	643589	M	Metab	not related	5.94	8.9	52.77	48.55
132	Vimentin	P08670	Csk	CCM	target	4.77	5.0	51.73	53.55
133	Thioredoxin domain containing protein 5 (EndoPDI)	Q8NBS9	ER	CHAP	anti-apoptotic	5.17	5.6	51.73	47.61
134	Thioredoxin domain containing protein 5 (EndoPDI)	Q8NBS9	ER	CHAP	anti-apoptotic	5.23	5.6	51.73	47.61
137	Thioredoxin domain containing protein 5 (EndoPDI)	Q8NBS9	ER	CHAP	anti-apoptotic	5.40	5.6	51.42	47.61
140	Thioredoxin domain containing protein 5 (EndoPDI)	Q8NBS9	ER	CHAP	anti-apoptotic	5.31	5.6	51.01	47.61
146	Vimentin	P08670	Csk	CCM	target	4.68	5.1	50.41	53.67
147	Thioredoxin domain containing protein 5 (EndoPDI)	Q8NBS9	ER	CHAP	anti-apoptotic	5.49	5.6	50.31	47.61
148	Protein disulfide isomerase A6 precursor	Q15084	ER	CHAP	not related	5.08	4.9	50.11	48.12

149	bovine serum albumin	P02769	?	Conta	anti-apoptotic	5.98	5.8	50.11	69.28
152	bovine serum albumin	P02769	?	Conta	anti-apoptotic	5.84	5.8	49.61	69.28
153	Vimentin	P08670	Csk	CCM	target	4.59	5.1	49.31	53.67
164	ER-associated HSP 40 co-chaperone / Erj3	Q9UBS4	ER	CHAP	not related	6.31	5.8	48.15	40.50
180	Thioredoxin domain containing protein 5 (EndoPDI)	Q8NBS9	ER	CHAP	anti-apoptotic	5.63	5.6	45.81	47.61
183	37-kDa laminin receptor precursor / LBP / (p40)	P08865	Cyt/N	CCM	not related	4.67	4.8	45.72	32.84
185	Moesin	P26038	Csk/Mb	CCM	pro-apoptotic	5.72	6.1	45.26	67.80
193	Actin	P02571	Cyt	CCM	target	5.26	5.3	44.10	41.77
194	Actin	P02570	Cyt	CCM	target	5.33	5.3	43.93	41.72
197	Proteinase inhibitor 9	P50453	Cyt	STM	anti-apoptotic	5.76	5.6	43.67	42.39
200	Actin	P02571	Csk	CCM	target	5.40	5.3	43.49	41.77
204	Actin	P02571	Csk	CCM	target	5.85	5.3	43.32	41.77
207	Nucleophosmin	P06748	N/Cyt	STM	anti-apoptotic	4.83	4.6	43.06	32.56
216	Caldesmon	Q05682	Csk	CCM	not related	4.90	5.4	41.63	36.67
217	Actin	P02570	Csk	CCM	target	5.14	5.3	41.63	41.72
219	Actin	P02570	Csk	CCM	target	5.18	5.3	41.38	41.72
222	Nucleophosmin	P06748	N/Cyt	STM	anti-apoptotic	4.77	4.6	41.13	32.56
228	Annexin I	P04083	Cyt/Mb	STM	anti-/pro-apoptotic	6.73	6.6	40.48	38.70
236	Annexin I	P04083	Cyt/Mb	STM	anti-/pro-apoptotic	6.43	6.6	39.84	38.70
246	Actin	P02571	Csk	CCM	target	5.42	5.3	38.74	41.77
248	Actin	P02570	Cyt	CCM	target	5.57	5.3	38.51	41.72
252	Transaldolase	P37837	Cyt	Metab	pro-apoptotic	6.05	6.4	38.13	37.52
258	Tropomyosin fibroblast isoform TM3	P09494	Csk	CCM	not related	4.55	4.7	37.60	32.86
272	F-actin capping protein alpha-1 subunit	P52907	Csk	CCM	target	5.52	5.4	35.99	32.90
273	Thioredoxin related protein	20067392	ER	CHAP	anti-apoptotic	5.08	5.5	35.92	40.67
	Cathepsin Z precursor	3294548	Ly	Metab	not related	5.08	6.7	35.92	33.86
