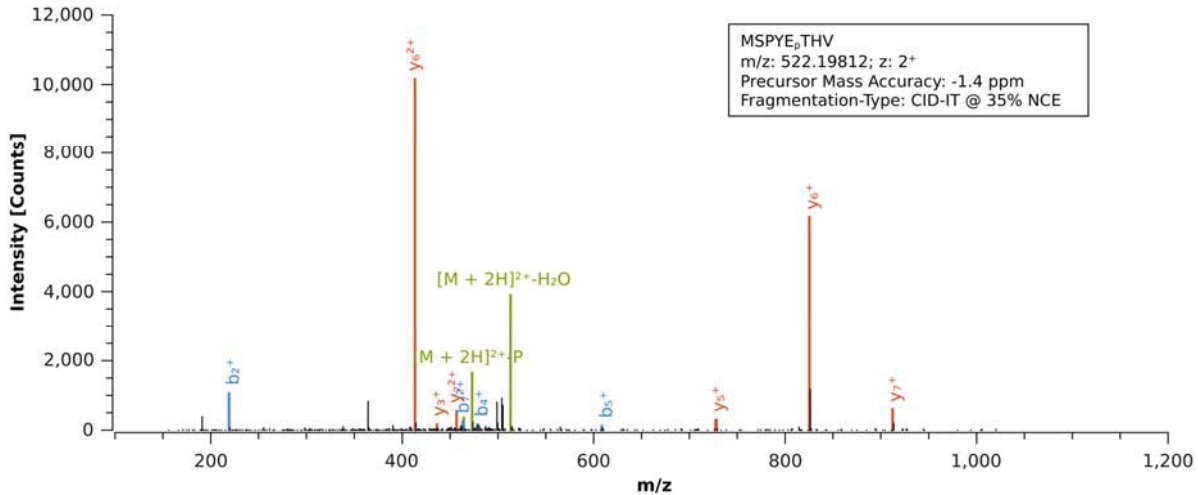
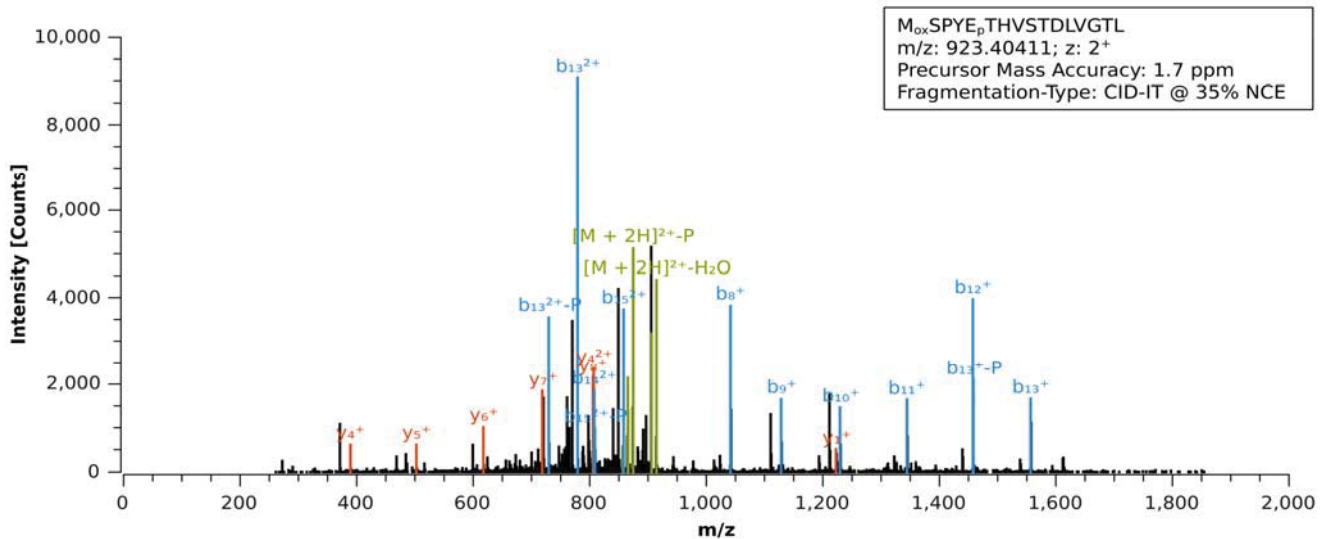


Supplemental Figure S1A, B

A



B



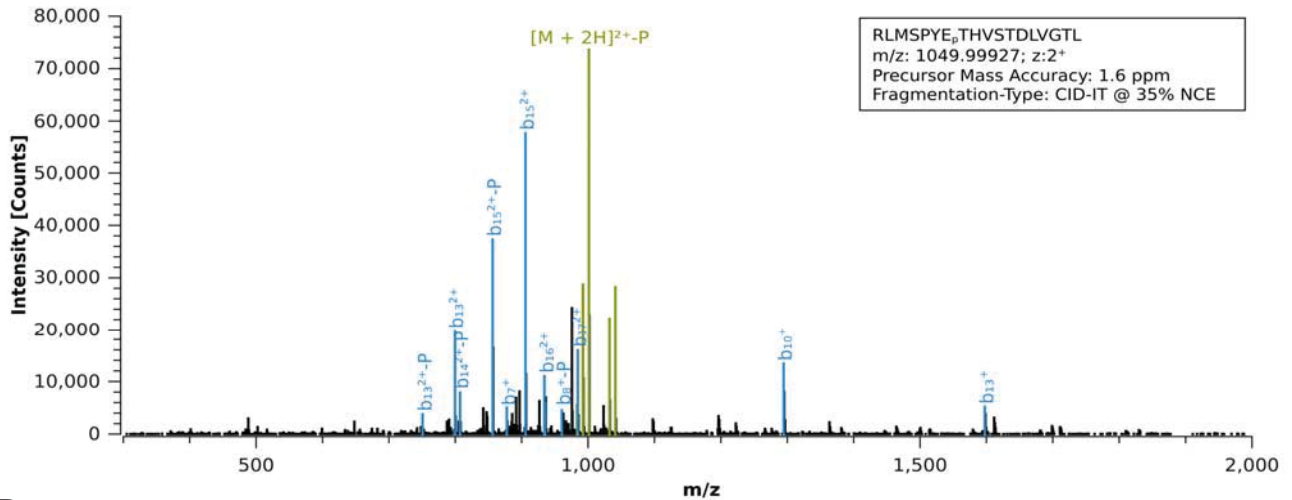
Supplemental Figure S1. LC-ESI MS/MS spectra identifying PSKR1 *in vitro* phosphorylation sites.

(A) LC-ESI MS/MS of the phosphopeptide MSPYEpTHV with a measured m/z value of 522.20; a precursor charge state of 2+. Calculated mass deviation was -1.4 ppm. The precursor ion was fragmented by Collision Induced Dissociation (CID) and analysed in the ion trap mass analyser (IT). The normalized collision energy was set to 35%. Peptide ions, which were passing the filter settings were annotated in red (y-ions) and blue (b-ions). Precursor related ions were labeled in green.

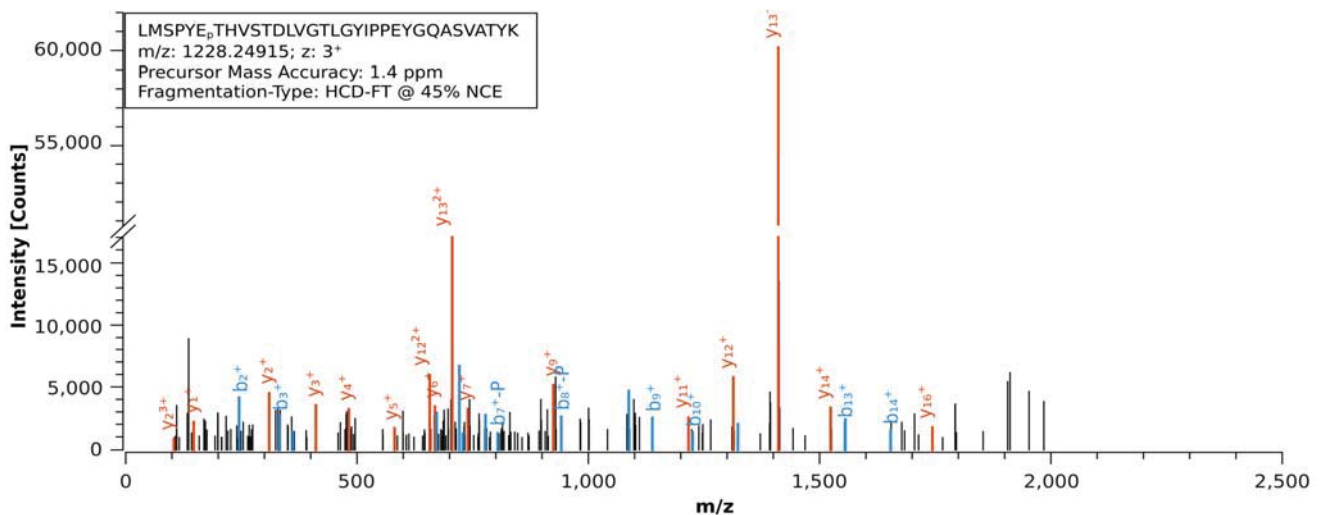
(B) LC-ESI MS/MS of the phosphopeptide MoxSPYEpTHVSTDVLVGT with a measured m/z value of 923.40; a precursor charge state of 2+. The mass deviation was calculated to be 1.7 ppm. Precursor ion fragmentation and analysis were carried out as described for (A).

Supplemental Figure S1C, D

C



D



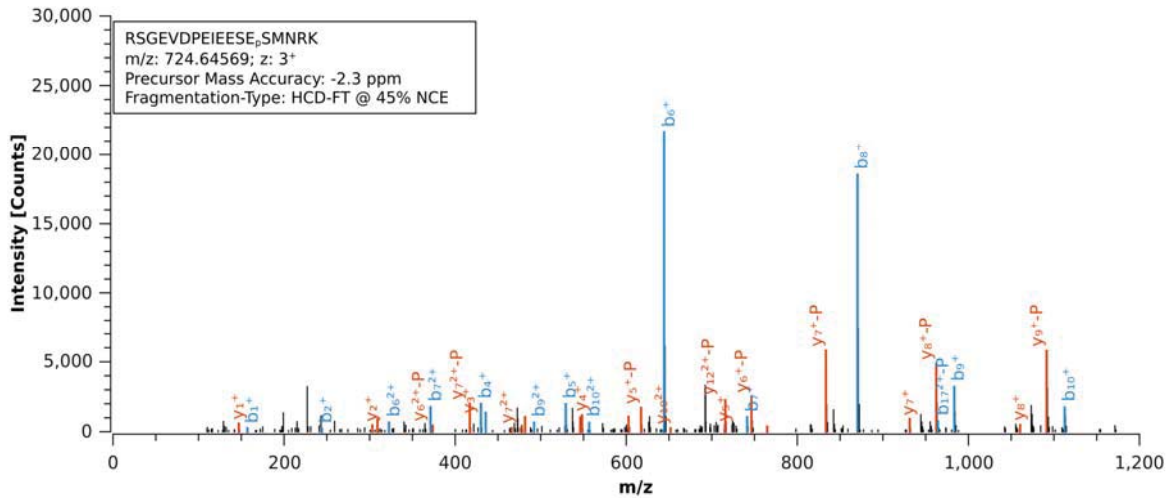
Supplemental Figure S1. LC-ESI MS/MS spectra identifying PSKR1 *in vitro* phosphorylation sites.

(C) LC-ESI MS/MS of the phosphopeptide RLMSPYE_pTHVSTDLVGTL with a measured m/z value of 1050.00; a precursor charge state of 2+. The mass deviation was calculated to be 1.6 ppm. Precursor ion fragmentation and analysis were carried out as described for (A).

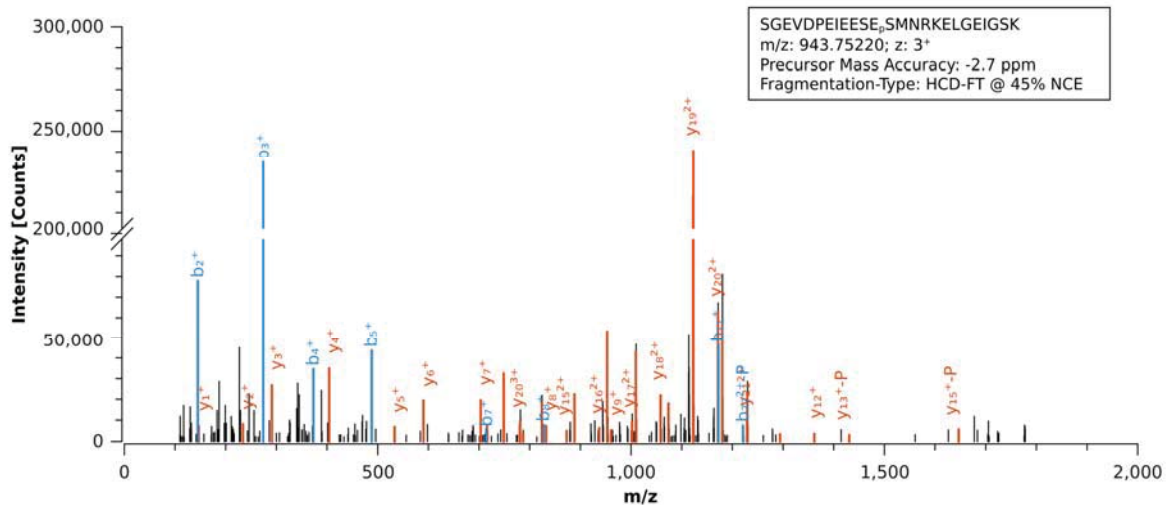
(D) LC-ESI MS/MS of the phosphopeptide LMSPYE_pTHVSTDLVGLGYPPEY_GQASVATYK with a measured m/z value of 1228.24; a precursor charge state of 3+. The mass deviation was calculated to be 1.4 ppm. The precursor ion was fragmented by Higher Energy Collision Dissociation (HCD) and analysed in the Orbitrap mass analyser (FT). The normalized collision energy was set to 45%.

