

**File S1 Alignment of CpAQPs with structure determined SoPIP2;1, AtTIP2;1, and OsNIP2;1.** Multiple sequence alignment was performed using MUSCLE. Transmembrane helices (TM1–TM6) and the two short helices forming the two NPAs (HB and HE) (**shaded**), NPA motifs (shown in **red**), and ar/R selectivity filter residues (shown in **green**) are indicated. The highly conserved cysteine residues in XIPs are shown in **bold**. The residues at the position corresponding to S<sup>115</sup> and S<sup>274</sup> in SoPIP2;1 (PDB accession number 1Z98) are highlighted in **bright green**, whereas the residues at the position corresponding to L<sup>197</sup> from SoPIP2;1, determined to be the key residue involved in gating (occurring just before TM5) are underlined. The residues at the position corresponding to H<sup>131</sup> in AtTIP2;1 (PDB accession number 5I32) are shown in **yellow**. The residues at the position corresponding to T<sup>109</sup> in OsNIP2;1 (PDB accession number 7CJS) are shown in **pink**. The residues at the position corresponding to S<sup>262</sup> in GmNOD26 (Genbank accession number P08995) are shown in **dark green**. “\*”, “:”, and “.” indicate consensus, strongly similar, and weakly similar amino acids, respectively.

SoPIP2;1	-----MS--KEVSEEAQAHQH GKDYVDPPPAPFFDLGELKL-----
AtTIP2;1	-----MAGVAFGS-FDDSF-----
OsNIP2;1	-----MASNNSRTNSRANYSNEI HDLSTVQNGTMPTMYGKAIAD-----
CpPIP1;1	MEGKEEDVKLGANKF SERQPIGTAAQTD---KDYKEPPPAPLFEPGELKS-----
CpPIP1;2	MEGKEEDVKLGANKF SERQPIGTSAQTD---KDYKEPPPAPLFEPGELHS-----
CpPIP1;3	MEGKEEDVRLGANKY SERQPIGTAAQSQDGGKDYKEPPPAPLFEPGELTS-----
CpPIP1;4	MEGKEEDVRLGANRYRERQPIGTAAQTQD-AKDYTEPPPAPLIEPGELFS-----
CpPIP2;1	-----MA--KDIE--VGGEFQAKDYHDPPPAPLIDPEELTK-----
CpPIP2;2	-----MT--KDVEVAEQGEFS AKDYHDPPPAPLIDVEELTK-----
CpPIP2;3	-----MT--KDAG--EHGSFS AKDYHDPPPAPLIDFAVELTK-----
CpPIP2;4	-----MS--KEVSEEGQS--HGKDYVDPPPAPLIDLAEIKL-----
CpPIP2;5	-----MSGGEGNEQTVGAEIRGRDYEDPPPASLIDMEELKK-----
CpTIP1;1	-----MPIRNIAIGR-PEEATH-----
CpTIP1;2	-----MPISQIAIGS-PAEIR-----
CpTIP1;3	-----MPIYRVAIGA-PRELSH-----
CpTIP2;1	-----MACIAFGR-FDDIYS-----
CpTIP6;1	-----MVKIALGS-FGDSFS-----
CpTIP3;1	-----MPVRRYAFGR-VEEVTH-----
CpTIP4;1	-----MAKIALGT-RHEVTK-----
CpTIP5;1	-----MAPASLTSRFGQSIT-----
CpNIP1;1	-----MAEISMNSANNRVLNVNDGDVGHNSLPASTSESLEKRDSAL-----
CpNIP2;1	-----MAG--TLTHPNLNNQTDINDLVSVES-PISDRSSIWKSFEH-----
CpNIP4;1	-----MASKNDSIEEVPPDVEEEGTATSTNRLEPTSKNSSN-----
CpNIP8;1	-----MSHQDYEVSKVEEGEA-----CSRSSSRIPESST-----
CpNIP5;1	-----MPESETGTPTASAPATPGTPGGPLISGLRVDLSL---YDRKSMAR-CKCLPVTAP-----
CpNIP6;1	-----MDQKEDVPSAPSTPATPGTPGAPLFGGFRFRERSSSGFFRSKSLINTCNCFTLRDW-----
CpNIP7;1	-----MKIKNFLNPQSSPDDQNTNGFINTTIFPLHCLSLQM-----
CpXIP1;1	-----MESVIVSSDRSTHSAL-----STSIENYDKTSPTRISKNSFLASIG-----
CpXIP2;1	-MARNGGAIVVEDEENPYSATRIQPVASTPMAQQRNTEKGKKKTPTTLTGVLG-----
CpSIP1;1	-----
CpSIP3;1	-----
CpSIP2;1	-----

