

Table S2 Phosphoserine clusters entirely conforming to the consensus sequences of CK2 and/or Fam20C.

GROUP 1		Motif: (pS)_n-E-E-x x≠[E,D,pS] n≥3
ID	Description	Peptide
B3KS81	SRRM5_HUMAN Serine/arginine repetitive matrix protein 5 GN=SRRM5	RERRQSRs s s s <u>EEER</u> DHsRSRS
P05814	CASB_HUMAN Beta-casein GN=CSN2	REtIEsLs s s s <u>EES</u> ITEYKQK
P18583	SON_HUMAN Protein SON GN=SON	MPERAsEs s s s <u>EEK</u> DdYEIFV
P30414	NKTR_HUMAN NK-tumor recognition protein GN=NKTR	KKRRKEAs s s s <u>EE</u> PRNKHAMN
P47710	CASA1_HUMAN Alpha-S1-casein GN=CSN1S1	KMEs s I s s s s <u>EE</u> MSLSKCAE
P67870	CSK2B_HUMAN Casein kinase II subunit beta GN=CSNK2B	-----Ms s s s <u>EE</u> VsWISWFC
Q6ZNB6	NFXL1_HUMAN NF-X1-type zinc finger protein NFXL1 GN=NFXL1	LVEEQFs s s s s <u>EE</u> GDEDFEGK
Q9Y6X4	F169A_HUMAN Soluble lamin-associated protein of 75 kDa GN=FAM169A	SAEKAVDs s s s <u>EE</u> IEVEVPVV

GROUP 2		Motif (pS)_n-E/D-E/D-E/D n≥3
P18887	XRCC1_HUMAN DNA repair protein XRCC1 GN=XRCC1	YLMAGPGs s s s <u>EE</u> DEAsHsGG
P28715	ERCC5_HUMAN DNA repair protein complementing XP-G cells GN=ERCC5	MQAALLGs s s s <u>EEEE</u> LEsENRR
P50402	EMD_HUMAN Emerin GN=EMD	VHDDDLs s s s <u>EEEE</u> CKDRERP
Q01831	XPC_HUMAN DNA repair protein complementing XP-C cells GN=XPC	RKKRSKPs s s s <u>EE</u> DEGPGDKQ
Q14978	NOLC1_HUMAN Nucleolar and coiled-body phosphoprotein 1 GN=NOLC1	DSSDESs s s s <u>EEEE</u> KKPPTKA
Q5SYE7	NHSL1_HUMAN NHS-like protein 1 GN=NHSL1	TDQKCsLs s s s <u>EE</u> ERFI sIRR
Q5T1M5	FKB15_HUMAN FK506-binding protein 15 GN=FKBP15	QEQEKEEs s s s <u>EEEE</u> EKAER
Q76FK4	NOL8_HUMAN Nucleolar protein 8 GN=NOL8	EDPRLQDs s s s <u>EE</u> EDVTEETD
Q7Z6E9	RBBP6_HUMAN E3 ubiquitin-protein ligase RBBP6 GN=RBBP6	FLPEEPs s s s s <u>EE</u> DDPIPEL
Q8N3X1	FNBP4_HUMAN Formin-binding protein 4 GN=FNBP4	LDEEDNs s s s s <u>EE</u> DRESTAQK
Q8N5B7	CERS5_HUMAN Ceramide synthase 5 GN=CERS5	DDRsDVEs s s s <u>EE</u> EDVTTCTK
Q9BRX2	PELO_HUMAN Protein pelota homolog GN=PELO	LsDQEGDs s s s <u>EE</u> D-----
Q9BXY0	MAK16_HUMAN Protein MAK16 homolog GN=MAK16	DEDQDGKs s s s <u>EEEE</u> EKALSA