	SEC13-like 1 isoform b	34335134	N/ER	STM	not related	5.08	5.2	35.92	35.52
	Tumor rejection antigen gp 96 / GRP 94 (fragment?)	4507677	ER	CHAP	anti-apoptotic	5.08	4.8	35.92	92.41
Heat shock protein 90-beta (fragment?)	72222	Cyt	CHAP	anti-apoptotic	5.08	5.0	35.92	83.24	

274	<i>Inorganic pyrophosphatase</i>	Q15181	Cyt	Metab	not related	5.64	5.5	35.78	32.66
	<i>L-lactate deshydrogenase</i>	P07195	Cyt	Metab	not related	5.64	5.7	35.78	32.51
275	<i>Annexin V</i>	P08758	Cyt/Mb	STM	anti-apoptotic	5.64	4.9	35.78	35.8
	Annexin III	P12429	Cyt/Mb	STM	not related	5.72	5.6	35.70	36.36
282	Annexin IV	P09525	Cyt/Mb	STM	anti-apoptotic	5.84	5.8	35.28	35.86
283	<i>Tropomyosin 1 alpha chain</i>	P09493	Csk	CCM	not related	4.72	4.7	35.21	32.71
297	Annexin V	P08758	Cyt/Mb	STM	anti-apoptotic	4.89	4.9	33.56	35.92
299	F-actin capping protein beta subunit	P47756	Csk	CCM	target	5.72	5.7	33.43	30.61
	CGI-150 protein	16198390	?	?	not related	5.47	5.4	32.77	33.20
300	14-3-3 epsilon	5803225	Cyt	STM	anti-apoptotic	5.47	4.6	32.77	29.15
	F-actin capping protein beta subunit	1345668	Csk	CCM	target	5.47	5.5	32.77	31.33
307	Proteasome activator PA 28 alpha chain	Q06323	Cyt	P	not related	5.47	5.5	32.77	27.07
	Tropomyosin 4	4507651	Csk	CCM	target	5.47	4.67	32.77	28.50
301	Tropomyosin 3	P12324	Csk	CCM	not related	4.59	4.7	32.71	29.01
	14-3-3 zeta	4507953	Cyt	STM	anti-apoptotic	4.59	4.7	32.71	27.73
309	14-3-3 gamma	5726310	Cyt	STM	anti-apoptotic	4.59	4.6	32.71	28.36
	Hpp ("human protective protein"), chain A, dimer	2098347	Ly	Metab	not related	4.59	6.0	32.71	51.41
313	Dimethylarginine dimethylaminohydrolase 2 (DDAH2)	O95865	Cyt	Metab	anti-/pro-apoptotic	5.75	5.7	31.55	29.63
	Tropomyosin 4	P07226	Csk	CCM	not related	4.47	4.7	31.49	28.50
309	14-3-3 epsilon	5803225	Cyt	STM	anti-apoptotic	4.47	4.6	31.49	29.15
	14-3-3 tau	5803227	Cyt	STM	anti-apoptotic	4.47	4.7	31.49	27.75
313	14-3-3 zeta	4507953	Cyt	STM	anti-apoptotic	4.47	4.7	31.49	27.73
	Hpp ("human protective protein"), chain A, dimer	2098347	Ly	Metab	not related	4.47	6.0	31.49	51.41
315	Proteasome activator PA 28 alpha chain	Q06323	Cyt	P	not related	5.82	5.8	31.05	28.71
316	Proteasome component C2	P25786	Cyt/N	P	not related	6.58	6.1	31.05	29.54
	<i>High mobility group protein 1</i>	P09429	N	STM	anti-apoptotic	6.32	5.6	30.81	24.88
318	Cathepsin B precursor	P07858	Ly	Metab	pro-apoptotic	5.27	5.3	30.56	28.77
321	<i>Prohibitin</i>	P35232	N	STM	pro-apoptotic	5.56	5.6	30.20	29.79
322	Cathepsin D, chain B	494296	Ly	Metab	pro-apoptotic	5.73	5.3	30.20	26.23

327	Cathepsin D, chain B	494296	Ly	Metab	pro-apoptotic	5.33	5.3	29.78	26.23
