Table S1

Function and subcellular location of the chaperones that share immunogenic peptides with SARS-COV2 (source Uniprot)

Human Protein (HP)	**Heat shock 70 kDa protein 13**
Gene and alternative name(s)	*HSPA13*, Microsomal stress-70 protein ATPase core
UniProt Identifier HP	P48723
HP Epitope	6-**TILGSA**-11
Viral Protein (VP)	Replicase polyprotein 1ab
UniProt Identifier VP	P0DTD1
Viral Epitope	3543-**TILGSA**-3548
IEBD	**TILGSA**LLEDEFTPF
HP description	Chaperone, has peptide-independent ATPase activity
HP functions	• ATPase activity • heat shock protein binding • misfolded protein binding • protein folding chaperone • unfolded protein binding
HP biological processes	• cellular response to unfolded protein • chaperone cofactor-dependent protein refolding • protein refolding • vesicle-mediated transport
HP subcellular location	• Microsome • Endoplasmic reticulum
HP tissue specificity	Constitutively expressed in all tissues
References	-
Human Protein (HP)	**Heat shock 70 kDa protein 4**
Gene and alternative name(s)	*HSPA4*, HSP70RY, Heat shock 70-related protein APG-2
UniProt Identifier HP	P34932
HP Epitope	452-**LPYPDP**-457
Viral Protein (VP)	Replicase polyprotein 1ab
UniProt Identifier VP	P0DTD1
Viral Epitope	5221-**LPYPDP**-5226
IEBD	DDYVY**LPYPDP**SRI
HP description	Chaperone, Stress protein
HP functions	ATP binding
HP biological processes	• chaperone-mediated protein complex assembly • protein insertion into mitochondrial outer membrane • response to unfolded protein • Stress response
HP subcellular location	Cytoplasm
HP tissue specificity	Expressed in all tissues
References	-
Human Protein (HP)	**Heat shock 70 kDa protein 4L**
Gene and alternative name(s)	*HSPA4L*, Heat shock 70-related protein APG-1, Osmotic stress protein 94
UniProt Identifier HP	O95757
HP Epitope	636-**GTVYEK**-641
Viral Protein (VP)	Replicase polyprotein 1ab
UniProt Identifier VP	P0DTD1
Viral Epitope	618-**GTVYEK**-623
IEBD	NIF**GTVYEK**L
HP description	Chaperone, Stress protein (1)
HP functions	ATP binding

HP biological processes	• response to unfolded protein • protein folding
HP subcellular location	• Nucleus Cytoplasm: May translocate to the nucleus after heat shock.
HP tissue specificity	Widely expressed, Tissue enhanced (testis, vagina), eosinophil
References	Mala JG, Takeuchi S. Molecular cloning of OSP94: A significant biomarker protein of hypertensive human heart and a member of HSP110 family. Mol Biotechnol. 2009 Jun;42(2):175-94.
Human Protein (HP)	**60 kDa heat shock protein, mitochondrial (Hsp60)**
Gene and alternative name(s)	*HSPD1*, HSP60, chaperonin 60
UniProt Identifier HP	P10809
HP Epitope	548-**EIPKEE**-553
Viral Protein (VP)	Replicase polyprotein 1ab
UniProt Identifier VP	P0DTD1
Viral Epitope	1205-**EIPKEE**-1210
IEBD	A**EIPKEE**VKPFITESKPSVEQRKQDDKK
HP description	Chaperonin implicated in mitochondrial protein import and macromolecular assembly. Together with Hsp10, facilitates the correct folding of imported proteins. May also prevent misfolding and promote the refolding and proper assembly of unfolded polypeptides generated under stress conditions in the mitochondrial matrix. The functional units of these chaperonins consist of heptameric rings of the large subunit Hsp60, which function as a back-to-back double ring. In a cyclic reaction, Hsp60 ring complexes bind one unfolded substrate protein per ring, followed by the binding of ATP and association with 2 heptameric rings of the co-chaperonin Hsp10. This leads to sequestration of the substrate protein in the inner cavity of Hsp60 where, for a certain period of time, it can fold undisturbed by other cell components. Synchronous hydrolysis of ATP in all Hsp60 subunits results in the dissociation of the chaperonin rings and the release of ADP and the folded substrate protein (Probable) (1).
