

# Mitochondrial HSP70 Chaperone System – the Influence of Post-translational Modifications and Involvement in Human Diseases

Havalová H., *et al.*

## Supplementary Table S1

**Table S1.** The overview of mortalin post-translational modifications and their involvement in human diseases, which appear in the PhosphositePlus® Database. Only modifications identified by at least five separate proteomic studies are listed.

Modification	Position	Localization in domain structure	Diseases	Tissue
Phosphorylation	S3	MTS	breast cancer [1]	MCF10A1 (EP) [1], MCF10AT1K (EP) [1], MCF10CA1a (EP) [1], MCF10CA1h (EP) [1]
	S5	MTS	breast cancer [1]	MCF10A1 (EP) [1], MCF10AT1K (EP) [1], MCF10CA1a (EP) [1], MCF10CA1h (EP) [1]
	T22	MTS	breast cancer [1]	MCF10A1 (EP) [1], MCF10AT1K (EP) [1], MCF10CA1a (EP) [1], MCF10CA1h (EP) [1]
	S29	MTS	breast cancer [2]	breast [2], Jurkat (TL) [3]
	Y46	MTS	lung cancer [4]	CL1-5 (PL) [4]
	T87	NBD	lung cancer [5]	DMS153 (PL), K562 (ERT) [6], lung [5], NCI-H1437 (PL), NCI-H2073 (PL), NCI-H209 (PL), NCI-H838 (PL)
	Y128	NBD	gastric cancer, leukemia, chronic myelogenous leukemia, lung cancer	A549 (PL), Cal-12T (PL), DMS153 (PL), HCC15 (PL), HCC44 (PL), HCC78 (PL), K562 (ERT), LOU-NH91 (SQ), lung, MKN-45 (GAS), NCI-H1299 (PL), NCI-H1355 (PL), NCI-H1437 (PL), NCI-H1666 (PL), NCI-H1703 (SQ), NCI-H1734 (PL), NCI-H1781 (PL), NCI-H1792 (PL), NCI-H1944 (PL), NCI-H2073 (PL), NCI-H209 (PL), NCI-H2228 (PL), NCI-H23 (PL), NCI-H2342 (PL), NCI-H2405 (PL), NCI-H3122 (PL), NCI-H3255 (PL), NCI-H358 (PL), NCI-H441 (PL), NCI-H460 (PL), NCI-H661 (PL), NCI-H838 (PL)

S148	NBD	breast cancer [2,7]	breast [2], BT-549 (BC) [7] , MDA-MB-231 (BC) [7]
S162	NBD	lung cancer [8]	Jurkat (TL) [3], K562 (ERT) [6], PC9 (PL) [8], PC9-IR (PL) [8]
S164	NBD	breast cancer [2], lung cancer [8]	breast [2], Jurkat (TL), PC9-IR (PL) [8]
S200	NBD	breast cancer [2]	breast [2], HEK293T (EP) [9], HeLa (CER) [10,11], Jurkat (TL)
T271	NBD	lung cancer	A549 (PL), Cal-12T (PL), Calu-3 (PL), DMS153 (PL), DMS53 (PL), HCC15 (PL), HCC44 (PL), HCC78 (PL), HCC827 (PL), LOU-NH91 (SQ), lung, NCI-H1299 (PL), NCI-H1355 (PL), NCI-H1437 (PL), NCI-H1650 (PL), NCI-H1666 (PL), NCI-H1703 (SQ), NCI-H1734 (PL), NCI-H1781 (PL), NCI-H1792 (PL), NCI-H1944 (PL), NCI-H1975 (PL), NCI-H2073 (PL), NCI-H209 (PL), NCI-H2106 (PL), NCI-H2228 (PL), NCI-H23 (PL), NCI-H2342 (PL), NCI-H2405 (PL), NCI-H3122 (PL), NCI-H358 (PL), NCI-H441 (PL), NCI-H446 (PL), NCI-H460 (PL), NCI-H526 (PL), NCI-H661 (PL), NCI-H69 (PL), NCI-H82 (PL), NCI-H838 (PL)
S378	NBD	erythroid leukemia [12], acute myeloblastic leukemia [12], lung cancer, B cell lymphoma [12], non-Hodgkin's lymphoma [12], multiple myeloma [12]	AML-193 (MN) [12], CMK (MGK) [12], CTS (MYE) [12], DOHH2 (BL, precursor) [12], HEL (ERT) [12], HeLa (CER) [10], Kasumi-1 (MYE) [12], KG-1 (MYE) [12], lung , MV4-11 (MP) [12], OPM-2 (PC) [12], P31/FUJ (ERT) [12], RL (BL, precursor) [12], RPMI-8266 (PC) [12], SU-DHL-6 (BL) [12], U266 (PC) [12], Vero E6-S (EP, KD) [13]
S408	NBD	breast cancer [2]	breast [2], HeLa (CER) [11], K562 (ERT) [6]
Y568	SBD	cervical cancer [14], gastric cancer, leukemia, chronic myelogenous leukemia, liver	DMS153 (PL), HCC15 (PL), HCC78 (PL), HeLa S3 (CER) [14], K562 (ERT), liver, LOU-NH91 (SQ), lung, NCI-H1437 (PL), NCI-H1703 (SQ), NCI-H1781 (PL), NCI-H2073 (PL), NCI-H209 (PL),