Supplemental Figure S2A, B

A



B



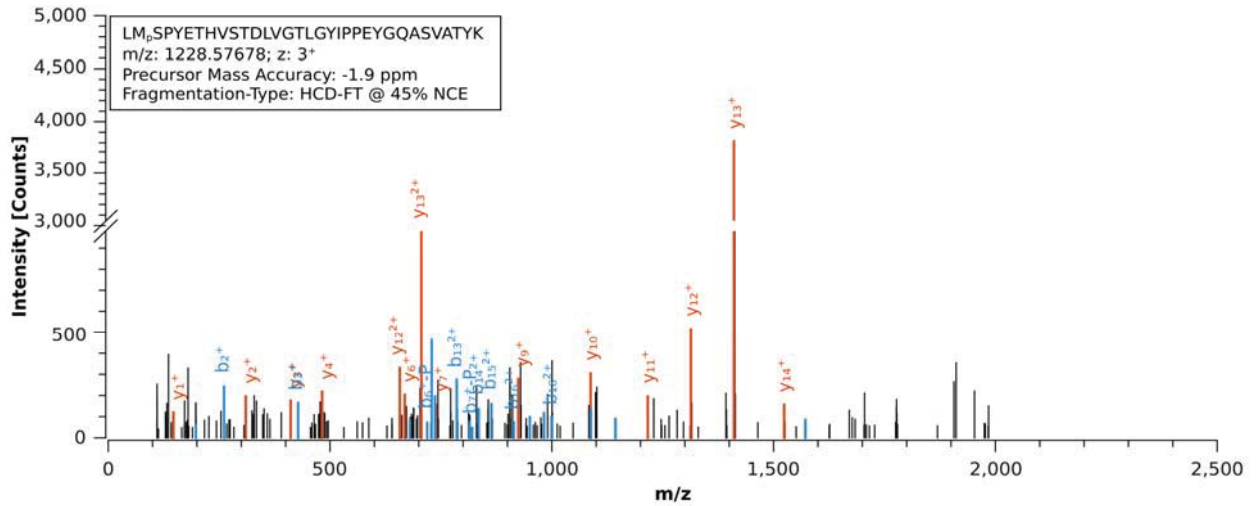
Supplemental Figure S2. LC-ESI MS/MS spectra identifying PSKR1 *in planta* phosphorylation sites.

(A) LC-ESI MS/MS measurement in Orbitrap of the phosphopeptide RSGEVDPEIEESEpSMNRK with a measured m/z value of 724.64, a precursor charge state of 3⁺. The mass deviation was calculated to be -2.3 ppm. The precursor ion was fragmented by Higher Energy Collision activated dissociation (HCD) and analyzed in the Orbitrap mass analyzer (FT). The normalized collision energy was set to 45%. Peptide ions, which were passing the filter settings were annotated in red (y-ions) and blue (b-ions).

(B) LC-ESI MS/MS measurement in Orbitrap of the phosphopeptide SGEVDPEIEESEpSMNRKELGEIGSK with a measured m/z value of 943.75, a precursor charge state of 3⁺. The mass deviation was calculated to be -2.7 ppm. Precursor ion fragmentation and analysis were carried out as described for (A).

Supplemental Figure S2C

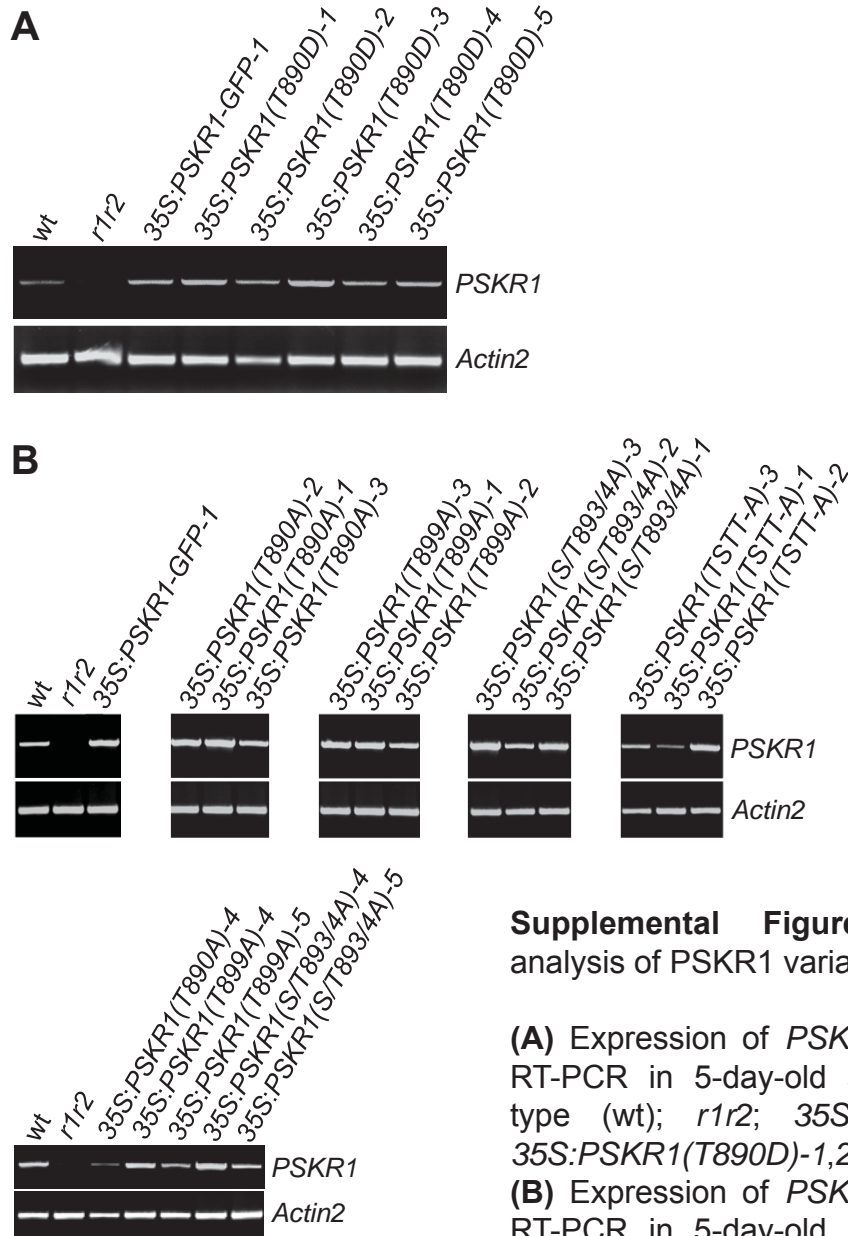
C



Supplemental Figure S2. LC-ESI MS/MS spectra identifying PSKR1 *in planta* phosphorylation sites.

(C) LC-ESI MS/MS measurement in Orbitrap of the phosphopeptide LM_pSPYETHVSTDLVGLGYIPPEYGQASVATYK with a measured m/z value of 1228.57, a precursor charge state of 3⁺. The mass deviation was calculated to be -1.9 ppm. Precursor ion fragmentation and analysis were carried out as described for (A).

Supplemental Figure S3



Supplemental Figure S3. Expression analysis of *PSKR1* variants.

(A) Expression of *PSKR1* was analyzed by RT-PCR in 5-day-old seedlings from wild-type (wt); *r1r2*; *35S:PSKR1-GFP-1* and *35S:PSKR1(T890D)-1,2,3,4,5* lines.

(B) Expression of *PSKR1* was analyzed by RT-PCR in 5-day-old seedlings from wild-type (wt), *r1r2*, *35S:PSKR1-GFP-1*; *35S:PSKR1(T890A)-1,2,3,4*; *35S:PSKR1(T899A)-1,2,3,4,5*; *35S:PSKR1(S/T893/4A)-1,2,3,4,5* and *35S:PSKR1(TSTT-A)-1,2,3* each in the *r1r2* background. *Actin2* cDNA was amplified as a control for RNA input.

Supplemental Figure S4

Species	Accession	Sequence	Accession
<i>Arabidopsis thaliana</i>	681	RARRRSGEVDPEIEESESMMNR-KELGEIGSKLVVLFQSNND-----KELSYDLLLL	729
<i>Physcomitrella patens</i>	1008	RWRLLKQEAIAKTKDLERMKLTVMMEAGACMVIPKSKEPLSINVAMFEQPLLRLTLADILL	1068
<i>Selaginella moellendorffii</i>	719	MLSFSSRAGHRQDIAGRNPKEMSVAQMMDLTVMFGQRYR-----RITVGDLIK	768
<i>Amborella trichopoda</i>	710	RRHRKRKCGDGVCRTAGGIR--RSSEFSGSRMVLFPQDQK-----KELTICDLLK	758
<i>Brachypodium distachyon</i>	718	MKRSFRRQDHTVKAVADTDG--ALELAPASLVLLFQNKDDDD-----KAYTISDILK	766
<i>Oryza sativa</i>	717	LKSSFRQDYIVKAVADITE---ALELAPASLVLLFQNKDDG-----KAMTIGDILK	765
<i>Panicum virgatum</i>	706	RIVHSRMQEPNPKAVANAE---DSESSNSCLVLLFQNN-----KEISIEDILK	750
<i>Setaria italica</i>	717	LKSRFRQDHTVKAVADTDNR--ALELAPASLVLLFQNKDD-----KALTIADILK	764
<i>Sorghum bicolor</i>	715	LKSSFNKQDHTVKAVKDTNQ---ALELAPASLVLLFQDKAD-----KALTIADILK	762
<i>Zea mays</i>	717	LKSNFRQDHTVKAVADTDR---ALELAPASLVLLFQNKAD-----KALTIADILK	764
<i>Aquilegia coerulea</i>	684	TRTDSHKQDHTKVDNFDSSD--NVLYPSGSRVLLFEDEDN-----NNELFIEDLLK	733
<i>Mimulus guttatus</i>	685	VCSCRRRGVDPEMEYERTSSKTDYFETS SVVILCQNKDKD--INISSTSKKEIFLDDLLK	744
<i>Solanum lycopersicum</i>	631	VRASSRKVVDQEKELDASNRE---LEDLGSLLVIFPHNKE-----NTKEMCLDILLK	679
<i>Solanum tuberosum</i>	677	IRASSRKVVDQEKELDASNRE---LEDLGSLLVIFPHNKE-----NTKEMCLDILLK	725
<i>Vitis vinifera</i>	465	IPVVGDFIVDLDEEIEE-RPHR-LS-EVLGSSKLVLFQNSGC-----KDLSDVADLLK	512
<i>Eucalyptus grandis</i>	679	MRAHRRGEVDPEKEVVGRKE--RDI EDLESRLVLMVFQNKDR-----CEKLSYEDISR	728
<i>Populus trichocarpa</i>	693	LRAHNRGEVDPEKEVDADTND--KDLEELGSKLVVLLQNKES-----YKDLSDLEDLLK	742
<i>Linum usitatissimum</i>	719	RRARGDLINSLDEEAEE-ESQR-SS-QALMTSKLVLFQNSDC-----KGLTVDLILLK	766
<i>Manihot esculenta</i>	693	RAHSRGEVDAEKEGVEANTND--KDLEELGSKLVVLFQNKEN-----YRELSLEELLK	742
<i>Ricinus communis</i>	678	LRAHSRGEVDPEKEEPTDND--KDLEELGSKLVVLFQNKEN-----YKELSDLEDLLK	727
<i>Carica papaya</i>	582	LRAHSRGEVDPER-DFDGN--KDLEELGSKLVVLFQNKED-----NKDLSFDLILLK	630
<i>Gossypium raimondii</i>	678	LRTHKRNEVDPEKEEPTDND--KNLEELSSRLVVLFQNWES-----YKELCIDDLLE	727
<i>Theobroma cacao</i>	680	LRAHNRGEVDPEKEEPTDND--KDLEELSSRLVVLFQNRRT-----YKELCIDDLLE	729
<i>Arabidopsis lyrata</i>	681	RARRRSGEVDPEIEESESMMNR-KELGEIGSKLVVLFQSNND-----KELSYDLLLL	729
<i>Arabidopsis thaliana</i>	681	RARRRSGEVDPEIEESESMMNR-KELGEIGSKLVVLFQSNND-----KELSYDLLLL	729
<i>Boechera stricta</i>	691	RARRRSGEVDPEIEESESMMNR-KELGEIGSKLVVLFQSNND-----KELSYDLLLL	739
<i>Brassica rapa</i>	689	HARRRSGEVDPEIEESESMMNR-KDLEEGSKLVVLFQSDS-----KDLSDFDLILLK	736
<i>Capsella grandiflora</i>	675	RARRRSGEVDPEIEESESMMNR-KELGEIGSKLVVLFQSNND-----KELSYDLLLL	723
<i>Capsella rubella</i>	689	RARRRSGEVDPEIEESESMMNR-KELGEIGSKLVVLFQSNND-----KELSYDLLLL	737
<i>Eutrema salsugineum</i>	690	RARRRSGEVDPEIEESESMMNR-KEVEEIGSKLVVLFQSNND-----KDLSDFDLILLK	737
<i>Citrus sinensis</i>	692	LRAHSRGEVDPEKEEANTND--KDLEELGSKLVVLFPHNKE-----KEISIDDLLE	739
<i>Citrus clementina</i>	692	LRAHSRGEVDPEKEEANTND--KDLEELGSKLVVLFPHNKE-----KEISIDDLLE	739
<i>Cucumis sativus</i>	366	LRPPRGRVGDPEVEEENIDN--KDLEEVKTGLVLFQNNND-----GSLSDLEDLLK	414
<i>Glycine max</i>	724	KRDDDKPMDNFDDELNGRPRR-LS-EALASKLVLFQNSDC-----KDLTVADLILLK	772
<i>Malus domestica</i>	688	VRAHSRREVDPEREDHDTNG--KDLEELGSKLVVLFQNKDA-----NKELSDLDDLQ	737
<i>Medicago truncatula</i>	720	KREEDKPIDSDPEEMGRPR-LSSEGFVASKLVLFQNSDC-----KDLTVSDLILLK	769
<i>Phaseolus vulgaris</i>	720	RRDDDKPIDNDEELNGRPHR-LS-EALVSSKLVLFQNSDC-----KDLTVADLILLK	711
<i>Prunus persica</i>	689	LRAHSRREVDPEKEEYDSDNG--KDLEELGSKQVLFQNKDT-----DKELSDLDDLQ	738