HP functions	• apolipoprotein binding • ATPase activity, ATP binding • chaperone binding • DNA replication origin binding • double-stranded RNA • enzyme binding • high-density lipoprotein particle binding • insulin binding • isomerase activity • lipopolysaccharide • modification-dependent protein • p53 binding • protease binding • RNA binding • single-stranded DNA binding • ubiquitin protein ligase binding • unfolded protein binding
HP biological processes	• 'de novo' protein folding • activation of cysteine-type endopeptidase activity involved in apoptotic process • apoptotic mitochondrial changes • B cell activation • B cell cytokine production • B cell proliferation • cellular response to heat • cellular response to interleukin-7

	• chaperone-mediated protein complex assembly • interaction with symbiont • isotype switching to IgG isotypes • MyD88-dependent toll-like receptor signaling pathway • negative regulation of apoptotic process • negative regulation of apoptotic process in bone marrow cell • negative regulation of neuron apoptotic • negative regulation of reactive oxygen species biosynthetic process • positive regulation of apoptotic process • positive regulation of inflammatory response • positive regulation of interferon-alpha production • positive regulation of interferon-gamma production • positive regulation of interleukin-10 production • positive regulation of interleukin-12 production • positive regulation of interleukin-6 production • positive regulation of interleukin-6 secretion • positive regulation of macrophage activation • positive regulation of T cell activation • positive regulation of T cell mediated immune response to tumor cell • positive regulation of tumor necrosis factor secretion • protein import into mitochondrial intermembrane space • protein maturation, protein refolding,protein stabilization • regulation of transcription by RNA polymerase II • response to activity • response to ATP • response to cocaine • response to cold • response to estrogen • response to glucocorticoid • response to hydrogen peroxide • response to hypoxia • response to ischemia • response to lipopolysaccharide • response to unfolded protein • T cell activation • viral process
HP intracellular localization	• Mitochondrion matrix • Nucleus • Plasma membrane • Cytoplasm • Secreted
HP tissue specificity	Expressed in all tissues
References	1. Nisemblat S, Yaniv O, Parnas A, Frolow F, Azem A. Crystal structure of the human mitochondrial chaperonin symmetrical football complex. Proc Natl Acad Sci U S A. 2015 May 12;112(19):6044-9.
Human Protein (HP)	**DnaJ homolog subfamily B member 1 (Hsp40)**
Gene and alternative name(s)	*DNAJB1*, DnaJ protein homolog 1, Heat shock 40 kDa protein 1, Human DnaJ protein 1, hDj-1
UniProt Identifier HP	P25685
HP Epitope	42-**EEKFKE**-47
Viral Protein (VP)	Replicase polyprotein 1ab
UniProt Identifier VP	P0DTD1
Viral Epitope	632-**EEKFKE**-637
IEBD	**EEKFKE**GVEF
HP description	Chaperone, stress response

HP functions	Interacts with HSP70 and can stimulate its ATPase activity. Stimulates the association between HSC70 and HIP. Negatively regulates heat shock-induced HSF1 transcriptional activity during the attenuation and recovery phase period of the heat shock response. Stimulates ATP hydrolysis and the folding of unfolded proteins mediated by HSPA1A/B (in vitro) (1,2).
HP biological processes	• chaperone cofactor-dependent protein refolding • negative regulation of inclusion body assembly • negative regulation of transcription from RNA polymerase II promoter in response to stress • positive regulation of ATPase activity • regulation of cellular response to heat response to unfolded protein
HP subcellular location	• Nucleus • Cytoplasm
HP tissue specificity	Widely expressed
References	1. Shi Y, Mosser DD, Morimoto RI. Molecular chaperones as HSF1-specific transcriptional repressors. Genes Dev. 1998 Mar 1;12(5):654-66. 2. Rauch JN, Gestwicki JE. Binding of human nucleotide exchange factors to heat shock protein 70 (Hsp70) generates functionally distinct complexes in vitro. J Biol Chem. 2014 Jan 17;289(3):1402-14
NOTE	The same epitope is present in the homologues: • Q9UDY4_DnaJ homolog subfamily B member 4 (DNAJB4): expressed in the cell membrane; Expressed in heart, pancreas and skeletal muscle, and to a lesser extent in brain, placenta and liver. (Hoe KL, Won M, Chung KS, Jang YJ, Lee SB, Kim DU, Lee JW, Yun JH, Yoo HS. Isolation of a new member of DnaJ-like heat shock protein 40 (Hsp40) from human liver. Biochim Biophys Acta. 1998 Mar 3;1383(1):4-8). • O75953_DnaJ homolog subfamily B member 5 (Hsc40): Widely expressed under normal conditions, its expression can further be increased after various stress treatments.