330	<i>Chloride intracellular channel protein 1</i>	O00299	N/Cyt	STM	not related	5.16	5.0	29.72	26.91
331	<i>Tropomyosin cytoskeletal type</i>	P12324	Csk	CCM	not related	4.64	4.7	29.66	29.01
332	bovine mammalian 20 S proteasome	21465650	?	Conta	not related	5.96	5.8	29.66	25.31
334	Cathepsin D, chain B	494296	Ly	Metab	pro-apoptotic	5.38	5.3	29.6	26.23
336	14-3-3 zeta/delta	P29312	Cyt	STM	anti-apoptotic	4.57	4.7	29.54	27.73
	intracellular chloride channel p64H1	4588524	Mb	STM	not related	5.44	5.4	29.37	28.6
	Chloride intracellular channel protein 2	O15247	N/Cyt	STM	not related	5.44	5.6	29.37	28.27
338	14-3-3 epsilon	5803225	Cyt	STM	anti-apoptotic	5.44	4.6	29.37	29.15
	Cathepsin B precursor (Cathepsin B1)	115711	Ly	Metab	pro-apoptotic	5.44	5.9	29.37	37.78
	Tropomyosin 4	4507651	Csk	CCM	not related	5.44	4.7	29.37	28.50
342	Ran-specific GTP ase-activating protein	P43487	N/Cyt	STM	not related	5.19	5.2	29.13	23.29
346	PAF acetylhydrolase, isoform lb, beta subunit	Q29459	Cyt	Metab	not related	5.76	5.5	28.79	25.55
	Thioredoxin peroxidase (peroxiredoxin)	5453549	Cyt	Adef/detox	anti-apoptotic	5.76	5.9	28.79	30.52
347	Enoyl-CoA hydratase	P30084	M	Metab	not related	6.15	8.9	28.79	31.35
	N-acetyl-beta-glucosaminidase prepro polypeptide	179462	Ly	Metab	not related	5.25	7.0	28.73	64.32
	Tumor protein D52-like 2 isoform	40805868	?	STM	not related	5.25	5.3	28.73	23.77
348	Proteasome alpha 3 subunit isoform 1	4506183	Cyt	P	not related	5.25	5.2	28.73	28.41
	F-actin capping protein beta subunit	4826659	Csk	CCM	target	5.25	5.7	28.73	30.61
	intracellular chloride channel p64H1	4588524	Mb	STM	not related	5.25	5.4	28.73	28.60
352	<i>Endoplasmic reticulum protein Erp29</i>	P30040	ER	CHAP	not related	6.30	6.8	28.39	28.98
354	<i>Rho GDP dissociation inhibitor 1</i>	P52565	Cyt	CCM	anti-apoptotic	4.97	5.0	28.05	23.19
356	Rho GDP dissociation inhibitor 2 /D4GDI	P52566	Cyt	CCM	target	5.10	5.1	27.88	22.97
358	Proteasome component C8	P25788	Cyt/N	P	not related	5.15	5.2	27.83	28.42
361	Thioredoxin peroxidase	5453549	Cyt	Adef/detox	anti-apoptotic	5.79	5.9	27.77	30.52
	Endopeptidase Clp precursor	5174419	M	Metab	not related	5.79	8.3	27.77	30.16
365	<i>Heat shock protein 27</i>	P04792	Cyt	CCM	anti-apoptotic	6.20	6.0	27.28	22.78
376	<i>Heat shock protein 27</i>	P04792	Cyt	CCM	anti-apoptotic	5.66	6.0	26.37	22.78
381	Proteasome beta-subunit	631345	Cyt	P	not related	6.06	5.7	25.80	25.89

	DIP-inositol polyP phosphohydrolase 2 alpha	7739464	Cyt	Metab	not related	6.06	6.0	25.80	20.29
	glyoxalase I	Q04760	Cyt	Adef/detox	anti-apoptotic	4.95	5.1	25.54	20.76
384	SET protein (phosphatase 2A inhibitor I2PP2A)	1711383	N	STM	not related	4.95	4.12	25.54	32.08