ATP binding region

Species	Accession	Sequence	Accession
<i>A. thaliana</i>	730	STNSFDQANI ICGGFGMVKYKALLPDGKVAIKKLSGD--CGIEREFQAEVETLSRAQHPNLVLLRGFCFYKN-DRLLIYSYMENGLDYLWHERND	824
<i>P. patens</i>	1069	ATNNFCKTNI IGDGGFGTVYKAVLPDTRKVAIAKLLGAS--RSQGNREFLAEMETLGKVKHRLVPLLGYSFGE-EKLLVYEMVNGSLDYLWLRNRAD	1164
<i>S. moellendorffii</i>	769	ATNNFDATNI ICGGFGLVKFNALPDGRKVAIAKRLTSEDGGPQMEKEFDALSTLGNITHPNLVSLRGYCRGLMRDRLLVYSYMENGLDYLWHERSD	866
<i>A. trichopoda</i>	759	ATDNFDQANI ICGGFGLVYKALLPDGRKVAIAKRLSGD--CGQMDREFQAEVESLSRAQHKNLVLLQGYCRHGD-DRLLIYSYMENGLDYLWHERLD	853
<i>B. distachyon</i>	767	STNNFDQANI ICGGFGLVYKALLPDGATIAIKRLSGG--FGQMEREFKAEVETLSKAKHRLVLLQGYCRVGS-DRLLIYSYMENGLDYLWHEKPD	861
<i>O. sativa</i>	766	STNNFDQANI ICGGFGLVYKALLPDGATIAIKRLSGD--FGQMEREFKAEVETLSKQHPNLVLLQGYCYRIGN-DRLLIYSYMENGLDHLWHEKPD	860
<i>P. virgatum</i>	751	STNNFDQAY IVCGGFGLVYKSLPDGRVAIAKRLSGD--YSQIEREFQAEVETLSRAQHDNLVLLQGYCKVGN-DRLLIYSYMENGLDYLWHERAD	845
<i>S. italica</i>	765	STNNFDQANI ICGGFGLVYKALLPDGATIAIKRLSGD--FGQMEREFKAEVETLSKQHPNLVLLQGYCYRIGS-DRLLIYSYMENGLDHLWHEPN	859
<i>S. bicolor</i>	763	STNNFDQANI ICGGFGLVYKALPDGAAIAIKRLSGD--FGQMEREFKAEVETLSKQHPNLVLLQGYCYRIGS-DRLLIYSYMENGLDHLWHEKPD	857
<i>Z. mays</i>	765	STNNFDQANI ICGGFGIVYKALPDGAAIAIKRLSGD--FGQMEREFKAEVETLSKQHPNLVLLQGYCYRIGS-DRLLIYSYMENGLDHLWHEKPD	859
<i>A. coerulea</i>	734	STNNFDQANI ICGGFGLVYKALLPDGRKVAIAKRLSGD--CGQMEREFQAEVETLSRAQHNLVLLQGYCCKN-DRLLIYSYMENGLDYLWHEKLD	828
<i>M. guttatus</i>	745	ATNNFDQANI ICGGFGLVYKAVLSDGRKVAIAKRLSGD--FGQMEREFKAEVETLSKQHPNLVLLQGYCCKYK-DRLLIYSYMENGLDYLWHEKVD	839
<i>S. lycopersicum</i>	680	CTDNFDQSNIVCGGFGLVYKALLRDGRKVAIAKRLSGD--YQQMEREFQAEVESLSRAQHPNLVHLQGYCYKRT-DRLLIYSYMENGLDYLWHEKVD	774
<i>S. tuberosum</i>	726	CTDNFDQSNIVCGGFGLVYKALLRDGRKVAIAKRLSGD--YQQMEREFQAEVESLSRAQHPNLVHLQGYCCKHRT-DRLLIYSYMENGLDYLWHEKVD	820
<i>V. vinifera</i>	513	STNNFDQANI ICGGFGLVYKANLPDGRKVAIAKRLSGD--CGQMEREFQAEVETLSRAQHPNLVLLQGYCYRIGN-DRLLIYSYMENGLDYLWHERVD	607
<i>E. grandis</i>	729	ATNNFDQANI ICGGFGMVKYKALFPDGTKLAIAKLLSGD--CGQMEREFQAEVETLSRAQHPNLVLLQGYCMTD-DRLLIYSYMENGLDYLWHEKPD	823
<i>P. trichocarpa</i>	743	FTNNFDQANI ICGGFGLVYKALLPDGRKVAIAKRLSGD--SGQMDREFQAEVETLSRAQHPNLVHLQGYCMLKN-DRLLIYSYMENGLDYLWHEKLD	837
<i>L. usitatissimum</i>	767	ATNNFDQANI ICGGFGLVYKALPDGRKVAIAKRLSGD--CGQMDREFQAEVETLSRAQHPNLVLLQGYCCKHGS-DRLLIYSYMENGLDYLWHEKVD	861
<i>M. esculenta</i>	743	STNNFDQANI ICGGFGLVYKALLPDGRKVAIAKRLSGD--CGQMEREFQAEVETLSRAQHPNLVHLQGYCMFKA-DRLLIYSYMENGLDYLWHEKID	837
<i>R. communis</i>	728	STNNFDQANI ICGGFGLVYKALLPDGRKVAIAKRLSGD--CGQMEREFQAEVETLSRAQHPNLVHLQGYCMFKN-DRLLIYSYMENGLDYLWHEKID	822
<i>C. papaya</i>	631	STNNFDQANI ICGGFGLVYKALLPDRKVAIAKRLSGD--CGQMDREFQAEVETLSRAQHPNLVLLQGYCMHKN-DRLLIYSYMENGLDYLWHEKID	725
<i>G. raimondii</i>	728	STNNFDQANI ICGGFGLVYKALLPDGRKVAIAKRLSGD--CGQMDREFQAEVETLSRAQHPNLVHLQGYCMHKN-DRLLIYSYMENGLDYLWHEKVD	822
<i>T. cacao</i>	730	STNNFDQANI ICGGFG-----GLMDREFQAEVETLSRAQHPNLVHLQGYCMHKG-DRLLIYSYMENGLDYLWHEKVD	801
<i>A. lyrata</i>	730	STNSFDQANI ICGGFGMVKYKALLPDGKVAIAKLLSGD--CGQIEREFQAEVETLSRAQHPNLVLLRGFCFYKN-DRLLIYSYMENGLDYLWHERND	824
<i>A. thaliana</i>	730	STNSFDQANI ICGGFGMVKYKALLPDGKVAIAKLLSGD--CGQIEREFQAEVETLSRAQHPNLVLLRGFCFYKN-DRLLIYSYMENGLDYLWHERND	824
<i>B. stricta</i>	740	STNSFDQANI ICGGFGMVKYKALLPDGKVAIAKLLSGD--CGQIEREFQAEVETLSRAQHPNLVLLRGFCFYKN-DRLLIYSYMENGLDYLWHERND	834
<i>B. rapa</i>	737	STNNFDQANI ICGGFGLVYKALPDGRKVAIAKRLSGD--CGQIEREFQAEVETLSRAQHPNLVLLQGYCFYKT-DRLLIYSYMENGLDYLWHERND	831
<i>C. grandiflora</i>	724	STNSFDQANI ICGGFGMVKYKALLPDGKVAIAKLLSGD--CGQIEREFQAEVETLSRAQHPNLVLLRGFCFYRN-DRLLIYSYMENGLDYLWHERND	818
<i>C. rubella</i>	738	STNSFDQANI ICGGFGMVKYKALLPDGKVAIAKLLSGD--CGQIEREFQAEVETLSRAQHPNLVLLRGFCFYRN-DRLLIYSYMENGLDYLWHERND	832
<i>E. salsugineum</i>	738	STNNFDQANI ICGGFGLVYKALLPDGRKVAIAKRLSGD--CGQIEREFQAEVETLSRAQHPNLVLLQGYCFYKT-DRLLIYSYMENGLDYLWHERND	832
<i>C. sinensis</i>	740	STNNFDQANI ICGGFGLVYKALLPDGRNVAIAKRLSGD--CGQMEREFQAEVETLSRAQHPNLVHLQGYCMHKN-DRLLIYSYMENGLDYLWHEKLD	834
<i>C. clementina</i>	740	STNNFDQANI ICGGFGLVYKALLPDGRNVAIAKRLSGD--CGQMEREFQAEVETLSRAQHPNLVHLQGYCMHKN-DRLLIYSYMENGLDYLWHEKLD	834
<i>C. sativus</i>	415	STNNFDQANI ICGGFGLVYKALPDGRKVAIAKRLSGD--CGQMEREFQAEVETLSRAQHPNLVLLQGYCYRIGN-DRLLIYSYMENGLDYLWHEKPD	509
<i>G. max</i>	773	STNNFDQANI ICGGFGLVYKALPNGKAAVRLSGD--CGQMEREFQAEVETLSRAQHPNLVSLKGYCRHGN-DRLLIYSYLENGSLDYLWHEKVD	867
<i>M. domestica</i>	738	STNNFDQANI ICGGFGLVYKALPDGKVAIAKRLSGD--CGQMDREFQAEVETLSRAQHPNLVPLQGYCYTYKS-DRLLIYSYMENGLDYLWHEKID	832
<i>M. truncatula</i>	770	ATSNFNQANI ICGGFGLVYKALPNGKAAVRLSGD--CGQMEREFQAEVETLSRAQHPNLVSLKGYCRHGN-DRLLIYSYLENGSLDYLWHEKVD	864
<i>P. vulgaris</i>	769	STNNFDQANI ICGGFGLVYKALPNGKAAVRLSGD--CGQMEREFQAEVETLSRAQHPNLVSLKGYCRHGN-DRLLIYSYLENGSLDYLWHEKID	863
<i>P. persica</i>	739	STNNFDQANI ICGGFGLVYKALLPDGKVAIAKRLSGD--CGQMDREFQAEVETLSRAQHPNLVHLQGYCYTYKS-DRLLIYSYMENGLDYLWHEKID	833