Human Protein (HP)	**DnaJ homolog subfamily C member 25**
Gene and alternative name(s)	*DNAJC25*
UniProt Identifier HP	Q9H1X3
HP Epitope	22-**LLAPLL**-27
Viral Protein (VP)	Replicase polyprotein 1ab
UniProt Identifier VP	P0DTD1
Viral Epitope	1144-**LLAPLL**-1149
IEBD	HEV**LLAPLL**SAG
HP description	Chaperone
HP functions	protein folding
HP biological processes	protein folding
HP subcellular location	• Membrane • Multi-pass membrane protein
HP tissue specificity	High expressed in liver
References	-
Human Protein (HP)	**DnaJ homolog subfamily B member 2**
UniProt Identifier HP	P25686
HP Epitope	72-**GLTGTG**-77
Viral Protein (VP)	Spike glycoprotein
UniProt Identifier VP	P0DTC2
Viral Epitope	545-**GLTGTG**-550

IEBD	**GLTGTG**VLTESNKKFLPFQQF
HP description	Functions as a co-chaperone, regulating the substrate binding and activating the ATPase activity of chaperones of the HSP70/heat shock protein 70 family. In parallel, also contributes to the ubiquitin-dependent proteasomal degradation of misfolded proteins. Thereby, may regulate the aggregation and promote the functional recovery of misfolded proteins like HTT, MC4R, PRKN, RHO and SOD1 and be crucial for many biological processes. Isoform 1 which is localized to the endoplasmic reticulum membranes may specifically function in ER-associated protein degradation of misfolded proteins (1,2,3).
HP functions	• ATPase activator activity • chaperone binding • Hsp70 protein binding • polyubiquitin modification-dependent protein binding • proteasome binding • ubiquitin binding • ubiquitin-dependent protein binding • ubiquitin protein ligase binding • unfolded protein binding
HP biological processes	• chaperone-mediated protein folding • negative regulation of cell growth • negative regulation of cell population proliferation • negative regulation of inclusion body assembly • negative regulation of protein binding • negative regulation of protein deubiquitination • neuron cellular homeostasis • positive regulation of ATPase activity • positive regulation of proteasomal ubiquitin-dependent protein catabolic process • positive regulation of protein ubiquitination • proteasome-mediated ubiquitin-dependent protein catabolic process • protein refolding • regulation of chaperone-mediated protein folding • regulation of protein localization • regulation of protein ubiquitination • response to unfolded protein • ubiquitin-dependent ERAD pathway S
HP subcellular location	• Nucleus • Cytoplasm • Endoplasmic reticulum • Endoplasmic reticulum membrane-Lipid-anchor-Cytoplasmic side
HP tissue specificity	More abundantly expressed in neocortex, cerebellum, spinal cord and retina where it is expressed by neuronal cells (at protein level). Detected at much lower level in non-neuronal tissues including kidney, lung, heart, skeletal muscle, spleen and testis (at protein level). Isoform 1 is more abundant in neocortex and cerebellum compared to isoform 2 (at protein level).