			cancer, hepatocellular carcinoma, lung cancer	NCI-H2228 (PL), NCI-H2342 (PL), NCI-H3122 (PL), NCI-H661 (PL), NCI-H838 (PL), stomach
	S627	SBD	breast cancer [2], melanoma skin cancer [15]	breast [2], MCF-7 (BC), WM239A (MEL) [15]
<b>Mono- methylation</b>	R513	SBD	gastric cancer, lung cancer	293 (EP) [16], A549 (PL), Cal-12T (PL), Calu-3 (PL), DMS153 (PL), DMS53 (PL), HCC15 (PL), HCC44 (PL), HCC78 (PL), HCC827 (PL), HCT116 (INT) [17], Jurkat (TL) [18], LOU-NH91 (SQ), lung, MKN-45 (GAS), NCI-H1299 (PL), NCI-H1355 (PL), NCI- H1437 (PL), NCI-H1650 (PL), NCI-H1666 (PL), NCI-H1703 (SQ), NCI-H1734 (PL), NCI- H1781 (PL), NCI-H1792 (PL), NCI-H1944 (PL), NCI-H1975 (PL), NCI-H2073 (PL), NCI-H209 (PL), NCI-H2106 (PL), NCI- H2228 (PL), NCI-H23 (PL), NCI- H2342 (PL), NCI-H2405 (PL), NCI-H3122 (PL), NCI-H3255 (PL), NCI-H358 (PL), NCI-H441 (PL), NCI-H446 (PL), NCI-H460 (PL), NCI-H526 (PL), NCI-H661 (PL), NCI-H69 (PL), NCI-H82 (PL), NCI-H838 (PL), TL [18]
<b>Acetylation</b>	K121	NBD	lung cancer, B cell lymphoma	NCI-H2228 (PL), RC-K8 (BL)
	K135	NBD	colorectal cancer, leukemia, chronic myelogenous leukemia, liver cancer, hepatocellular carcinoma, lung cancer [19]	A549 (PL) [19,20], HCT116 (INT), HeLa (CER) [21], HepG2 (HP), Jurkat (TL) [3,20], K562 (ERT), liver [22], MV4-11 (MP) [20], RC- K8 (BL)
	K138	NBD	leukemia, chronic myelogenous leukemia, lung cancer [19]	A549 (PL) [19,20], HeLa (CER) [21], Jurkat (TL) [3,20], K562 (ERT)
	K159	NBD	colorectal cancer, gastric cancer, leukemia, chronic	HCT116 (INT), HeLa (CER) [21], K562 (ERT), MKN-45 (gastric),