390	P23 histamin releasing factor	P13693	Cyt	CHAP	anti-apoptotic	4.76	4.8	25.19	19.58
394	Proteasome beta chain precursor	P28070	Cyt/N	P	not related	5.71	5.7	24.94	29.17
396	<i>Ubiquitin carboxyl terminal hydrolase isozyme L1</i>	P09936	Cyt	P	not related	5.48	5.3	24.79	24.83
409	<i>Hemoglobin gamma (38)</i>	P02096	?	Conta	anti-apoptotic	5.48	6.7	24.79	16.00
409	bovine apolipoprotein A-I	P15497	?	Conta	anti-apoptotic	5.36	5.7	24.16	30.26
416	<i>RNA binding protein regulatory subunit (DJ1)</i>	6005749	Cyt/N	CHAP	anti-apoptotic	6.37	6.3	23.59	19.83
425	<i>Glutathione S-transferase</i>	P09211	Cyt	Adef/detox	anti-apoptotic	5.63	5.4	23.17	23.34
434	ATP synthase, H+ transporting	5453559	M	Metab	pro-apoptotic	5.22	5.2	22.13	18.47
435	Sorcin	P30626	Cyt	STM	not related	5.09	5.3	21.95	21.66
436	<i>Thioredoxin peroxidase 1 (peroxiredoxin 2)</i>	P32119	Cyt	Adef/detox	anti-apoptotic	5.59	5.7	21.91	21.87
441	<i>Cofilin non-muscle isoform (acidic isoform)</i>	P23528	Cyt/N	CCM	anti-apoptotic	6.43	8.5	21.48	18.48
444	<i>Hemoglobin alpha</i>	P01922	?	Conta	anti-apoptotic	6.43	8.7	21.48	15.13
444	Adenine phosphoribosyltransferase	P07741	Cyt	Metab	not related	5.53	5.8	21.26	19.59
450	Rho (Ras homology)-A GDP complex (inactive form)	2981782	Cyt	STM	anti-apoptotic	5.89	5.8	20.8	21.72
453	<i>Nucleoside diphosphate kinase A (nm23-H1)</i>	P15531	Cyt/N	Metab	pro-apoptotic	5.98	5.8	20.27	17.13
456	<i>Prefoldin subunit 5 (C-myc binding protein Mm-1)</i>	Q99471	Cyt	CHAP	not related	5.98	5.9	20.27	17.33
471	Stathmin 1, p18	5031851	Cyt	CCM	not related	5.81	5.8	19.83	17.29
481	Ubiquitin-conjugating enzyme	Q16781	Cyt	P	not related	6.07	6.1	18.46	17.12
481	<i>Fatty acid-binding protein</i>	Q01469	Cyt	Metab	not related	6.38	6.6	17.46	15.15
498	Fatty acid-binding protein	P15090	Cyt	Metab	not related	6.19	6.6	16.31	14.70
506	Phosphohistidine phosphatase	Q9NRX4	Cyt	Metab	not related	5.59	5.7	15.74	13.81
508	<i>Galectin-1</i>	P09382	Cyt	STM	pro-apoptotic	5.04	5.3	15.64	14.70
509	Transthyretin precursor	136468	?	Conta	not related	6.54	5.6	15.64	15.76
512	Tubulin-specific chaperone A	O75347	Cyt	CCM	not related	5.20	5.3	15.46	12.84
517	SH3 domain binding glutamic acid-rich protein like	O75368	N/Cyt	Metab	not related	5.28	5.2	14.97	12.76
524	t-complex-associated-testis-expressed 1-like 1	5730085	Cyt	CCM	not related	4.86	5.0	14.65	12.44

528	Calgizzarin (S100C / S100A11 protein)	P31949	Cyt/N	STM	not related	6.14	6.6	14.30	11.72
533	Myotrophin	21956645	Cyt	STM	anti-apoptotic	5.09	5.3	14.05	12.89
551	Calcyclin (S100A6 protein)	P06703	Cyt	STM	not related	5.10	5.3	12.36	10.16