		CaM binding site		Activation segment					
<i>A. thaliana</i>	825	GPALLKWKTRLR	IAQGAAGLLYLHEGCDPHILHRDIKS	SNILLDENFN	SHLADFLGLARLMS-PYE	THVSTDLV	GLYIPPEYQA	AVATYKGDVY	920
<i>P. patens</i>	1165	AVEHLDWAKRFK	IAMGSRGLNLFHHGFIPHIHRDIKA	NVLLDADFE	PRVADFLGLARLIS-AYE	THVSTDL	GLYIPPEYQ	SWRSTTRGDVY	1260
<i>S. moellendorffii</i>	867	GGSRLLWRHRL	LAIRLRETARGLLEYLHRGNPHIVHRDIKS	SNILLDGLD	RAHVADFLGLARLML-PSD	THVSTDL	GLYIPPEYA	QASLEASLRGDVY	962
<i>A. trichopoda</i>	854	GGSMLDWASRL	MAQGAAGHGLAYLHQTCENPILHRDIKS	SNILLDEEF	EAHLADFLGLARLIL-PYD	THVSTDL	GLYIPPEYQ	AVATFKGDVY	949
<i>B. distachyon</i>	862	GPKLSWQRR	LQIAKGAARGLAYLHLSCQPHILHRDIKS	SNILLDENF	EAQLADFLGLARLIC-PYD	THVSTDL	GLYIPPEYQ	AVATFKGDVY	957
<i>O. sativa</i>	861	GPSRLSWQTR	LQIAKGAARGLAYLHLSCQPHILHRDIKS	SNILLDEDF	EAHLADFLGLARLIC-PYD	THVSTDL	GLYIPPEYQ	AVANFKGDVY	956
<i>P. virgatum</i>	846	GAYALDWTR	LRIAQGAARGLAYLHMSCDPHILHRDIKS	SNILLDENF	EAHLADFLGLARLIC-AYE	THVSTDL	GLYIPPEYQ	ASVPATYKGDY	941
<i>S. italica</i>	860	GPSRLIWP	RQLQIAKGAARGLAYLHLSCQPHILHRDIKS	SNILLDENF	EAHLADFLGLARLIC-PYA	THVSTDL	GLYIPPEYQ	AVATFKGDVY	955
<i>S. bicolor</i>	858	GPSRLIWP	RQLQIAKGAARGLAYLHLSCQPHILHRDVKS	SNILLDENF	EAHLADFLGLARLIC-PYA	THVSTDL	GLYIPPEYQ	AVATFKGDVY	953
<i>Z. mays</i>	860	GPSRLIWP	RQLQIAKGAARGLAYLHLSCQPHILHRDIKS	SNILLDENF	EAHLADFLGLARLIC-PYA	THVSTDL	GLYIPPEYQ	AVATFKGDVY	955
<i>A. coerulea</i>	829	GAYALDWTR	LRIAQGAARGLAYLHQSCPHILHRDVKS	SNILLDENF	VAHLADFLGLARLIL-PYD	THVSTDL	GLYIPPEYQ	AVATFKGDVY	924
<i>M. guttatus</i>	840	GPTSLDWET	RNLIAKGAARGLAYLHQSCPHILHRDIKS	SNILLNEKF	EAHLADFLGLARLIL-PYD	THVSTDL	GLYIPPEYQ	AVATYKGDVY	935
<i>S. lycopersicum</i>	775	GPALLDWD	LRLQIAQGAARGLAYLHLACPHILHRDIKS	SNILLDENF	EAHLADFLGLARIIR-PYD	THVSTDL	GLYIPPEYQ	AVATYKGDVY	870
<i>S. tuberosum</i>	821	GPALLDWD	LRLQIAQGAARGLAYLHLACDPHILHRDIKS	SNILLDENF	EAHLADFLGLARIIR-PYD	THVSTDL	GLYIPPEYQ	AVATYKGDVY	916
<i>V. vinifera</i>	608	GSMLLDWTR	LRIAQGAARGLAYLHQSCPHILHRDIKS	SNILLDENF	EAHLADFLGLARLLR-PYD	THVSTDL	GLYIPPEYQ	ASQTATFKGDVY	703
<i>E. grandis</i>	824	GPCLLDWCK	RRLRIAQGAARGLAYLHQSCPHIVHRDVKS	SNILLDGNF	EAHLADFLGLARLIR-AYD	THVSTDL	GLYIPPEYQ	AVATCKGDVY	919
<i>P. trichocarpa</i>	838	GPSSLDWTR	LQIAQGAARGLAYLHQSCPHIVHRDIKS	SNILLDENF	VAHLADFLGLARLIL-PYD	THVSTDL	GLYIPPEYQ	AAVATYMGDVY	933
<i>L. usitatissimum</i>	862	GPSVLQW	EARLKIAGKAAGLAYLHKVCEPHIVHRDVKS	SNILLDDKF	EAHLADFLGLARLLR-PYD	THVSTDL	GLYIPPEYQ	ASQTATCRGDVY	957
<i>M. esculenta</i>	838	GPSMLDWTR	LRIAQGAARGLAYLHQSCPHILHRDIKS	SNILLDENF	EAHLADFLGLARLIL-PSD	THVSTDL	GLYIPPEYQ	AVATYKGDVY	933
<i>R. communis</i>	823	GPTLLDWV	TRLQIAQGAARGLAYLHQSCPHILHRDIKS	SNILLNENF	EAHLADFLGLARLIL-PYD	THVSTDL	GLYIPPEYQ	AVATYKGDVY	918
<i>C. papaya</i>	726	GLSSLDWN	TRIQIAGAARGLAYLHQSCPHILHRDIKS	SNILLDENF	EAHLADFLGLARLIL-PYD	THVSTDL	GLYIPPEYQ	AVATYKGDVY	821
<i>G. raimondii</i>	823	GPSLLSWET	RKLIAQGAARGLAYLHQSCPHILHRDIKS	SNILLDENF	KAHLADFLGLARLIL-PYD	THVSTDL	GLYIPPEYQ	AVATYKGDVY	918
<i>T. cacao</i>	802	GPSLLDWTR	LQIALGAARGLAYLHQSCPHILHRDIKS	SNILLDENF	EAHLADFLGLARLIL-PYD	THVSTDL	GLYIPPEYQ	AVATYKGDVY	897
<i>A. lyrata</i>	825	GPALLKWR	TRLRIAQGAAGLLYLHEGCDPHILHRDIKS	SNILLDENF	FNHLADFLGLARLMS-PYE	THVSTDL	GLYIPPEYQ	AVATYKGDVY	920
<i>A. thaliana</i>	825	GPALLKWK	TRLRIAQGAAGLLYLHEGCDPHILHRDIKS	SNILLDENF	FNHLADFLGLARLMS-PYE	THVSTDL	GLYIPPEYQ	AVATYKGDVY	920
<i>B. stricta</i>	835	GPALLKWK	TRLRIAQGAAGLLYLHEACDPHILHRDIKS	SNILLDENF	DSHLADFLGLARLLS-PYE	THVSTDL	GLYIPPEYQ	AVATYKGDY	930
<i>B. rapa</i>	832	GPALLDWTR	LRIAQGAARGLAYLHQSCPHILHRDIKS	SNILLDENF	EAHLADFLGLARLMS-PYE	THVSTDL	GLYIPPEYQ	AVATYKGDVY	927
<i>C. grandiflora</i>	819	GPALLNWR	TRLRIAQGAAGLLYLHEACDPHILHRDIKS	SNILLDENF	TSHLADFLGLARLMS-PYE	THVSTDL	GLYIPPEYQ	AVATYKGDY	914
<i>C. rubella</i>	833	GPALLNWR	TRLRIAQGAAGLLYLHEACDPHILHRDIKS	SNILLDENF	TSHLADFLGLARLMS-PYE	THVSTDL	GLYIPPEYQ	AVATYKGDY	928
<i>E. salusigneum</i>	833	GPALLDWTR	LRIAQGAARGLAYLHQSCPHILHRDIKS	SNILLDENF	EAHLADFLGLARLMS-PYE	THVSTDL	GLYIPPEYQ	AVATYKGDVY	928
<i>C. sinensis</i>	835	GPSLLDWTR	LRIAQGAARGLAYLHQSCPHILHRDIKS	SNILLDGNF	EAHLADFLGLARLILSPYD	THVSTDL	GLYIPPEYQ	AVATYKGDVY	931
<i>C. clementina</i>	835	GPSLLDWTR	LRIAQGAARGLAYLHQSCPHILHRDIKS	SNILLDGNF	EAHLADFLGLARLILSPYD	THVSTDL	GLYIPPEYQ	AVATYKGDVY	931
<i>C. sativus</i>	510	GSSCLDWTR	LQIARGAAGLAYLHQSCPHILHRDIKS	SNILLDKNF	KAHLADFLGLARLIL-PYD	THVSTDL	GLYIPPEYQ	AVATYRGDVY	605
<i>G. max</i>	868	ENSALKWDS	RLKVAQGAARGLAYLHKCEPPIVHRDVKS	SNILLDDNF	EAHLADFLGLARLLQ-PYD	THVSTDL	GLYIPPEYQ	ASQTATATFRGDVY	963
<i>M. domestica</i>	833	GPTSLDWTR	LRIAQGAARGLAYLHQSCPHILHRDIKS	SNILLDENF	KAHLADFLGLARLIH-PYA	THVSTDL	GLYIPPEYQ	AVATYKGDVY	928
<i>M. truncatula</i>	865	GNSALKWDR	LKIAQGAARGLAYLHKCEPPIVHRDIKS	SNILLDKNF	EAHLADFLGLARLLS-PYD	THVSTDL	GLYIPPEYQ	ASQTATATFRGDVY	960
<i>P. vulgaris</i>	864	ESALKWDAR	LKIAQGAARGLAYLHKCEPPIVHRDVKS	SNILLDDKF	EAHLADFLGLARLLQ-PYD	THVSTDL	GLYIPPEYQ	ASQTATATFRGDVY	959
<i>P. persica</i>	834	GPSLLDWN	MRLQIAQGAARGLAYLHQSCPHILHRDIKS	SNILLDENF	KAHLADFLGLARLIL-PYD	THVSTDL	GLYIPPEYQ	AVATYKGDVY	929

		GC centre		
<i>A. thaliana</i>	921	SFGVLLLELL	TDKRP--VDMCKPKGCRDLISWVVKMKHEPRASEVFDPLIYSKENDK---EMFRVLEIACLCLSENPKQRPTIQQLVSWLDDV	1008
<i>P. patens</i>	1261	SYGVILLELL	TGKEPTGSDVKDYHEGGLNVQWARQMIKAGNAADVLDPIVSDGPWKC---KMLKVLHIANMCTAEDPVKRPMSLQVVKLLKDV	1350
<i>S. moellendorffii</i>	963	SFGVLLVLE	VLRRRP--VDACRRGGIRDLPVWVEGMQATGRGIEIVDPLLLQNYSEVDALEEMLRVLDVACVYCDSCQRRPGIEEVAWLDVAV	1054
<i>A. trichopoda</i>	950	SFGVLLLELL	TGKRP--VDVCKPKGCRDLISWVILQKSEGREEVDFPFYDKKHDK---QMLQMLEVACSLCNVACPARKPFTICQVSWLSDSI	1037
<i>B. distachyon</i>	958	SFGVLLLELL	TGKRP--VDMCKPKGARELISWVIMHKGENREADVLDAMYKKEKYEI---QMMKMIACLCISSEPKLRPLSHLVLWIDTI	1045
<i>O. sativa</i>	957	SFGVLLLELL	TGKRP--VDMCKPKGARELISWVLMHMEKNECEAEVLDAMYDKKFKEM---QMVQMIACLCISSEPKLRPLSHLVLWLDNI	1044
<i>P. virgatum</i>	942	SFGVLLLELL	TGRRP--VDMCRPKGTRDVLVSWVLMQKEEGRETEVFFHPSIHHKENES---QLIRVLEIACLCVSAAPKSRPTIQQLVWLDVI	1029
<i>S. italica</i>	956	SFGVLLLELL	TGKRP--VDMCKPKGARELISWVTHMKENRETVDLDRAMYDKKFEK---EMMQMIDVACLCVSDSPKLRPLSHLVLWLDNI	1043
<i>S. bicolor</i>	954	SFGVLLLELL	TGKRP--VDMCKPKGARELISWVTHMKENREADVLDAMYDKKFKET---QMIQMIACLCISSEPKLRPLSHLVLWLDNI	1041
<i>Z. mays</i>	956	SFGVLLLELL	TGKRP--IDMCKPKGARELISWVTLMKENREADVLDAMYDKKFKET---QMRQVIDIACLCVSDSPKLRPLSHLVMWLDNI	1043
<i>A. coerulea</i>	925	SFGVLLLELL	TGKRP--MDMCKPKDRRLNISWVFMKKEKREAEVIDPFIYDKQHDK---EILRALEIACLCISESPKVRPSIQQIVSWLNI	1012
<i>M. guttatus</i>	936	SFGVLLLELL	TGKRP--MDMCKPKGCRDLISWVIRMKENRESEVDFPFYDKKHDK---EMLRKRW-----EMLRKRW-----	992
<i>S. lycopersicum</i>	871	SFGVLLLELL	TCKRP--MDPCKPRASDLISWVIQMKKQKRETEVDFPLIYDKQHAK---EMLLVLEIACLCISESPKIRPSSIQQLVWLDNI	958
<i>S. tuberosum</i>	917	SFGVLLLELL	TCKRP--MDPCKPRASDLISWVIQMKKQKRETEVDFPLIYDKQHAK---EMLLVLEIACLCISESPKIRPSSIQQLVWLDNI	1004
<i>V. vinifera</i>	704	SFGVLLLELL	TGRRP--VEVCKGKNCRDLSWVFMKSEKKEEQIMDSVWVDKREK---QFLEVLIACRCIDQDPQRPSIDQVSWLDVAV	791
<i>E. grandis</i>	920	SFGVLLLELL	TGKRP--MDMCKPKGSRDLISWVIRMKENRESEVDFPFYDKQHDK---EILRVEIACLCISESPKVRPSIQQLVSWLDG-	1006
<i>P. trichocarpa</i>	934	SFGVLLLELL	TGKRP--MDMCKPKGSRDLISWVIQMKKENRESEVDFPFYDKQHDK---ELQRVLEIARLCLSEYPKLRPSIQQLVSWLDNI	1021
<i>L. usitatissimum</i>	958	SFGVLLLELL	TCKRP--VEVCKGKSCRDLSWVFMKFEKRVSEIIDASVWVDKQDEK---QLVEMLEIACRCIDHERRRPFIEEVSCLDGI	1045
<i>M. esculenta</i>	934	SFGVLLLELL	TGKRP--MDMCKPKGSRDLISWVIQMKKENRESEVDFPFYDKQHDK---QLLQVFDIACLCISESPKVRPSITQLVSWLENT	1021
<i>R. communis</i>	919	SFGVLLLELL	TGKRP--MDMCKPKGSRDLISWVIQMKKENRESEVDFPFYDKQHDK---QLLQVLDIACLCISESPKVRPSITQLVSWLDGI	1006
<i>C. papaya</i>	822	SFGVLLLELL	TGKRP--MDMCKPKGSRDLISWAIQMKKENRESEVDFPFYDKQHDK---EMCLVLIACLCISECPKVRPTIQQLVSWLDNI	909
<i>G. raimondii</i>	919	SFGVLLLELL	TGKRP--MDMCKPKGTRDLISWVIRMKMENRESEVDFPFYDKQHDK---EMLRILEIACLCISESPKIRPTIQQLVYWLKDV	1006
<i>T. cacao</i>	898	SFGVLLLELL	TGKRP--MDMCKPKGSRDLISWVIRMKIENRESEVDFPFYDKQHDK---EMLRVEIACLCISESPKVRPTIQQLVSWLCKV	985
<i>A. lyrata</i>	921	SFGVLLLELL	TDKRP--VDMCKPKGCRDLISWVVKMKHENRASEVDFPLIYSKENDK---EMFRVLEITCLCLSENPKQRPTIQQLVSWLDDV	1008
<i>A. thaliana</i>	921	SFGVLLLELL	TDKRP--VDMCKPKGCRDLISWVVKMKHEPRASEVFDPLIYSKENDK---EMFRVLEIACLCISESPKQRPTIQQLVSWLDDV	1008
<i>B. stricta</i>	931	SFGVLLLELL	TDKRP--VDMCKPKGCRDLISWVVKMKHENRASEVDFPLIYSKENDK---EMFRVLEIACLCISESPKQRPTIQQLVSWLHDV	1018
<i>B. rapa</i>	928	SFGVLLLELL	TDKRP--VDMCKPKGARELISWVVKMKSEGRASEVDFPFYDKQVNEE---EMFRVLEIACLCISESHNPKLRPTIQQLVSWLDDV	1015
<i>C. grandiflora</i>	915	SFGVLLLELL	TGKRP--VDMCKPKGSRDLISWVVKMKHENRASEVDFPLIYSKENEK---EMLRVEIACLCISESPKVRPTIQQLVSWLDDV	1002
<i>C. rubella</i>	929	SFGVLLLELL	TDKRP--VDMCKPKGSRDLISWVVKMKYENRASEVDFPLIYSKENEK---EMLRVEIACLCISESPKVRPTIQQLVSWLDDV	1016
<i>E. salusigneum</i>	929	SFGVLLLELL	TDKRP--VDMCKPKGSRDLISWVVKMKHENRASEVDFPLIYSKENEK---EMLRVEIACLCISESPKVRPTIQQLVSWLDDV	1016
<i>C. sinensis</i>	932	SFGVLLLELL	TGKRP--MDMCKPKGSRDLISWVIRMQENRESEVDFPFYDKQHDK---EMLRVLDIACLCISESPKVRPTIQQLVSWLSDI	1019
<i>C. clementina</i>	932	SFGVLLLELL	TGKRP--MDMCKPKGSRDLISWVIRMQENRESEVDFPFYDKQHDK---EMLRVLDIACLCISESPKVRPTIQQLVSWLSDI	1019
<i>C. sativus</i>	606	SFGVLLLELL	TGKRP--IDMCRPKGLRDLISWVFMKDKKVESEVDFPFYDKQVNEE---AMVEVLDIACLCISECPKVRPSIQQLVWLDK	693
<i>G. max</i>	964	SFGVLLLELL	TGRRP--VEVIKGNCRNLVSWVYQMKSENKEQIFDPFVIYDKHDEK---QLLEVLAIACCLNQDPRQRPSIEIVVSWLSDV	1051
<i>M. domestica</i>	929	SFGVLLLELL	TGKRP--MDMCKPKCRDLISWVFMKREKKESEVDFPFYDKQHDK---ELLCVFEIACLCISESPKVRPSIQQLVWLDNI	1016
<i>M. truncatula</i>	961	SFGVLLLELL	TARRP--VEVVIKGNCRNLVSWVYQMKYENKEQIFDQTIWEKREK---QLLEVLAIACCLNQDPRQRPSIEIVVSWLSDV	1048
<i>P. vulgaris</i>	960	SFGVLLLELL	TGRRP--VEVIKGNCRNLVSWVYQMKSENKEQIFDPAIYDKHDEK---QLLEVLAIACCLNQDPRQRPSIEIVVSWLSDV	1047