References	1. Westhoff B, Chapple JP, van der Spuy J, Höhfeld J, Cheetham ME. HSJ1 is a neuronal shuttling factor for the sorting of chaperone clients to the proteasome. Curr Biol. 2005 Jun 7;15(11):1058-64. 2. Rose JM, Novoselov SS, Robinson PA, Cheetham ME. Molecular chaperone-mediated rescue of mitophagy by a Parkin RING1 domain mutant. Hum Mol Genet. 2011 Jan 1;20(1):16-27. 3. Cheetham ME, Brion JP, Anderton BH. Human homologues of the bacterial heat-shock protein DnaJ are preferentially expressed in neurons. Biochem J. 1992 Jun 1;284 (Pt 2)(Pt 2):469-76
Human Protein (HP)	**DnaJ homolog subfamily C member 9 (HDJC9)**

Gene and alternative name(s)	*DNAJC9,* DnaJ protein SB73, HDJC91
UniProt Identifier HP	Q8WXX5
HP Epitope	68-**VLSDRE**-73
Viral Protein (VP)	Replicase polyprotein 1ab
UniProt Identifier VP	P0DTD1
Viral Epitope	5481-**VLSDRE**-5486
IEBD	VRE**VLSDRE**LHLSWE
HP description	Chaperone
HP functions	May play a role as co-chaperone of the Hsp70 family proteins HSPA1A, HSPA1B and HSPA8 (1).
HP biological processes	• heat shock protein binding • positive regulation of ATPase activity
HP subcellular location	Predominantly nuclear. Translocates to the cytoplasm and membrane after heat shock
HP tissue specificity	Expressed in heart, placenta, liver, skeletal muscle, kidney, pancreas, thymus, ovary, colon and peripheral blood.
References	1. Han C, Chen T, Li N, Yang M, Wan T, Cao X. HDJC9, a novel human type C DnaJ/HSP40 member interacts with and cochaperones HSP70 through the J domain. Biochem Biophys Res Commun. 2007 Feb 9;353(2):280-5.
Human Protein (HP)	**DnaJ homolog subfamily C member 14**
Gene and alternative name(s)	*DNAJC14*, DnaJ protein homolog 3, Dopamine receptor-interacting protein of 78 kDa, DRIP78, Human DnaJ protein 3, hDj-3
UniProt Identifier HP	Q6Y2X3
HP Epitope	182-**DFSRVS**-187
Viral Protein (VP)	Replicase polyprotein 1ab
UniProt Identifier VP	P0DTD1
Viral Epitope	6057-**DFSRVS**-6062
IEBD	PNNT**DFSRVS**AKPPP
HP description	Chaperone, regulates the export of target proteins, such as DRD1, from the endoplasmic reticulum to the cell surface (1)
HP functions	Protein transport
HP biological processes	Protein transport
HP subcellular location	• Endoplasmic reticulum membrane • Multi-pass membrane protein
HP tissue specificity	Highly expressed in pancreas and selectively expressed in brain, lung, liver, skeletal muscle and kidney
References	1. Chen J, Huang Y, Wu H, Ni X, Cheng H, Fan J, Gu S, Gu X, Cao G, Ying K, Mao Y, Lu Y, Xie Y. Molecular cloning and characterization of a novel human J-domain protein gene (HDJ3) from the fetal brain. J Hum Genet. 2003;48(5):217-221
Human Protein (HP)	**Alpha-crystallin A chain**
Gene and alternative name(s)	*CRYAA,* Heat shock protein beta-4, HspB4
UniProt Identifier HP	P02489
HP Epitope	91-**DDFVEI**-96
Viral Protein (VP)	Replicase polyprotein 1ab
IEBD	SKCVCSVIDLLL**DDFVEI**l CSVIDLLL**DDFVEI**l
UniProt Identifier VP	P0DTD1
Viral Epitope	6752-**DDFVEI**-6757
HP description	Chaperone
HP functions	Contributes to the transparency and refractive index of the lens. In its oxidized form (absence of intramolecular disulfide bond), acts as a chaperone, preventing aggregation of various proteins under a wide range

	of stress conditions. Required for the correct formation of lens intermediate filaments as part of a complex composed of BFSP1, BFSP2 and CRYAA (1,2,3).