Q9H019	MFR1L_HUMAN Mitochondrial fission regulator 1-like GN=MFR1L	PEHKAACsssEEDDCVSLsK
Q9HCM1	K1551_HUMAN Uncharacterized protein KIAA1551 GN=KIAA1551	QCNSIKNsssEEEKQKEQCs
P35659	DEK_HUMAN Protein DEK GN=DEK	PEILsDEsssDEDEKKNKEE
P45973	CBX5_HUMAN Chromobox protein homolog 5 GN=CBX5	TKRtADsssEDEEEyVVEK
Q02952	AKA12_HUMAN A-kinase anchor protein 12 GN=AKAP12	KKRARRGsssDEEGGPKAMG
Q13216	ERCC8_HUMAN DNA excision repair protein ERCC-8 GN=ERCC8	PAFEDAWsssDEEG-----
Q13371	PHLP_HUMAN Phosducin-like protein GN=PDCL	EKLQYyysEDEDsDHEDK
Q13415	ORC1_HUMAN Origin recognition complex subunit 1 GN=ORC1	PAAEIsDsssDEEEASTPPL
Q14839	CHD4_HUMAN Chromodomain-helicase-DNA-binding protein 4 GN=CHD4	FGsKRKRsssEDDDLdVesD
Q14978	NOLC1_HUMAN Nucleolar and coiled-body phosphoprotein 1 GN=NOLC1	KsssEDsssDEEEEQKKPM
Q15047	SETB1_HUMAN Histone-lysine N-methyltransferase SETDB1 GN=SETDB1	LGLQYRDsssEDESsrPTEI
Q56P03	EAPP_HUMAN E2F-associated phosphoprotein GN=EAPP	sDEEPALsssEDEVdVLLHG
Q56P03	EAPP_HUMAN E2F-associated phosphoprotein GN=EAPP	CLtGEsEsssEDEFEKEMEA
Q5H9R7	PP6R3_HUMAN Serine/threonine-protein phosphatase 6 regulatory subunit 3 GN=PPP6R3	VTTCHIHsssDDEIDFKETG
Q5JSH3	WDR44_HUMAN WD repeat-containing protein 44 GN=WDR44	HTDQDDPsssDDEGMPytRP
Q5T5U3	RHG21_HUMAN Rho GTPase-activating protein 21 GN=ARHGAP21	PKEKAQPsssEDELdNVFFK
Q6ZMG9	CERS6_HUMAN Ceramide synthase 6 GN=CERS6	DDRSdIEsssDEEDSEPPGK
Q6ZRS2	SRCAP_HUMAN Helicase SRCAP GN=SRCAP	GQGEsEGsssDEDGSRPLTR
Q8N9N8	EIF1A_HUMAN Probable RNA-binding protein EIF1AD GN=EIF1AD	PQLsGEEsssEDDSDLFVNT
Q8WWQ0	PHIP_HUMAN PH-interacting protein GN=PHIP	NKTKKAEsssDEEEESEKQK
Q96AQ6	PBIP1_HUMAN Pre-B-cell leukemia transcription factor-interacting protein 1 GN=PBXIP1	IREEGRCSsssDDDtDvdMEG
Q96JM2	ZN462_HUMAN Zinc finger protein 462 GN=ZNF462	MKEKMEsssDDEdKKEEMN
Q9P0J7	KCMF1_HUMAN E3 ubiquitin-protein ligase KCMF1 GN=KCMF1	TLVREEsssDEDdRGEMAD
Q9UPN7	PP6R1_HUMAN Serine/threonine-protein phosphatase 6 regulatory subunit 1 GN=PPP6R1	VNtHHLHsssDDEdDRLKEF
O75925	PIAS1_HUMAN E3 SUMO-protein ligase PIAS1 GN=PIAS1	VIDLtIDsssDEEEEEPsAK
O75928	PIAS2_HUMAN E3 SUMO-protein ligase PIAS2 GN=PIAS2	VIDLTIEsssDEEEDPPAKR