<i>A. thaliana</i>		-----	
<i>P. patens</i>	1351	EMSSQLSTHDDAQ-----	1363
<i>S. moellendorffii</i>	1055	GSSRLKVGLGKP-----	1066
<i>A. trichopoda</i>	1038	GADSQQT-----	1045
<i>B. distachyon</i>	1046	DTSGEAIN-----	1053
<i>O. sativa</i>	1045	GGSTEATK-----	1052
<i>P. virgatum</i>	1030	AEDSVLEQPEVSGGFNLLA-----	1048
<i>S. italica</i>	1044	GVSSDAPK-----	1051
<i>S. bicolor</i>	1042	GVTS DAPK-----	1049
<i>Z. mays</i>	1044	GVTSDEPK-----	1051
<i>A. coerulea</i>	1013	DTYGP-----	1017
<i>M. guttatus</i>		-----	
<i>S. lycopersicum</i>	959	NTPPDVHVF-----	967
<i>S. tuberosum</i>	1005	NTPPDVHVF-----	1013
<i>V. vinifera</i>	792	GKEGVLPLFIAFEISSFSFFLS-----	813
<i>E. grandis</i>		-----	
<i>P. trichocarpa</i>	1022	DTNT-----	1025
<i>L. usitatissimum</i>	1046	GDT-----	1048
<i>M. esculenta</i>	1022	DISTA-----	1026
<i>R. communis</i>	1007	DNT-----	1010
<i>C. papaya</i>	910	ETTSSILIM-----	918
<i>G. raimondii</i>	1007	TSLSSV-----	1012
<i>T. cacao</i>	986	DISI-----	989
<i>A. lyrata</i>		-----	
<i>A. thaliana</i>		-----	
<i>B. stricta</i>		-----	
<i>B. rapa</i>		-----	
<i>C. grandiflora</i>		-----	
<i>C. rubella</i>		-----	
<i>E. salsugineum</i>		-----	
<i>C. sinensis</i>	1020	I-----	
<i>C. clementina</i>	1020	I-----	
<i>C. sativus</i>	694	TFYNQPYTPHNKFFVSLVYISTFFSSLN	721
<i>G. max</i>	1052	RFDGSQQ-----	1058
<i>M. domestica</i>	1017	NTKKV-----	1021
<i>M. truncatula</i>	1049	KVDGFQQ-----	1055
<i>P. vulgaris</i>	1048	RFDGSQQ-----	1054
<i>P. persica</i>	1018	STKN-----	1021

Supplemental Figure S4. Alignment of PSKR1 orthologs from higher plants and mosses. The intracellular sequences from 37 LRR-RLKs with highest similarity to Arabidopsis PSKR1 were identified from the Phytozome database. The positions of the phosphorylation sites identified in *Arabidopsis thaliana* PSKR1 are indicated. Green denotes sites identified in PSKR1 *in planta* and magenta those identified *in vitro*. Indicated in blue is the T890 that is also transphosphorylated by *E. coli*. Squares indicate unambiguous residues whereas circles indicate phosphorylation sites whose position was not confirmed. Red indicates a conserved residue at the respective position in PSKR1 orthologs and yellow a functionally conserved S/T or Y residue in PSKR1 orthologs.

Supplemental Figure S5

<i>Arabidopsis thaliana</i>	PSKR1	681	RARRRSGEVDPPEI---EES SSM -----NRKELGEIGSKLVVLFQ S ---NDKELSYDLLLLD	729
<i>Physcomitrella patens</i>		817	EVEAKDLEKAKLNMNMTLDPCS----LSLDKMKEPLSINVAMFEQ--PLLRLTLADVLR	869
<i>Selaginella moellendorffii</i>		721	SFSRRAR-AGHRQD----IAGRN----FKEMSVQMMDLTVMFQ--RYRRITVGDLLK	768
<i>Amborella trichopoda</i>		650	HMSRKE--ERYQNGEVVDSR----SHRPSEFSGSKLVLLFQ N -PEGMELTINDLLK	700
<i>Brachypodium distachyon</i>		690	NISKGE--ASAI S D---EDAEG----DCHDPYYSYKPVLF F EN-S-AKELTVSDLLK	736
<i>Oryza sativa</i>		711	NISKRE--VSIIDD---EEING----SCHDSYD-YWKPVLFFQD-S-AKELTVSDLLK	756
<i>Panicum virgatum</i>		586	NMSKRE--VSAIDY---EDTEG----SCHELYDSYLKPVLF F Q N -SAVKELTVSDLV R	633
<i>Setaria italica</i>		695	NMSKRE--VSAIDY---EETEG----SCHELYDSYKPVLF F Q N -SAVKELTVSDLV R	742
<i>Sorghum bicolor</i>		703	NMSKRE--VTAIDY---EDTEG----SSHELYDTYKPVLF F Q N -STVKELTVSDLV R	750
<i>Zea mays</i>		696	NMSKRE--VSAIEHE--EDTEG----SCHELYGSYKPVLF F Q N -SAVKELTVSDLV R	744
<i>Aquilegia coerulea</i>		713	KISRKD-VRY P MD---DVEENF-CRSNRFS-EALGSSKLV L FQ N -SESKELTIGD L LK	764
<i>Mimulus guttatus</i>		702	RVSRKD-NRAPVE---DLEEEED-----SRTTGQPK-MVIFKN-ADFKDLTVSD L LK	747
<i>Solanum lycopersicum</i>		685	RVSRRD-AGHQIG---DFEEDFSR--PPRSSDTFV P SK-LVLFQ N -SDCKELTVAD L LK	735
<i>Solanum tuberosum</i>		712	RVSRRD-AGHQIG---DFEEDFSR--PPRSSDTFV P SK-LVLFQ N -SDCKELTVAD L LK	762
<i>Vitis vinifera</i>		462	EVYIPY-VGDPIV---DLDEEIT-SRPHRLS-EVLGSSK-LVLFQ N -SGCKDLTVAD L LK	512
<i>Eucalyptus grandis</i>		715	KILRRD-VNDHID---DLHEEL-GRPHRLS-GTLESSK-LVLF P N-SDCKDLTVAD L LK	765
<i>Populus trichocarpa</i>		715	KMSRRN-VGDP I G---DLEEEG- S LPHRLS-EALRSSK-LVLFQ N -SDCKELSVAD L LK	765
<i>Linum usitatissimum</i>		716	MMSRRA-RGDLIN---NLDEEG-SESQRSS-QALMTSK-LVLFQ N -SDCKDLTV D L L K	766
<i>Manihot esculenta</i>		716	KMSKRD-VGDP I E---DLDEEV-SWPHRLS-EGLGSSK-LVLFQ N -SECKDLTVAD L LK	766
<i>Ricinus communis</i>		714	KISRDRYVGD P FD---DLDEEV-SRPHRLS-EALGSSK-LVLFQ N -SDCKDLTVAD L LK	765
<i>Carica papaya</i>		583	RAHSR-GEVDPER---DFDEG-----NEKDLEELGSRLV V L F Q N KEDNKDLS F DD L LK	630
<i>Gossypium raimondii</i>		716	RMSKRD-VGSTVD---NLDEEL-SRSHRLS-EALGSSK-LVLFQ S -SNCKELTV D L L K	766
<i>Theobroma cacao</i>		716	RMSRRD-VGDPID---DLDEEL-SRSHRLS-EALGSSK-LVLFQ S -SNCKELTV D L L K	766
<i>Arabidopsis lyrata</i>		701	RISRKD-SDRIN---DVDEET---ISGVPKALG P SK-I V LF H S-CGCKDLS V E L LK	749
<i>Arabidopsis thaliana</i>		701	RISRKD-VDRIN---DVDEET---ISGVS K ALG P SK-I V LF H S-CGCKDLS V E L LK	749
<i>Boechera stricta</i>		701	RISRKD-ADDRIN---DVDEET---ISGVPKALG P SK-I V LF H S-CGCKDLS V E L LK	749
<i>Brassica rapa</i>		674	RLSRKE-GDRVN---DADEE-----V P KAPL S SK-I V LF H S-CGCKDLTVAD L LK	718
<i>Capsella grandiflora</i>		701	RISRKD-ADDRIN---DVDEET---VSGVPKALG P SK-I V LF H S-CGCKDLS V E L LK	749
<i>Capsella rubella</i>		701	RISRKD-ADDRIN---DVDEET---ISGVPKALG P SK-I V LF H S-CGCKDLS V E L LK	749
<i>Eutrema salugineum</i>		682	RLSRKD-ADDRVN---DIDEEM---ISDV P KAP G T S K-I V LF H S-CGCKDLS V E L LK	730
<i>Citrus sinensis</i>		714	KMSRRD-SGCPID---DLDEDM-GR P Q R LS-EALASSK-LVLFQ N -SDCKDLTVSD L LK	764
<i>Citrus clementina</i>		718	KMSRRD-SGCPID---DLDEDM-GR P Q R LS-EALASSK-LVLFQ N -SDCKDLTVSD L LK	768
<i>Cucumis sativus</i>		724	KISRKD-VGDRRNR F DE F DR---ADRLSGALG S SK-LVLFQ N -SECKDLTV A E L LK	775
<i>Glycine max</i>		721	KMSKRD-DDK P MD---NFDEELN R PR R LS-EALASSK-LVLFQ N -SDCKDLTVAD L LK	772
<i>Malus domestica</i>		718	KMSRRG-AKDQID---DFDEEIT-SRPHRIS-GALASSK-LVLFQ N -SDCKD F TVSD L LK	767
<i>Medicago truncatula</i>		717	RMSKRE-EDK P ID---SFDEEMSG R PR R LS S EG F V A SK-LVLFQ N -SDCKDLTVSD L LK	769
<i>Phaseolus vulgaris</i>		717	RTSRRD-DDK P ID---NYDEELN R PH R LS-EALV S SK-LVLFQ N -SDCKDLTVAD L LK	768
<i>Prunus persica</i>		716	KMSRRG-VKDQ N D---DFDDDL-SRPHRLS-GALASSK-LVLFQ N -SDCKELTV D L L K	766