HP biological processes	• heat shock protein binding • positive regulation of ATPase activity
HP subcellular location	• Plasma membrane • Nucleus • Cytoplasm
HP tissue specificity	Expressed in heart, placenta, liver, skeletal muscle, kidney, pancreas, thymus, ovary, colon and peripheral blood
References	1. Nagaraj RH, Nahomi RB, Shanthakumar S, Linetsky M, Padmanabha S, Pasupuleti N, Wang B, Santhoshkumar P, Panda AK, Biswas A. Acetylation of αA-crystallin in the human lens: effects on structure and chaperone function. Biochim Biophys Acta. 2012 Feb;1822(2):120-9. 2. Han C, Chen T, Li N, Yang M, Wan T, Cao X. HDJC9, a novel human type C DnaJ/HSP40 member interacts with and cochaperones HSP70 through the J domain. Biochem Biophys Res Commun. 2007 Feb 9;353(2):280-5 3. Chaves JM, Gupta R, Srivastava K, Srivastava O. Human alpha A-crystallin missing N-terminal domain poorly complexes with filensin and phakinin. Biochem Biophys Res Commun. 2017 Dec 9;494(1-2):402-408.
Human Protein (HP)	**Heat shock protein HSP 90-beta**
Gene and alternative name(s**)**	*HSP90AB1*, Heat shock protein HSP 90-beta, HSP90, HSP84
UniProt Identifier HP	P08238
HP Epitope	263-**KDKKKK**-268
Viral Protein (VP)	Nucleoprotein
UniProt Identifier VP	P0DTC9
Viral Epitope	370-**KDKKKK**-375
IEBD	KTFPPTEPK**KDKKKK**ADETQALPQRQKKQQ
HP description	Molecular chaperone that promotes the maturation, structural maintenance and proper regulation of specific target proteins involved for instance in cell cycle control and signal transduction. Undergoes a functional cycle that is linked to its ATPase activity. This cycle probably induces conformational changes in the client proteins, thereby causing their activation. Interacts dynamically with various co-chaperones that modulate its substrate recognition, ATPase cycle and chaperone function. Engages with a range of client protein classes via its interaction with various co-chaperone proteins or complexes, that act as adapters, simultaneously able to interact with the specific client and the central chaperone itself. Recruitment of ATP and co-chaperone followed by client protein forms a functional chaperone. After the completion of the chaperoning process, properly folded client protein and co-chaperone leave HSP90 in an ADP-bound partially open conformation and finally, ADP is released from HSP90 which acquires an open conformation for the next cycle. Apart from its chaperone activity, it also plays a role in the regulation of the transcription machinery. HSP90 and its co-chaperones modulate transcription at least at three different levels. In the first place, they alter the steady-state levels of certain transcription factors in response to various physiological cues. Second, they modulate the activity of certain epigenetic modifiers, such as histone deacetylases or DNA methyl transferases, and thereby respond to the change in the environment. Third, they participate in the eviction of histones from the promoter region of certain genes and thereby turn on gene expression. Antagonizes STUB1-mediated inhibition of TGF-beta signaling via inhibition of STUB1-mediated SMAD3 ubiquitination and degradation. Promotes cell differentiation by chaperoning BIRC2 and thereby protecting from auto-ubiquitination and degradation by the proteasomal machinery. Main chaperone that is involved in the phosphorylation/activation of the

	STAT1 by chaperoning both JAK2 and PRKCE under heat shock and in turn, activates its own transcription (1,2,3,4). In the resting state, through the dimerization of its C-terminal domain, HSP90 forms a homodimer which is defined as the open conformation. Upon ATP-binding, the N-terminal domain undergoes significant conformational changes and comes in contact to form an active closed conformation. After HSP90 finishes its chaperoning tasks of assisting the proper folding, stabilization and activation of client proteins under the active state, ATP molecule is hydrolyzed to ADP which then dissociates from HSP90 and directs the protein back to the resting state (5).