P08240	SRPR_HUMAN Signal recognition particle receptor subunit alpha GN=SRPR	QLQDLDCsssDDEGAAQNST
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GROUP 3A		Motif (pS)_n-E/D-E/D-pS n≥3
O43164	PJA2_HUMAN E3 ubiquitin-protein ligase Praja-2 GN=PJA2	SGTEKDQsssDEsWEtLPGK
P29590-2	PML_HUMAN Isoform PML-5 of Protein PML GN=PML	EERVVVIssssEDsDAENSVS
P29590	PML_HUMAN Protein PML GN=PML	EERVVVIssssEDsDAENSSS
Q13428	TCOF_HUMAN Treacle protein GN=TCOF1	KREEDsQsssEEsDsEEEAP
Q13428	TCOF_HUMAN Treacle protein GN=TCOF1	KQEEDsRsssEEsDsDREAL
Q13428	TCOF_HUMAN Treacle protein GN=TCOF1	GKQDDsGsssEEsDSDGEAP
Q14978 *	NOLC1_HUMAN Nucleolar and coiled-body phosphoprotein 1 GN=NOLC1	ssssssSSSSDDsEEEKAAA
Q2WVGJ9	FR1L6_HUMAN Fer-1-like protein 6 GN=FER1L6	IYKSPQDsssEDsGQLRIQQ
Q6IE81	JADE1_HUMAN Protein Jade-1 GN=JADE1	MKRGRLPsssEDsDDNGsLs
Q6PD62	CTR9_HUMAN RNA polymerase-associated protein CTR9 homolog GN=CTR9	IKSKAIIsssDDsDEDKLLK
Q9UHB7	AFF4_HUMAN AF4/FMR2 family member 4 GN=AFF4	LKDDLKLsssEDsDGEQDCD

* in the case of the Q14978 cluster the assumption has been made that the three terminal serines conforming to the group 3A motif (SSSDDs) do undergo phosphorylation under certain circumstances.

GROUP 3B		Motif (pS)_nE/D-pS-E/D n≥3
P28715	ERCC5_HUMAN DNA repair protein complementing XP-G cells GN=ERCC5	NGGATtSsssDsDDDGGKEK
P54198	HIRA_HUMAN Protein HIRA GN=HIRA	RPRDLLEsssDsDEKVPLAK
P56181-2	NDUV3_HUMAN Isoform 2 of NADH dehydrogenase [ubiquinone] flavoprotein 3, mitochondrial GN=NDUFV3	PsSsssssssssDsEsDDEADV
Q13427	PPIG_HUMAN Peptidyl-prolyl cis-trans isomerase G GN=PPIG	sSsssssssssssDsDsssDSQs
Q13428	TCOF_HUMAN Treacle protein GN=TCOF1	SESTARssssEsEDEDEVIPA
Q14978	NOLC1_HUMAN Nucleolar and coiled-body phosphoprotein 1 GN=NOLC1	KKAKKKAsssDsEDsEEEE
Q6AI08	HEAT6_HUMAN HEAT repeat-containing protein 6 GN=HEATR6	SSSWKRVsssEsDFsDAEGG
Q7Z4V5	HDGR2_HUMAN Hepatoma-derived growth factor-related protein 2 GN=HDGFRP2	GRGRGPPsssDsEPEAELEK
Q8N9T8	KRII_HUMAN Protein KRII homolog GN=KRII	TFYNRtAsssDsEEDPEALE
Q96T23	RSF1_HUMAN Remodeling and spacing factor 1 GN=RSF1	RVHKRRLsssEsEEsyLSKN
Q9NZW4	DSPP_HUMAN Dentin sialophosphoprotein GN=DSPP	SDSSDSNssssDsDSSDsDSS

GROUP 3C		Motif (pS)_n-E/D-pS-pS n≥3
Q15059	BRD3_HUMAN Bromodomain-containing protein 3 GN=BRD3	GsSSSSsGssss <u>Dss</u> DsE----
Q8WUF8	F172A_HUMAN Protein FAM172A GN=FAM172A	KPKIHVQsss <u>Dss</u> DEPAEKR
Q9UQ35	SRRM2_HUMAN Serine/arginine repetitive matrix protein 2 GN=SRRM2	PEKLPQsssss <u>Ess</u> PPsPQPt