ATP binding region

<i>A. thaliana</i>	PSKR1	730	STNS F DQANIIGCGGF G LVYKA L LPDG K KA V IKKLS G D C G--QIEREF F AE V ET L S R AQH P N L V L LR G F C Y K N-DRLLI S Y M EN G SL D Y W L H ER N D	824
<i>P. patens</i>		870	ATNGFSK T NIIGDGG F GVYKA L PDGR I V A IKK L GH L S--QGNRE F LA E ME T L G K V K H R L V P LL G Y C S F GE-EK L L V Y D Y M K N G S L D L W L R NR A D	964
<i>S. moellendorffii</i>		769	ATNNFDAT N IIGCGGF L VYKA N LPD G N V V A IKR L T S ED G GP Q ME R E F DA E L T SL G NI T HP N L V SL E GY C R L GM R DR L L V Y S Y M EN G SL D Y W L H ER S D	866
<i>A. trichopoda</i>		701	STNNFDQ A NIIGCGGF L VYKA L LPD N T K AA I KR L SG D CG--Q M ER E F R AE V E A L S RAQH K N L V S LR G Y C R H GN-DRLLI S Y M EN G SL D Y W L H ER L D	853
<i>B. distachyon</i>		737	STNNFDE A NIIGCGGF G LVYKA L LPD G T K AA V KR L SG D SG--Q M ER E F H AE V E A L S QAQ H K N L V SL R GY C RY R D-DRLLI Y T M EN N SL D Y W L H ER E D	831
<i>O. sativa</i>		757	STNNFDQ A NIIGCGGF L VYKA L LPD G T K AA V KR L SG D CG--Q M ER E F R AE V E A L S QAQ H K N L V SL R GY C RY G N-DRLLI S Y M EN N SL D Y W L H ER S D	851
<i>P. virgatum</i>		634	STNNFDQ A NIIGCGGF L VYKA L LPD G T K AA V KR L SG D Y G --Q M ER E F R AE V E A L S QAQ H K N L V TL R GY C RY G N-DRLLI S Y M EN G SL D Y W L H ER S D	728
<i>S. italica</i>		743	STNNFDQ A NIIGCGGF L VYKA L LPD G T K AA V KR L SG D CG--Q M ER E F R AE V E A L S QAQ H K N L V TL R GY C RY G N-DRLLI S Y M EN G SL D Y W L H ER S D	837
<i>S. bicolor</i>		751	STNNFDQ A NIIGCGGF L VYKA L LPD G T K AA V KR L SG D CG--Q M ER E F R AE V E A L S QAQ H K N L V TL K GY C RY G N-DRLLI S Y M EN G SL D Y W L H ER S D	845
<i>Z. mays</i>		745	STNNFDQ A NIIGCGGF L VYKA L LPD G T K AA V KR L SG D CG--Q M ER E F R AE V E A L S QAQ H K N L V TL K GY C RY G D-DRLLI S Y M EN G SL D Y W L H ER S D	839
<i>A. coerulea</i>		765	STNNFDQ A NIIGCGGF L VYKA N LP N GS K AA I KR L SG D CG--Q M ER E F R AE V E A L S RAQH K N L V P L Q GY C R H GN-DRLLI S Y M EN G SL D Y W L H ER V D	859
<i>M. guttatus</i>		748	STNNF S Q S NI V CGCG F LVY R AD F PN G AA V KR L SG D CG--Q M ER E F R AE V E A L S RAQH K N L V S L Q GY C I Y R N -DRLLI S Y M EN G SL D Y W L H E Q I E	842
<i>S. lycopersicum</i>		736	STNNF N Q S NI V CGCG F LVY K AE L PN G IK T AI K R L SG D CG--Q M ER E F R AE V E A L S RAQH K N L V S L Q GY C Q H G S -DRLLI S Y M EN G SL D Y W L H ER V D	830
<i>S. tuberosum</i>		763	STNNF N Q S NI V CGCG F LVY K AE L PN G IK T AI K R L SG D CG--Q M ER E F R AE V E A L S RAQH K N L V S L Q GY C Q H G S -DRLLI S Y M EN G SL D Y W L H ER V D	857
<i>V. vinifera</i>		513	STNNF N Q A NIIGCGGF L VYKA N LPD G T R AA I KR L SG D CG--Q M ER E F R AE V E A L S RAQH K N L V S L Q GY C R H GN-DRLLI S Y M EN G SL D Y W L H ER V D	607
<i>E. grandis</i>		766	STSNF S Q A NIIGCGGF L VYKA L LPD G T K AA V KR L SG D CG--Q V ER E F H AE V E A L S RAQH K N L V S L Q GY C R H GN-DRLLI S Y M EN G SL D Y W L H EC N D	860
<i>P. trichocarpa</i>		766	STNNF N Q A NIIGCGGF L VYKA N FP N D T KAA I KR L SG D CG--Q M ER E F R AE V E A L S RAQH K N L V S L Q GY C R H GN-YRLLI S Y M EN G SL D Y W L H ES V D	860
<i>L. usitatissimum</i>		767	ATNNF S Q A NIIGCGGF L VYKA N LP N G K AA I KK L SG D CG--Q I ER E F R AE V E A L S RAQH K N L V S L Q GY C K H G S -DRLLV S Y M EN G SL D Y W L H EC V D	861
<i>M. esculenta</i>		767	STNNF N Q A NIIGCGGF L VYKA N LP N G T KAA I KR L SG D CG--Q M ER E F R AE V E A L S RAQH K N L V S L Q GY C R H GN-DRLLI S Y M EN G SL D Y W L H EC V D	861
<i>R. communis</i>		766	ATNNF N Q A NIIGCGGF L VYKA L LP N GAKAA I KR L SG D CG--Q M ER E F R AE V E A L S RAQH K N L V S L Q GY C R H GN-DRLLI S Y M EN G SL D Y W L H EC A D	860
<i>C. papaya</i>		631	STNNFDQ A NIIGCGGF L VYKA L LPD S R K V A IKR L SG D CG--Q M D R E F R A E V E A L S RAQH P N L V L L Q GY C M H K N -DRLLI S Y M EN G SL D Y W L H E K I D	725
<i>G. raimondii</i>		767	STNNF N Q A NIIGCGGF L VYKA L LPD G T N AA V KR L SG D CG--Q M ER E F R AE V E A L S RAQH K N L V S L Q GY C K H GN-DRLLI S Y M EN G SL D Y W L H ES V D	861
<i>T. cacao</i>		767	STNNF N Q A NIIGCGGF L VYKA L LPD G T K AA V KR L SG D CG--Q M ER E F R AE V E A L S RAQH K N L V S L Q GY C K H GN-DRLLI S Y M EN G SL D Y W L H ES V D	861
<i>A. lyrata</i>		750	STNNF S Q A NIIGCGGF L VYKA N FP D GS K AA V KR L SG D CG--Q M ER E F R AE V E A L S RAEH K N L V S L Q GY C K H GN-DRLLI S Y F M E NG S L D Y W L H ER V D	844
<i>A. thaliana</i>		750	STNNF S Q A NIIGCGGF L VYKA N FP D G T KAA V KR L SG D CG--Q V ER E F H AE V E A L S RAEH K N L V S L Q GY C R H GN-DRLLI S Y M EN G SL D Y W L H ER V D	844
<i>B. stricta</i>		750	STNNF S Q A NIIGCGGF L VYKA N FP D GS K AA V KR L SG D CG--Q M ER E F R AE V E A L S RAEH K N L V S L Q GY C K H GN-DRLLI S Y F M E NG S L D Y W L H ER V D	844
<i>B. rapa</i>		719	STNGF S Q A NIIGCGGF L VYKA N LP D GS K AA V K L SG D CG--Q M ER E F R AE V E A L S RAEH N L V S L Q Y C K H G D-DRLLI S Y F M E NG S L D Y W L H ER V D	813
<i>C. grandiflora</i>		750	STNNF S Q A NIIGCGGF L VYKA N FP D GS K AA V KR L SG D CG--Q M ER E F R AE V E A L S RAEH K N L V S L Q GY C R H GN-DRLLI S Y F M E NG S L D Y W L H ER V D	844
<i>C. rubella</i>		750	STNNF S Q A NIIGCGGF L VYKA N FP D GS K AA V KR L SG D CG--Q M ER E F R AE V E A L S RAEH K N L V S L Q GY C K H GN-DRLLI S Y F M E NG S L D Y W L H ER V D	844
<i>E. salugineum</i>		731	STN F SQ A NIIGCGGF L VYKA N LP D GS K AA V KR L SG D CG--Q M ER E F R AE V E A L S RAEH K N L V S L Q GY C K H GN-DRLLI S Y F M E NG S L D Y W L H ER V D	825
<i>C. sinensis</i>		765	STNNF N Q A NIIGCGGF L VYKA L LT N G T KAA V KR L SG D CG--Q M ER E F R AE V E A L S RAQH K N L V S L Q GY C R H GN-DRLLI S Y M EN G SL D Y W L H ES V D	859
<i>C. clementina</i>		769	STNNF N Q A NIIGCGGF L VYKA L LT N G T KAA V KR L SG D CG--Q M ER E F R AE V E A L S RAQH K N L V S L Q GY C R H GN-DRLLI S Y M EN G SL D Y W L H ES V D	863
<i>C. sativus</i>		776	ATCN F NQ A NIIGCGGF L VYKA L SL P NG K AA V KR L T G D C G--Q M ER E F R AE V E A L S RAQH K N L V S L Q GY C K H GN-DRLLI S Y M EN G SL D Y W L H EV D	870
<i>G. max</i>		773	STNNF N Q A NIIGCGGF L VYKA L LP N GAKAA V KR L SG D CG--Q M ER E F R AE V E A L S RAQH K N L V S L Q GY C R H GN-DRLLI S Y S Y L E N G S L D Y W L H EC V D	867
<i>M. domestica</i>		768	ATSN F NQ A NIIGCGGF L VYKA N LP N GAKAA V KR L SG D CG--Q M ER E F R AE V E A L S RAQH K N L V S L Q GY C R H GN-DRLLI S Y M EN G SL D Y W L H ES V D	862
<i>M. truncatula</i>		770	STSN F NQ A NIIGCGGF L VYKA L LP N G M KAA V KR L SG D CG--Q M ER E F R AE V E A L S RAQH K N L V S L Q GY C R H GN-DRLLI S Y M EN G SL D Y W L H EC V D	864
<i>P. vulgaris</i>		769	STNNF N Q A NIIGCGGF L VYKA L LP N G T KAA I KR L SG D CG--Q M ER E F R AE V E A L S RAQH K N L V S L Q GY C R H GN-DRLLI S Y S Y L E N G S L D Y W L H EC V D	863
<i>P. persica</i>		767	STNNF N Q A NIIGCGGF L VYKA N LP N G T KAA I KR L SG E CG--Q M ER E F R AE V E A L S RAQH K N L V S L Q GY C R H GN-DRLLI S Y M EN G SL D Y W L H ES V D	861

		CaM binding site				Activation segment							
<i>A. thaliana</i>	PSKR1	825	GPALLKWKTRLRIAQGAAGLLYLHGECDPHILHRDIKS	SNILLDENFN	NSHLADFL	GLARLMS	SPYETHV	TSVSTDL	VLVGTLYG	IPPEYQGA	SVATYKGDVY	920	
<i>P. patens</i>		965	ALEHLDPKFRFRIALGSARGLCFLHHGFIPHIHRDIKA	SNILLDANF	EPRVADF	GLARLIS	AYDSHVS	TDIAGT	FGYIPPEY	QGSWR	STTRGDVY	1060	
<i>S. moellendorffii</i>		867	S. moellendorffii	SNILLDGD	LRAHVAD	FLARLML	PSDTHVT	DELVGT	LYGIPPEY	QAQS	SEASLRGDVY	962	
<i>A. trichopoda</i>		854	EGLMLDWGTRLKIAQGSARGLAYLHRVCDPNIHRDVKS	SNILLNDK	FEAHLAD	FGLSRL	LRPYD	THVT	DLVGT	LYGIPPEY	QGLTAT	PKGDVY	949
<i>B. distachyon</i>		832	GGYMLKWD SRLKIAQGSARGLAYLHKVCEPNIHRDVKS	SNILLNEN	FEAHLAD	FGLARLM	QPYD	THVT	DELVGT	LYGIPPEY	SQSLIAT	PKGDVY	927
<i>O. sativa</i>		852	GGYMLKWSERLRIAQGSARGLAYLHKVCEPNIHRDVKS	SNILLNEN	FEAHLAD	FGLARLI	QPYD	THVT	DLVGT	LYGIPPEY	SQSVIAT	PKGDVY	947
<i>P. virgatum</i>		729	GGYMLKWSERLRIAQGSARGLAYLHKVCEPNIHRDVKS	SNILLNEN	FEAHLAD	FGLARLI	QPYD	THVT	DLVGT	LYGIPPEY	SQSVIAT	PKGDVY	824
<i>S. italica</i>		838	GGYMLKWSERLRIAQGSARGLAYLHKVCEPNIHRDVKS	SNILLNEN	FEAHLAD	FGLARLI	QPYD	THVT	DLVGT	LYGIPPEY	SQSVIAT	PKGDVY	933
<i>S. bicolor</i>		846	GGYMLKWSERLRIAQGSARGLAYLHKVCEPNIHRDVKS	SNILLNEN	FEAHLAD	FGLARLI	QPYD	THVT	DLVGT	LYGIPPEY	SQAVIAT	PKGDVY	941
<i>Z. mays</i>		840	GGYVLTWESERLRIAQGSARGLAYLHKVCEPNIHRDVKS	SNILLNEN	FEAHLAD	FGLARLI	QPYD	THVT	DLVGT	LYGIPPEY	SQAVIAT	PKGDVY	935
<i>A. coerulea</i>		860	GGYMLKWDVRLKIAQGAAGGLAYLHKVCEPNIHRDVKS	SNILLNEN	FEAHLAD	FGLARLI	QPYD	THVT	DLVGT	LYGIPPEY	SQAVIAT	PKGDVY	955
<i>M. guttatus</i>		843	DGSFLDWEKRLKIAQGAARGLAYLHN--EPNIHRDIKT	SNILLNEN	FEAHLAD	FGLSRL	LHPYD	THVT	DLVGT	LYGIPPEY	SQSLAAT	FRGDVY	936
<i>S. lycopersicum</i>		831	-GSSLTWDMRLKIAQGAARGLAYLHK--EPNIHRDIKT	SNILLNEN	FEAHLAD	FGLSRL	LRPYD	THVT	DLVGT	LYGIPPEY	SQTLTAT	FRGDVY	923
<i>S. tuberosum</i>		858	-GSSLTWDIRLKIAQGAAGGLAYLHK--EPNIHRDIKT	SNILLNEN	FEAHLAD	FGLSRL	LHPYD	THVT	DLVGT	LYGIPPEY	SQTLTAT	FRGDVY	950
<i>V. vinifera</i>		608	GSSILKWDVRLKIAQGAARGLAYLHKVCEPNIHRDVKS	SNILLNEN	FEAHLAD	FGLSRL	LRPYD	THVT	DLVGT	LYGIPPEY	SQTLTAT	FRGDVY	703
<i>E. grandis</i>		861	GGSVLAWDVRKIAQGAARGLAYLHKVCEPNIHRDVKS	SNILLDEK	FEAHLAD	FGLSRL	LRPYD	THVT	DLVGT	LYGIPPEY	SQTLTAT	FRGDVY	956
<i>P. trichocarpa</i>		861	GTSVLKWEVRLKIAQGAARGLAYLHKVCEPNIHRDVKS	SNILLDEN	FEAHLAD	FGLSRL	LRPYD	THVT	DLVGT	LYGIPPEY	SQTLMAT	CRGDVY	956
<i>L. usitatissimum</i>		862	GPSVLQWEARLKIAGKAAGGLAYLHKICEPNIHRDVKS	SNILLDEK	FEAHLAD	FGLSRL	LRPYD	THVT	DLVGT	LYGIPPEY	SQALTAT	CRGDVY	957
<i>M. esculenta</i>		862	GASFLKWDVRLKVAQGAASGLAYLHKVCEPNIHRDVKS	SNILLDEK	FEAHLAD	FGLSRL	LRPYD	THVT	DLVGT	LYGIPPEY	SQTLTAT	CRGDVY	957
<i>R. communis</i>		861	GASFLKWEVRLKIAQGAASGLAYLHKVCEPNIHRDVKS	SNILLDEK	FEAHLAD	FGLSRL	LRPYD	THVT	DLVGT	LYGIPPEY	SQTLTAT	CRGDVY	918
<i>C. papaya</i>		726	GLSSLDWNTRIQAIGAARGLAYLHQCEPHILHRDIKS	SNILLDEN	FEAHLAD	FGLARLI	LPYD	THVT	DLVGT	LYGIPPEY	QGA	SVATYKGDVY	821
<i>G. raimondii</i>		862	GSSVLKWDVRLKIAQGAARGLAYLHKVCEPNIHRDVKS	SNILLDEK	FEAHLAD	FGLSRL	LRPYD	THVT	DLVGT	LYGIPPEY	SQTLTAT	CRGDVY	957
<i>T. cacao</i>		862	GSSILKWDVRLKIAQGAARGLAYLHKVCEPNIHRDVKS	SNILLDEK	FEAHLAD	FGLSRL	LRPYD	THVT	DLVGT	LYGIPPEY	SQTLTAT	CRGDVY	957
<i>A. lyrata</i>		845	GNMTLKWVRLKIAQGAARGLAYLHKVCEPNIHRDVKS	SNILLDEK	FEAHLAD	FGLARL	LRPYD	THVT	DLVGT	LYGIPPEY	SQSLIAT	CRGDVY	940
<i>A. thaliana</i>		845	GNMTLIWDVRLKIAQGAARGLAYLHKVCEPNIHRDVKS	SNILLDEK	FEAHLAD	FGLARL	LRPYD	THVT	DLVGT	LYGIPPEY	SQSLIAT	CRGDVY	940
<i>B. stricta</i>		845	GNMTLKWVRLKIAQGAARGLAYLHKVCEPNIHRDVKS	SNILLDEK	FEAHLAD	FGLARL	LRPYD	THVT	DLVGT	LYGIPPEY	SQSLIAT	CRGDVY	940
<i>B. rapa</i>		814	GSTTLRWDVRLKIAQGAARGLAYLHKVCEPNIHRDVKS	SNILLDEK	FEAHLAD	FGLARL	LRPYD	THVT	DLVGT	LYGIPPEY	SQALTAT	CRGDVY	909
<i>C. grandiflora</i>		845	GNMTLKWVRLKIAQGAARGLAYLHKVCEPNIHRDVKS	SNILLDEK	FEAHLAD	FGLARL	LRPYD	THVT	DLVGT	LYGIPPEY	SQSLIAT	CRGDVY	940
<i>C. rubella</i>		845	GNMTLKWVRLKIAQGAARGLAYLHKVCEPNIHRDVKS	SNILLDEK	FEAHLAD	FGLARL	LRPYD	THVT	DLVGT	LYGIPPEY	SQSLIAT	CRGDVY	940
<i>E. salsugineum</i>		826	GNMTLKWVRLKIAQGAARGLAYLHKVCEPNIHRDVKS	SNILLDEK	FEAHLAD	FGLARL	LRPYD	THVT	DLVGT	LYGIPPEY	SQSLIAT	CRGDVY	921
<i>C. sinensis</i>		860	KDSVLKWDVRLKIAQGAARGLAYLHKVCEPNIHRDVKS	SNILLDEK	FEAHLAD	FGLSRL	LRPYD	THVT	DLVGT	LYGIPPEY	SQTLTAT	CRGDVY	955
<i>C. clementina</i>		864	KDSVLKWDVRLKIAQGAARGLAYLHKVCEPNIHRDVKS	SNILLDEK	FEAHLAD	FGLSRL	LRPYD	THVT	DLVGT	LYGIPPEY	SQTLTAT	CRGDVY	959
<i>C. sativus</i>		871	NDSILKWETRLKIAQGAARGLAYLHKCEPNIHRDVKS	SNILLDDR	FEAHLAD	FGLSRL	LRPYD	THVT	DLVGT	LYGIPPEY	SQTLTAT	CRGDVY	966
<i>G. max</i>		868	ENSALKWDSRLKVAQGAARGLAYLHKCEPNIHRDVKS	SNILLDDN	FEAHLAD	FGLSRL	LQPYD	THVT	DLVGT	LYGIPPEY	SQTLTAT	FRGDVY	963
<i>M. domestica</i>		863	SFSLKWDVRLKIAQGAARGLAYLHKVCEPNIHRDIKT	SNILLDEK	FEAHLAD	FGLSRL	LRPYD	THVT	DLVGT	LYGIPPEY	SQTLTAT	CRGDVY	958
<i>M. truncatula</i>		865	GNALKWVRLKIAQGAARGLAYLHKCEPNIHRDIKS	SNILLNDK	FEAHLAD	FGLSRL	SPYD	THVT	DLVGT	LYGIPPEY	SQTLTAT	FRGDVY	960
<i>P. vulgaris</i>		864	ESALKWDARLKIAQGAARGLAYLHKCEPNIHRDVKS	SNILLDDK	FEAHLAD	FGLSRL	LQPYD	THVT	DLVGT	LYGIPPEY	SQTLTAT	FRGDVY	959
<i>P. persica</i>		862	GVSLKWDVRLKIAQGAARGLAYLHKCEPNIHRDIKT	SNILLDEK	FEAHLAD	FGLSRL	LRPYD	THVT	DLVGT	LYGIPPEY	SQTLTAT	CRGDVY	957