HP functions	• ATPase activity, ATP binding, ATP-dependent protein binding • cadherin binding • CTP binding • dATP binding • disordered domain specific • DNA polymerase binding • double-stranded RNA • GTP binding • heat shock protein binding • histone deacetylase • histone methyltransferase • identical protein • ion channel • kinase • MHC class II protein complex • nitric-oxide synthase regulator activity • peptide binding • protein dimerization • protein folding chaperone • protein homodimerization activity • protein kinase binding • protein kinase regulator activity • RNA binding • sulfonylurea receptor binding • tau protein binding • TPR domain • ubiquitin protein ligase • unfolded protein • UTP binding
HP biological processes	• axon extension • cellular response to drug • cellular response to heat • cellular response to interleukin-4 • cellular response to organic cyclic compound • central nervous system neuron axonogenesis • chaperone-mediated protein complex assembly • establishment of cell polarity • Fc-gamma receptor signaling pathway involved in phagocytosis • negative regulation of cell cycle arrest • negative regulation of complement-dependent cytotoxicity • negative regulation of neuron apoptotic process • negative regulation of proteasomal protein catabolic process • negative regulation of proteasomal ubiquitin-dependent protein catabolic process • negative regulation of protein metabolic process • negative regulation of transforming growth factor beta activation • neutrophil degranulation

	• placenta development • positive regulation of cell differentiation • positive regulation of cell size • positive regulation of cyclin-dependent protein kinase activity • positive regulation of nitric oxide biosynthetic process • positive regulation of peptidyl-serine phosphorylation • positive regulation of phosphoprotein phosphatase activity • positive regulation of protein binding • positive regulation of protein import into nucleus • positive regulation of protein kinase B signaling Source: ARUK-UCL • positive regulation of protein localization to cell surface • positive regulation of protein serine/threonine kinase activity • positive regulation of tau-protein kinase activity Source: ARUK-UCL • positive regulation of telomerase activity • positive regulation of transforming growth factor beta receptor signaling pathway • protein folding • protein stabilization • regulation of cellular protein localization • regulation of cellular response to heat • regulation of interferon-gamma-mediated signaling pathway • regulation of protein ubiquitination • regulation of type I interferon-mediated signaling pathway • response to cocaine • response to salt stress • response to unfolded protein • supramolecular fiber organization • telomerase holoenzyme complex assembly • telomere maintenance via telomerase • virion attachment to host cell • xenobiotic metabolic process
HP subcellular location	• Plasma membrane • Cell membrane • Extracellular region or secreted • Nucleus • Cytoplasm • Melanosome
HP tissue specificity	Widely expressed
References	1. Verma S, Goyal S, Jamal S, Singh A, Grover A. Hsp90: Friends, clients and natural foes. Biochimie. 2016 Aug;127:227-40 2. Didelot C, Lanneau D, Brunet M, Bouchot A, Cartier J, Jacquel A, Ducoroy P, Cathelin S, Decologne N, Chiosis G, Dubrez-Daloz L, Solary E, Garrido C. Interaction of heat-shock protein 90 beta isoform (HSP90 beta) with cellular inhibitor of apoptosis 1 (c-IAP1) is required for cell differentiation. Cell Death Differ. 2008 May;15(5):859-66. 3. Retzlaff M, Stahl M, Eberl HC, Lagleder S, Beck J, Kessler H, Buchner J. Hsp90 is regulated by a switch point in the C-terminal domain. EMBO Rep. 2009 Oct;10(10):1147-53. 4. Cheng MB, Zhang Y, Zhong X, Sutter B, Cao CY, Chen XS, Cheng XK, Zhang Y, Xiao L, Shen YF. Stat1 mediates an auto-regulation of hsp90beta gene in heat shock response. Cell Signal. 2010 Aug;22(8):1206-13 5. Richter K, Soroka J, Skalniak L, Leskovar A, Hessling M, Reinstein J, Buchner J. Conserved conformational changes in the ATPase cycle of human Hsp90. J Biol Chem. 2008 Jun 27;283(26):17757-65
NOTE	The same epitope is present in the putative heat shock protein HSP 90-beta 2. (HSP90Bb, Uniprot ID Q58FF8). This chaperone is

	expressed in the cytoplasm.
Human Protein (HP)	**Sacsin**
Gene and alternative name(s)	SACS, Sacsin, DnaJ homolog subfamily C member 29, DNAJC29
UniProt Identifier HP	Q9NZJ4
HP Epitope	2546-**LKELLQN**-2552
Viral Protein (VP)	Replicase polyprotein 1ab
UniProt Identifier VP	P0DTD1
Viral Epitope	3531-**LKELLQN**-3537
HP description	Co-chaperone which acts as a regulator of the Hsp70 chaperone machinery and may be involved in the processing of other ataxia-linked proteins (1,2,3)
IEDB	AVLDMCAS**LKELLQN**
HP functions	• chaperone binding • Hsp70 protein binding • proteasome binding
HP biological processes	• negative regulation of inclusion body assembly • protein folding
HP subcellular location	• Mitochondrion • Nucleus • axon • cell body fiber • cytoplasm • dendrite
HP tissue specificity	Highly expressed in the central nervous system. Also found in skeletal muscle and at low levels in pancreas.