GROUP 4		Motif (pS)_n-E/D-x-E/D/pS x≠[D, E,pS] n≥3
O95873	CF047_HUMAN Uncharacterized protein C6orf47 GN=C6orf47	PEPRRVDsss <u>ENs</u> GsDWDSA
P07332	FES_HUMAN Tyrosine-protein kinase Fes/Fps GN=FES	QDDRHstsss <u>EQE</u> REGGRtP
P23497	SP100_HUMAN Nuclear autoantigen Sp-100 GN=SP100	PsRKRRFsss <u>DFs</u> DLsNGEE
P46100	ATRX_HUMAN Transcriptional regulator ATRX GN=ATRX	NsKEEGtsss <u>EKs</u> KSsGSSR
P48634-2	PRC2A_HUMAN Isoform 2 of Protein PRRC2A GN=PRRC2A	WRQRRKQsss <u>EIs</u> LAVRAR
Q14511	CASL_HUMAN Enhancer of filamentation 1 GN=NEDD9	KEQAPDCsss <u>DGs</u> ERSWMDD
Q14978	NOLC1_HUMAN Nucleolar and coiled-body phosphoprotein 1 GN=NOLC1	PAKKAAssss <u>DSs</u> DSDsSED
Q5BKY9	F133B_HUMAN Protein FAM133B GN=FAM133B	sssDsSsssss <u>DSE</u> DEDKKQG
Q86UV5	UBP48_HUMAN Ubiquitin carboxyl-terminal hydrolase 48 GN=USP48	SAPELNVsss <u>E</u> TEEDKKEAK
Q86YS7	C2CD5_HUMAN C2 domain-containing protein 5 GN=C2CD5	KsYsRQsssss <u>DTD</u> LSLtPKt
Q8N806	UBR7_HUMAN Putative E3 ubiquitin-protein ligase UBR7 GN=UBR7	NsEPCAGsss <u>ESD</u> LQTVFKN
Q8NI08	NCOA7_HUMAN Nuclear receptor coactivator 7 GN=NCOA7	PGATVsPsss <u>DAE</u> yDKLPDA
Q92614	MY18A_HUMAN Unconventional myosin-XVIIIa GN=MYO18A	AssRRVsssss <u>ELD</u> LpSGDHC
Q96HA7	TONSL_HUMAN Tonsoku-like protein GN=TONSL	HGPAssssss <u>EGE</u> DSAGPAR
Q96JM2	ZN462_HUMAN Zinc finger protein 462 GN=ZNF462	PIQQLNRsss <u>ERD</u> GPPVENE
Q96JM3	CHAP1_HUMAN Chromosome alignment-maintaining phosphoprotein 1 GN=CHAMP1	MDIKGQEssss <u>DQE</u> QVDVESI
Q96SD1	DCR1C_HUMAN Protein artemis GN=DCLRE1C	STNADsQsss <u>DFE</u> VpStPEA
Q9BUL5	PHF23_HUMAN PHD finger protein 23 GN=PHF23	TSQDGDAssss <u>EGE</u> MRVMDDED
Q9NQB0	TF7L2_HUMAN Transcription factor 7-like 2 GN=TCF7L2	ESETNQNssss <u>DSE</u> AERRPPP

Q9UQ35	SRRM2_HUMAN Serine/arginine repetitive matrix protein 2 GN=SRRM2	STRsSGHs <u>ss</u> ELsPDAVEKA
Q9Y2W1	TR150_HUMAN Thyroid hormone receptor-associated protein 3 GN=THRAP3	HsRNSDKs <u>ss</u> DRsRRSSSSR
Q9Y520	PRC2C_HUMAN Protein PRRC2C GN=PRRC2C	GKAAGsPs <u>ss</u> DQDEKLPQD
Q9Y5B0	CTDP1_HUMAN RNA polymerase II subunit A C-terminal domain phosphatase GN=CTDP1	ssNEDEGs <u>ss</u> EADEMAKALE