		GC centre													
<i>A. thaliana</i>	PSKR1	921	SFGVLLLELLTGRKP-VDMCKPKGCRDLISWVVKMKHES	RASEVFDPL	-IYSKEND	---	KEMFRVLE	IACLCL	SENPKQRPT	QQLVSWLDDV	1008				
<i>P. patens</i>		1061	SYGVILLEMLTGKEPTRDDFKDIEGNNLVGWVRQVIRKGD	APKALDSE	VSVKGPWN	---	TMLKVLH	IANLCTA	EDP	IRRP	TMLQVVKFLKDI	1149			
<i>S. moellendorffii</i>		963	SFGVLLVLELTSRRP-VDACRRGGIRDLPVWVEGMQATGR	GIEIVD	PLLQNYSE	VDAL	EMLRVL	DVACIC	VDSC	PQR	RGIEVVAWLDV	1054			
<i>A. trichopoda</i>		950	SFGVLLLELLTGRKP-VDVCKSGKCRDLVSWVQMKREK	KEEIFVFP	---	KQLLQVLE	IACK	ICD	PPRR	RSIE	QVSWLSDV	1037			
<i>B. distachyon</i>		928	SFGVLLLELLTGRKP-VGVLIVK--WDLVSWTLQMQSEN	KEEQIFDKL	-IWSKEHE	---	KQLLAVLE	EAACR	CINAD	PRQRP	PIEQVVAWLDGI	1013			
<i>O. sativa</i>		948	SFGVLLLELLTGRRP-MDVSKAKGSRDLVSVLQMKSEK	KEEQIFD	L-IWSKTHE	---	KQLFSVLE	EAACR	CISTD	PRQRP	SEIQVVAWLDV	1035			
<i>P. virgatum</i>		825	SFGVLLLELLTGRKP-VDVSKSKGSRDLISWVQMKSEK	KEEQIFD	L-IWSKAHE	---	KQLLSVLE	ITCK	CISAD	PRQRP	SEIEVVSCLDKV	912			
<i>S. italica</i>		934	SFGVLLLELLTGRKP-VDVSKSKGSRDLISWVQMKSEK	KEEQIFD	L-IWSKAHE	---	KQLLSVLE	ITCK	CISAD	PRQRP	SEIEVVSCLDNV	1021			
<i>S. bicolor</i>		942	SFGVLLLELLTGRRP-VDVSKFKGSRDLISWVQMKSEK	KEEQIFD	L-IWSKTHE	---	KQLLSVLE	TACK	CISTD	PRQRP	SEIQVVSCLDNV	1029			
<i>Z. mays</i>		936	SFGVLLLELLTGRRP-VDVSRKSGSRDLISWVQMKSEK	KEEQIFD	L-IWSKAHE	---	KQLLSVLE	TACK	CISAD	PRQRP	SEIQVVSCLDNS	1023			
<i>A. coerulea</i>		956	SFGVLLLELLTSRRP-VDVCKAKGTRDLVSWVQLKLEN	KEEQIFD	PS-IWSKSLE	---	KQFIEVL	GVACK	IDQD	PRRR	RSIEQVVLSDSI	1043			
<i>M. guttatus</i>		937	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	REMEIFD	SSVVRD	KECE	---	KQAMEMLE	IACR	CIERD	PRRR	RSIEQVVSLETTI	1025		
<i>S. lycopersicum</i>		924	SFGVLLLELLTGRKP-VEVCRGKNCRDLSVWVQMKSEN	RAEEIFD	TT-IWDT	SYE	---	KQLEVL	SIAC	QCIVQD	PRQRP	SIQVVLWLEAI	1011		
<i>S. tuberosum</i>		951	SFGVLLLELLTGRRP-VEVCRGKNCRDLSVWVQMKSEN	VEEIFD	TS-IWDT	SYE	---	RQLEVL	SIAC	QCIVQD	PRQRP	SIQVVLWLEAI	1038		
<i>V. vinifera</i>		704	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	KEEQIMD	SS-VWDK	DRE	---	KQFLEV	LGIAC	ICDQD	PRQRP	SIQVVSWLDAV	791		
<i>E. grandis</i>		957	SFGVLLLELLTSRRP-VEVCKGKNCRDLSVWVQMKSEK	REEEIID	PS-IWVK	HE	---	RQVLEV	SVAC	NC	TD	DRPRRR	RSIEQVVSWLDRV	1044	
<i>P. trichocarpa</i>		957	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	REAEIID	PA-IW	KDHQ	---	KQFEMLE	IACR	CLDQD	PRRR	PLIEEVVSWLVD	1044		
<i>L. usitatissimum</i>		958	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	REAEIID	TS-IW	KDRE	---	KQLVEM	LEIACR	CLD	HD	PRRR	PLIEEVVSWLSDGI	1045	
<i>M. esculenta</i>		958	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	REAEIID	TS-IW	KDRE	---	KQFEMLE	IACR	CLDQD	PRRR	PLIEEVVSWLSDGI	1045		
<i>R. communis</i>		919	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	REAEIID	TS-IW	KDRE	---	KQLEMLE	IACR	CLDQD	PRRR	PLIEEVVSWLSDGI	1044		
<i>C. papaya</i>		822	SFGVLLLELLTGRKP-MDMCKPKGSRDLISWVQMKSEN	RENEV	FD	PF-IYDK	QHD	---	KEMCLV	LQIAC	ICLSE	CPKVRPT	QQLVSWLDNI	909	
<i>G. raimondii</i>		958	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	REAEIID	TS-IW	KDRE	---	KQLLEMLE	IACR	CLDQD	PRRR	PLIEEVVSWLNSI	1045		
<i>T. cacao</i>		958	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	REAEIID	PS-IW	KDRE	---	KQLEMLE	IACR	CLDQD	PRRR	PLIEEVVSWLNGI	1045		
<i>A. lyrata</i>		941	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	REAEIID	TT-I	REN	VNE	---	KTVLEM	LEIACR	CI	DHEPRRR	PLIEEVVSWLEDL	1028	
<i>A. thaliana</i>		941	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	REAEIID	TT-I	REN	VNE	---	KTVLEM	LEIACR	CI	DHEPRRR	PLIEEVVSWLEDL	1028	
<i>B. stricta</i>		941	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	REAEIID	TT-I	REN	VNE	---	KTVLEM	LEIACR	CI	DHEPRRR	PLIEEVVSWLEDL	1028	
<i>B. rapa</i>		910	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	REAEIID	AT-I	MRE	DVEE	---	KEVLEM	LEIACR	CI	DHEPRRR	PLIEEVVSWLQDF	997	
<i>C. grandiflora</i>		941	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	REAEIID	TT-I	REN	VNE	---	KTVLEM	LEIACR	CI	DHEPRRR	PLIEEVVSWLEDL	1028	
<i>C. rubella</i>		941	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	REAEIID	TT-I	REN	VNE	---	KTVLEM	LEIACR	CI	DHEPRRR	PLIEEVVSWLEDL	1028	
<i>E. salsugineum</i>		922	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	REAEIID	AT-I	HDN	LN	---	KAVLEM	LEIACR	CI	DHEPRRR	PLIEEVVSWLEDF	1009	
<i>C. sinensis</i>		956	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	REVEIID	AS-I	WHK	DRE	---	KQLEMLE	IACR	ICDQD	PRRR	PLIEEVVSWLSDGI	1043	
<i>C. clementina</i>		960	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	REVEIID	AS-I	WHK	DRE	---	KQLEMLE	IACR	ICDQD	PRRR	PLIEEVVSWLSDGI	1047	
<i>C. sativus</i>		967	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEK	REVEIID	PA-I	WN	TSK	---	KQILEV	LGIT	CK	IEQD	PRRR	PLIEEVVSWLDGV	1054
<i>G. max</i>		964	SFGVLLLELLTGRRP-VEVCKGKNCRDLSVWVQMKSEN	KEEQIFD	VP-I	WHK	DHE	---	KQLEVLA	IACR	CLN	QD	PRQRP	SEIIVVSWLSDV	1051

<i>M. domestica</i>	959	SFGVVLELLTGRRP-VEVCRGKNCRDLSWVWFQMRFEKRDEEIIDSS-IWNKNHE---KQLLDVLGVACKCLDPNPRQRPPIEEVVSCLDGI	1046
<i>M. truncatula</i>	961	SFGVVLELLTARRP-VEVIKGNCRNLVSVVYQMKYENKEQEIFDQT-IWEKERE---KQLEVLVSIACKCLDQDPRQRPSEIMVVSWLDSV	1048
<i>P. vulgaris</i>	960	SFGVVLELLTGRRP-VEVIKGNCRNLVFWVFMKSENKEQDIFDPA-IWHKDRE---KQLEMLAIACKCLDQDPRQRPPIEVVVSWLDCV	1047
<i>P. persica</i>	958	SFGVVLELLTGRRP-VEVCRGKNCRDLSWVWFQMKSEKREEEIIDSS-IWNKDHE---KQLEVLGVTKCLDPNPRQRPSEIEVVSCLDGI	1045

<i>A. thaliana</i>	PSKR1	-----	
<i>P. patens</i>	1150	EDQDHV-----	1155
<i>S. moellendorffii</i>	1055	GSSRLKVGGLGKP-----	1066
<i>A. trichopoda</i>	1038	GDAEPVR-----	1044
<i>B. distachyon</i>	1014	SP-----	1015
<i>O. sativa</i>		-----	
<i>P. virgatum</i>		-----	
<i>S. italica</i>		-----	
<i>S. bicolor</i>		-----	
<i>Z. mays</i>	1024	V-----	
<i>A. coerulea</i>	1044	PVDEA-----	1048
<i>M. guttatus</i>	1026	EMEKA-----	1030
<i>S. lycopersicum</i>	1012	ASVKER-----	1017
<i>S. tuberosum</i>	1039	GSVKER-----	1044
<i>V. vinifera</i>	792	GKEGVLPFLFAFEISSFSFFLS-----	813
<i>E. grandis</i>	1045	GIEGSPGS-----	1052
<i>P. trichocarpa</i>	1045	SKVLNNEL-----	1052
<i>L. usitatissimum</i>	1046	GDT-----	1048
<i>M. esculenta</i>	1046	GIQGA-----	1050
<i>R. communis</i>	1045	GIQGAQ-----	1050
<i>C. papaya</i>	910	ETTSSILIM-----	918
<i>G. raimondii</i>	1046	GNEVVRQ-----	1052
<i>T. cacao</i>	1046	EHEVVQQ-----	1052
<i>A. lyrata</i>	1029	PMESVQQQ-----	1036
<i>A. thaliana</i>	1029	PMESVQQQ-----	1036
<i>B. stricta</i>	1029	PMESVQ-----	1034
<i>B. rapa</i>	998	PNQ-----	1000
<i>C. grandiflora</i>	1029	PMESVQQQ-----	1036
<i>C. rubella</i>	1029	PMESVQQQ-----	1036
<i>E. salsugineum</i>	1010	PVESVQQQ-----	1017
<i>C. sinensis</i>	1044	GIDAA-----	1048
<i>C. clementina</i>	1048	GIDAA-----	1052
<i>C. sativus</i>	1055	TSIHTQ-----	1060
<i>G. max</i>	1052	RFDGSQQ-----	1058
<i>M. domestica</i>	1047	GFESGKQ-----	1053
<i>M. truncatula</i>	1049	KVDGFQQ-----	1055
<i>P. vulgaris</i>	1048	RFDGSQQ-----	1054
<i>P. persica</i>	1046	GFESGTQ-----	1052

Supplemental Figure S5. Alignment of PSKR2 orthologs from higher plants and mosses. The intracellular sequences from 37 LRR-RLKs with highest similarity to Arabidopsis PSKR2 were identified from the Phytozome database. The positions of the phosphorylation sites identified in *Arabidopsis thaliana* PSKR1 are indicated. Green denotes sites identified in PSKR1 *in planta* and magenta those identified *in vitro*. Indicated in blue is the T890 that is also transphosphorylated by *E. coli*. Squares indicate unambiguous residues whereas circles indicate phosphorylation sites whose position was not confirmed. Red indicates a conserved residue at the respective position in PSKR2 orthologs and yellow a functionally conserved S/T or Y residue in PSKR2 orthologs.