		myelogenous leukemia, lung cancer	NCI-H1703 (SQ), NCI-H2228 (PL)
K206	NBD	not found	HeLa (CER) [21], Jurkat (TL) [3]
K288	NBD	colorectal cancer, leukemia, chronic myelogenous leukemia, liver cancer, lung cancer [19], ventricular tachycardia	A549 (PL) [19,20], cardiac-heart, HCT116 (INT), HCT8/S11 (INT), HT-29 (INT), Jurkat (TL) [3,20], K562 (ERT), liver [22], MV4-11 (MP) [20], NCI-H2228 (PL), NCI-H716 (INT), OCI-ly3 (BL), RC-K8 (BL), SEM (BL), SNU-C2B (INT), SW480 (INT), SW620 (INT), UOK-101 (REN)
K291	NBD	ventricular tachycardia	cardiac-heart
K300	NBD	colorectal cancer, leukemia, chronic myelogenous leukemia, liver cancer, hepatocellular carcinoma, lung cancer [19]	A549 (PL) [19,20], HCT116 (INT), HeLa (CER) [21], HepG2 (HP), Jurkat (TL) [3], K562 (ERT)
K345	NBD	gastric cancer, lung cancer [19]	A549 (PL) [19], DMS79 (PL), Jurkat (TL) [20], lung, MKN-45 (GAS), NCI-H128 (PL), NCI-H1299 (PL), NCI-H1417 (PL), NCI-H1703 (SQ), NCI-H1734 (PL), NCI-H1944 (PL), NCI-H209 (PL), NCI-H358 (PL), NCI-H460 (PL), NCI-H524 (PL)
K567	SBD	colorectal cancer, leukemia, chronic myelogenous leukemia, lung cancer	A549 (PL) [20], Cal-12T (PL), Calu-3 (PL), DMS153 (PL), DMS53 (PL), DMS79 (PL), HCC15 (PL), HCC44 (PL), HCC827 (PL), HCT116 (INT), HeLa (CER) [21], Jurkat (TL) [3,20], K562 (ERT), LOU-NH91 (SQ), lung, MV4-11 (MP) [20], NCI-H128 (PL), NCI-H1299 (PL), NCI-H1355 (PL), NCI-H1417 (PL), NCI-H1437 (PL), NCI-H1650 (PL), NCI-H1666 (PL), NCI-H1703 (SQ), NCI-H1734 (PL), NCI-H1792 (PL), NCI-H1944 (PL), NCI-H1975 (PL), NCI-H2073 (PL), NCI-H209 (PL),

			NCI-H2106 (PL), NCI-H2228 (PL), NCI-H23 (PL), NCI-H2342 (PL), NCI-H2405 (PL), NCI-H3255 (PL), NCI-H358 (PL), NCI-H441 (PL), NCI-H446 (PL), NCI-H460 (PL), NCI-H524 (PL), NCI-H526 (PL), NCI-H69 (PL), NCI-H82 (PL), NCI-H838 (PL)	
	K600	SBD	liver cancer, lung cancer [19]	A549 (PL) [19], HeLa (CER) [21], Jurkat (TL) [3], K562 (ERT), liver
	K612	SBD	colorectal cancer, leukemia, chronic myelogenous leukemia, lung cancer [19]	A549 (PL) [19], HCT116 (INT), Jurkat (TL) [3], K562 (ERT)
	K646	SBD	gastric cancer, lung cancer	A549 (PL) [20], lung, MKN-45 (GAS), NCI-H1299 (PL), NCI-H1703 (SQ), NCI-H1734 (PL), NCI-H1944 (PL), NCI-H358 (PL), NCI-H460 (PL), RC-K8 (BL)
	K675	SBD	leukemia, chronic myelogenous leukemia	K562 (ERT)
	K678	SBD	kidney cancer, leukemia, chronic myelogenous leukemia	K562 (ERT)
Ubiquitylation	K121	NBD	multiple myeloma	HEp-2 (SQ) [23], Jurkat (TL) [3,24], RPMI-8266 (PC)

#### Abbreviations

BL	B lymphocyte
BC	breast cell
CER	cervical
EP	epithelial
ERT	erythroid
GAS	gastric
HP	hepatic
INT	intestinal
KD	kidney
MP	macrophage
MGK	megakaryoblast
MEL	melanocyte
MN	monocyte
MYE	myeloid
PC	plasma cell

PL	pulmonary
REN	renal
SQ	squamous
TL	T lymphocyte

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