References	1. Anderson JF, Siller E, Barral JM. The sacsin repeating region (SRR): a novel Hsp90-related supra-domain associated with neurodegeneration. J Mol Biol. 2010;400(4):665-674. 2. Hein MY, Hubner NC, Poser I, et al. A human interactome in three quantitative dimensions organized by stoichiometries and abundances. Cell. 2015;163(3):712-723. 3. Parfitt DA, Michael GJ, Vermeulen EG, et al. The ataxia protein sacsin is a functional co-chaperone that protects against polyglutamine-expanded ataxin-1. Hum Mol Genet. 2009;18(9):1556-1565.
Human Protein (HP)	**FK506-binding protein-like**
Gene and alternative name(s)	*FKBPL,* WAF-1/CIP1 stabilizing protein 39, WISp39
UniProt Identifier HP	Q9UIM3
HP Epitope	69-**LVAELEG**-75
Viral Protein (VP)	Replicase polyprotein 1ab
UniProt Identifier VP	P0DTD1
Viral Epitope	88-**LVAELEG**-94
IEBD	MVE**LVAELEG**IQY
HP description	Regulates p21 protein stability by binding to Hsp90 and p21 (CDKN1A/p21 and HSP90AB1/Hsp90) (1,2)
HP functions	• protein stabilization • regulation of blood vessel branching • regulation of angiogenesis • response to radiation
HP biological processes	-
HP subcellular location	• Cytosol • Extracellular region or secreted
HP tissue specificity	Ubiquitously expressed
References	1. Jascur T, Brickner H, Salles-Passador I, Barbier V, El Khissiin A, Smith B, Fotedar R, Fotedar A. Regulation of p21(WAF1/CIP1) stability by WISp39, a Hsp90 binding TPR protein. Mol Cell. 2005

	Jan 21;17(2):237-49. 2. Yakkundi A, Bennett R, Hernández-Negrete I, Delalande JM, Hanna M, Lyubomska O, Arthur K, Short A, McKeen H, Nelson L, McCrudden CM, McNally R, McClements L, McCarthy HO, Burns AJ, Bicknell R, Kissenpfennig A, Robson T. FKBPL is a critical antiangiogenic regulator of developmental and pathological angiogenesis. Arterioscler Thromb Vasc Biol. 2015 Apr;35(4):845-54.
Human Protein (HP)	**Stress-responsive DNAJB4 (Hsp40)-interacting membrane protein 1**
Gene and alternative name(s)	*SDIM1*
UniProt Identifier HP	Q6ZPB5
HP Epitope	37-**LGSPLSL**-43
Viral Protein (VP)	ORF9b
UniProt Identifier VP	P0DTD2
Viral Epitope	48-**LGSPLSL**-54
IEBD	PIILR**LGSPLSL**NMA
HP description	Promotes neuronal cells survival to stress conditions (1)
HP functions	• protein homodimerization activity
HP biological processes	• cellular response to hypoxia • negative regulation of cell death • neuron apoptotic process
HP subcellular location	• Membrane • Multi-pass membrane protein
HP tissue specificity	• Expressed in brain with higher detection in neurons than astrocytes. Decreased expression in Alzheimer brains. Detected at protein level in brain and cervix • Down-regulated in NT2 neurons (neuro-progenitor cells) subjected to stress conditions which triggers neuronal apoptosis such as oxygen and glucose deprivation, followed by up-regulation in surviving cells.
References	1. Lei JX, Cassone CG, Luebbert C, Liu QY. A novel neuron-enriched protein SDIM1is down regulated in Alzheimer's brains and attenuates cell death induced by DNAJB4 over-expression in neuro-progenitor cells. Mol Neurodegener. 2011 Jan 21;6(1):9.