Supplemental Table 1

Supplemental Table 1. Identification of a single phosphorylation at T890 of H₆-PSKR1-K762E protein by LC-ESI MS.

Peptide Properties

Sequence	Start	End	Phospho-Site Equalling	Search Engine Score [%]	phosphoRS Score [%]	Phospho-Site Position	MH+ [Da]	RT [min]	Precursor Area
HVSTDLVGTL	891	900	no	100,0	50	-	1121,52	63,45	1,40E+006
MSPYETHVST	885	894	yes	100,0	95,9	890	1231,47	42,65	2,19E+005
MSPYETHVSTDLV	885	897	yes	100,0	100	890	1574,64	56,63	1,55E+007
MSPYETHVSTDLVGTL	885	900	yes	100,0	99,4	890	1845,80	67,08	3,97E+007
MSPYETHVSTDLVGTL	885	900	yes	100,0	87,9	890	1829,80	69,51	2,21E+006
RLMSPYETHVST	883	894	yes	100,0	100	890	1516,65	45,45	3,41E+006
RLMSPYETHVST	883	894	yes	100,0	86,3	890	1500,65	50,14	9,14E+005
RLMSPYETHVSTDLV	883	897	yes	100,0	85	890	1843,83	58,46	7,63E+006
RLMSPYETHVSTDLV	883	897	yes	100,0	99,9	890	1827,84	63,04	1,28E+006
RLMSPYETHVSTDLVGTL	883	900	yes	95,7	99,5	890	2114,98	66,42	5,53E+006
RLMSPYETHVSTDLVGTL	883	900	yes	100,0	100	890	2098,99	62,68	3,19E+007

Supplemental Table 2

Supplemental Table 2. Verification of the extent of phosphorylation between H₆-PSKR1-KD and H₆-PSKR1-K762E. A semi-quantitative label-free (precursor area) and spectral counting approach (SPC) was performed.

Peptide Properties													
Origin	Sequence	Start	End	Phospho-Site Equalling	Search Engine Score [%]	phosphoRS Score [%]	Phospho-Site Position	MH+ [Da]	RT [min]	Precursor Area	Ratio Sample vs Control	PSMs	Ratio Sample vs Control
Sample	HVSTDLVGTL	891	900	yes	68,4	59,9	894	1.121,52	61,88	2,52E+007	94,8	19	90,5
Control	HVSTDLVGTL	891	900	no	100,0	50	-	1121,52	63,45	1,40E+006	5,2	2	9,5
Sample	MSPYETHVST	885	894	yes	100,0	76,1	890	1.231,47	40,89	1,74E+007	98,8	25	96,2
Control	MSPYETHVST	885	894	yes	100,0	95,9	890	1231,47	42,65	2,19E+005	1,2	1	3,8
Sample	MSPYETHVSTDLV	885	897	yes	88,6	84,1	890	1.574,64	55,56	2,16E+008	93,3	44	84,6
Control	MSPYETHVSTDLV	885	897	yes	100,0	100	890	1574,64	56,63	1,55E+007	6,7	8	15,4
Sample	MSPYETHVSTDLVGTL	885	900	yes	96,5	86,9	890	1.845,80	67,1	2,64E+008	86,9	115	87,1
Control	MSPYETHVSTDLVGTL	885	900	yes	100,0	99,4	890	1845,80	67,08	3,97E+007	13,1	17	12,9
Sample	MSPYETHVSTDLVGTL	885	900	yes	100,0	98,9	890	1.829,80	66,17	2,01E+008	98,9	34	87,2
Control	MSPYETHVSTDLVGTL	885	900	yes	100,0	87,9	890	1829,80	69,51	2,21E+006	1,1	5	12,8
Sample	RLMSPYETHVST	883	894	yes	100,0	92,7	890	1.516,65	44,02	5,81E+007	94,5	42	93,3
Control	RLMSPYETHVST	883	894	yes	100,0	100	890	1516,65	45,45	3,41E+006	5,5	3	6,7
Sample	RLMSPYETHVST	883	894	yes	100,0	90	890	1.500,65	45,76	1,48E+007	94,2	35	89,7
Control	RLMSPYETHVST	883	894	yes	100,0	86,3	890	1500,65	50,14	9,14E+005	5,8	4	10,3
Sample	RLMSPYETHVSTDLV	883	897	yes	88,5	82,1	890	1.843,83	55,7	8,56E+007	91,8	87	89,7
Control	RLMSPYETHVSTDLV	883	897	yes	100,0	85	890	1843,83	58,46	7,63E+006	8,2	10	10,3
Sample	RLMSPYETHVSTDLV	883	897	yes	97,1	99	890	1.827,83	58,63	8,32E+007	98,5	70	92,1
Control	RLMSPYETHVSTDLV	883	897	yes	100,0	99,9	890	1827,84	63,04	1,28E+006	1,5	6	7,9
Sample	RLMSPYETHVSTDLVGTL	883	900	yes	74,7	83,3	890	2.114,98	63,6	1,33E+008	96,0	174	88,3
Control	RLMSPYETHVSTDLVGTL	883	900	yes	95,7	99,5	890	2114,98	66,42	5,53E+006	4,0	23	11,7
Sample	RLMSPYETHVSTDLVGTL	883	900	yes	95,4	94,5	890	2.098,99	64,98	2,40E+008	88,3	87	97,8
Control	RLMSPYETHVSTDLVGTL	883	900	yes	100,0	100	890	2098,99	62,68	3,19E+007	11,7	2	2,2

Supplemental Table 3

Supplemental Table 3. Identification of two to three *in planta* phosphorylation sites (S698, S696/S698 and S886 or S893) of immunoprecipitated PSKR1-GFP by LC-ESI MS.

Peptide Properties

Sequence	Start	End	Phospho-Site Equalling	Search Engine Score [%]	phosphoRS Score [%]	Phospho-Site Position	MH+ [Da]	RT [min]	Precursor Area
RSGEVDPEIEESES MNRK	685	702	yes	100,0	99,4	698	2171,92	27,01	7,94E+006
RSGEVDPEIEESES MNRK	685	702	yes	100,0	97,7	698	2187,92	23,57	7,71E+006
SGEVDPEIEESES MNRK	686	702	yes	95,2	89,8	698	2015,82	30,13	1,55E+008
SGEVDPEIEESES MNRK	686	702	yes	73,9	81,1	698	2031,82	26,36	1,34E+008
SGEVDPEIEESES MNRKELGEIGSK	686	710	yes	81,8	99,8	698	2829,24	41,59	1,89E+008
SGEVDPEIEESES MNRKELGEIGSK	686	710	yes	82,4	85,2	698	2845,24	38,73	2,06E+008
SGEVDPEIEESES MNRKELGEIGSK	686	710	yes	100,0	100	696&698	2925,20	38,63	4,40E+007
RLMSPYETHVSTDLVGTL	883	900	yes	100,0	74,7	893	2098,99	53,63	5,06E+006
RLMSPYETHVSTDLVGTL	883	900	yes	100,0	99,4	886	2114,98	49,76	8,96E+006
LMSPYETHVSTDLVGTLGYIPPEYQQASVATYK	884	916	yes	25,0	49,4	886	3683,72	58,87	3,29E+006

Supplemental Table 4

Supplemental Table 4. Accession numbers of the AtPSKR1 orthologs identified from the Phytozome database and the respective protein accessions in NCBI. The asterisk indicates $\geq 97\%$ identity to the Phytozome sequence.

Organism	Accession Phytozome v10	Accession NCBI
<i>Physcomitrella patens</i>	Phpat.001G165500.2	-
<i>Selaginella moellendorffii</i>	121260	-
<i>Amborella trichopoda</i>	evm_27.model.AmTr_v1.0_scaffold00029.177	XP_006847965*
<i>Brachypodium distachyon</i>	Bradi3g49370.1	XP_003575411
<i>Oryza sativa</i>	LOC_Os02g41890.1	-
<i>Panicum virgatum</i>	Pavir.Ga00206.1	-
<i>Setaria italica</i>	Si016177m	XP_004953174*
<i>Sorghum bicolor</i>	Sobic.004G222100.1	XP_002454207*
<i>Zea mays</i>	GRMZM2G080537_T01	AFW72422
<i>Aquilegia coerulea</i>	Aquca_002_01421.1	-
<i>Mimulus guttatus</i>	Migut.E00603.1	EYU30259*
<i>Solanum lycopersicum</i>	Solyc01g008140.2.1	XP_004228537*
<i>Solanum tuberosum</i>	PGSC0003DMT400042178	XP_006348541*
<i>Vitis vinifera</i>	GSVIVT01014303001	CBI20272
<i>Eucalyptus grandis</i>	Eucgr.J01778.1	KCW52373
<i>Populus trichocarpa</i>	Potri.008G144700.1	XP_002312507*
<i>Linum usitatissimum</i>	Lus10005403	-
<i>Manihot esculenta</i>	cassava4.1_027914m	-
<i>Ricinus communis</i>	29801.m003229	XP_002518809*
<i>Carica papaya</i>	evm.model.supercontig_2.62	-
<i>Gossypium raimondii</i>	Gorai.005G151100.1	-
<i>Theobroma cacao</i>	Thecc1EG011306t1	XP_007045577
<i>Arabidopsis lyrata</i>	484148	XP_002876804
<i>Arabidopsis thaliana</i>	AT2G02220.1	Q9ZVR7
<i>Boechera stricta</i>	Bostr.0556s0048.1	-
<i>Brassica rapa</i>	Brara.F03427.1	-
<i>Capsella grandiflora</i>	Cagra.2767s0007.1	-
<i>Capsella rubella</i>	Carubv10019052m	XP_006292801
<i>Eutrema salsugineum</i>	Thhalv10003581m	XP_006395801
<i>Citrus sinensis</i>	orange1.1g035998m	XP_006470905*
<i>Citrus clementina</i>	Ciclev10004232m	XP_006420664
<i>Cucumis sativus</i>	Cucsa.229250.2	XP_004140449
<i>Glycine max</i>	Glyma.13G275100.1	-
<i>Malus domestica</i>	MDP0000142599	XP_008340497
<i>Medicago truncatula</i>	Medtr2g078810.1	KEH38700
<i>Phaseolus vulgaris</i>	Phvul.005G073800.1	XP_007149480*
<i>Prunus persica</i>	ppa000729m	XP_007227028

Supplemental Table 5

Supplemental Table 54. Accession numbers of the AtPSKR2 orthologs identified from the Phytozome database and the respective protein accessions in NCBI. The asterisk indicates $\geq 97\%$ identity to the Phytozome sequence.

Organism	Accession Phytozome v10	Accession NCBI
<i>Physcomitrella patens</i>	Phpat.014G063600.1	-
<i>Selaginella moellendorffii</i>	121260	-
<i>Amborella trichopoda</i>	evm_27.model.AmTr_v1.0_scaffold00160.2	XP_006849388
<i>Brachypodium distachyon</i>	Bradi1g59360.1	XP_003561510*
<i>Oryza sativa</i>	LOC_Os04g57630.1	-
<i>Panicum virgatum</i>	Pavir.Bb00088.1	-
<i>Setaria italica</i>	Si031967m	XP_004955312*
<i>Sorghum bicolor</i>	Sobic.002G006100.1	XP_002459218*
<i>Zea mays</i>	GRMZM2G120574_T01	XP_008651929*
<i>Aquilegia coerulea</i>	Aquca_036_00102.1	-
<i>Mimulus guttatus</i>	Migut.H01950.4	EYU26371*
<i>Solanum lycopersicum</i>	Solyc07g063000.2.1	XP_004244239*
<i>Solanum tuberosum</i>	PGSC0003DMT400032398	XP_006348262*
<i>Vitis vinifera</i>	GSVIVT01014303001	-
<i>Eucalyptus grandis</i>	Eucgr.F01155.2	KCW67382*
<i>Populus trichocarpa</i>	Potri.011G116900.1	XP_002317487
<i>Linum usitatissimum</i>	Lus10009213	-
<i>Manihot esculenta</i>	cassava4.1_000747m	-
<i>Ricinus communis</i>	29668.m000312	XP_002528241*
<i>Carica papaya</i>	evm.model.supercontig_2.62	-
<i>Gossypium raimondii</i>	Gorai.002G068500.2	-
<i>Theobroma cacao</i>	Thecc1EG031592t1	XP_007021540*
<i>Arabidopsis lyrata</i>	495467	XP_002864288
<i>Arabidopsis thaliana</i>	AT5G53890.1	Q9FN37
<i>Boechera stricta</i>	Bostr.26833s0888.1	-
<i>Brassica rapa</i>	Brara.J00880.1	XP_009119929*
<i>Capsella grandiflora</i>	Cagra.2460s0051.1	-
<i>Capsella rubella</i>	Carubv10025797m	XP_006279563
<i>Eutrema salsugineum</i>	Thhalv10012554m	XP_006401649
<i>Citrus sinensis</i>	orange1.1g001591m	XP_006464783*
<i>Citrus clementina</i>	Ciclev10007314m	XP_006451809
<i>Cucumis sativus</i>	Cucsa.032510.1	XP_004146245*
<i>Glycine max</i>	Glyma.13G275100.1	XP_006594757*
<i>Malus domestica</i>	MDP0000950533	XP_008349995*
<i>Medicago truncatula</i>	Medtr2g078810.1	-
<i>Phaseolus vulgaris</i>	Phvul.005G073800.1	-
<i>Prunus persica</i>	ppa000652m	XP_007213710