# TMI

SoPIP2;1	-----WSFWRAAIAEFIAITLLFLYITVATVIGHSKETV-----V
AtTIP2;1	-----LASLRAYLAEFISTLLFVFAGVGSIAIAYAKLTSDA-----A
OsNIP2;1	-----FFPPHLLKKVVSEVVATFLLVFMTCGAAGISGSDLS-----
CpPIP1;1	-----WSFYRAGIAEFIAITFLFLYITILTVMGVKRSDS-----M
CpPIP1;2	-----WSFWRAGIAEFMATFLFLYITVLTVMGVNRPAN-----K
CpPIP1;3	-----WSFYRAGIAEFMATFLFLYITVLTVMGVVKESS-----K
CpPIP1;4	-----WSFYRAGIAEFVATFLFLYITVLTVMGVVKSPT-----K
CpPIP2;1	-----WSFYRALTAEFVATLLFLYITVLTVIGYKSQTD-KNQGGDD
CpPIP2;2	-----WSFYRALIAEFVATLLFLYVTVLTVIGHKSQTDLTKAGTDV
CpPIP2;3	-----WSFYRALIAEFIAITLLFLYVTVLTVIGHKSQH-----AADQ
CpPIP2;4	-----WSFYRALIAEFIAITLLFLYVTIATVIGHKKQAG-----P
CpPIP2;5	-----WSFYRAVIAEFVATFLFLYVGIATVIGNKKQIH-----P
CpTIP1;1	-----PDALKAALAEFISMLIFVFAGEGSGMAFNKLTNNG-----A
CpTIP1;2	-----PDALKAALAEFISMLIFVFAGEGSGMAFNKLTNYG-----S
CpTIP1;3	-----PSAIRAALAEFFSMVIFVFAGEGSGMAFDKLTNNG-----S
CpTIP2;1	-----LASLKAYLAEFISTLLFVFAGVGSAMAFNKLTSDA-----P
CpTIP6;1	-----VGSLKAYLSEFIATLLFVFAGVGSIAIAFGKVTSDG-----A
CpTIP3;1	-----PDSIRATLAEFLSTLVFVFAGEGSVLALDKLYRETG-GDVS
CpTIP4;1	-----PDCIRALVVEFITTTFLFVFTGVGSAMAADRLVGNG-----
CpTIP5;1	-----KNAFRSYLAEFISTFFYVLTVVGSSMSARKLMGSG-----A
CpNIP1;1	-----SFSVPFIQKLMAEFFGTFFLIFAGCASVAVNDEYEK-----
CpNIP2;1	-----HYPPCFLRKVAAEVIATYLLVFVTCGSAAISAIDES-----
CpNIP4;1	-----LWAFTLAQKVIAELVGTYFIIIFSGCGAVAVNKIYG-----
CpNIP8;1	-----SWVVELLQKVIAEVLGTYFVMFSGCGSVVVNKIYG-----
CpNIP5;1	TWGQP--HTCFIDFPAPDVSLTRKLGAEFVGTFILIFAATAAPIVNQKYNG-----
CpNIP6;1	SLEDPSVLPPVTCTLPHPVSLARKVGAFIGTLILIFAGTATAIVNQKSQG-----
CpNIP7;1	-----DFNPARAILAEMVGTFILVLCVCGIIASQQLMRG-----
CpXIP1;1	-----AHEFFSQEMWGAAITELVGTTCLLFTLTISIVACLNFE-----
CpXIP2;1	-----FKDLFSLKVWRASLAELLGTAVLVFAMDTIVISSYETQT-----
CpSIP1;1	-----MGPIKAAIGDMILTFMWNFFASTFGLMT--VMILGAAGLQG
CpSIP3;1	-----MGVIRSAIGDSVLTSMWVFNLPVIGLLAGRASDFLRTHYIS
CpSIP2;1	-----MAKIRLLISDFIVSFMWVWSGVLIKIFVHRVLGLGHEPRAE

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## TM2

SoPIP2;1	CGSVGLLGIAWAFGGMIFVLVYCTAGISGGHINPAVTFGLFLARKVSLLRALVYMIAQCL
AtTIP2;1	LDTPGLVAIAVCHGFALFVAVAIGANISGGHVNPAVTFGLAVGGQITVITGVFYWIAQLL
OsNIP2;1	--RISQLGQSIAGGLIVTVMYIYAVGHISGAHMNPAVTLAFAVFRHFPWIQVPFYWAAQFT
CpPIP1;1	CASVGIQGIWAFFGGMIFALVYCTAGISGGHINPAVTFGLLLARKLSLTRAIFYMIMQCL
CpPIP1;2	CASVGIQGIWAFFGGMIFALVYCTAGISGGHINPAVTFGLFLARKLSLTRSIFYMVMQCL
CpPIP1;3	CSTVGIQGIWAFFGGMIFALVYCTAGISGGHINPAVTFGLLLARKLSLTRAIFYMVMQCL
CpPIP1;4	CSTVGIQGIWAFFGGMIFALVYCTAGISGGHINPAVTFGLLLARKLSLVRIFYMIMQCL
CpPIP2;1	RGGVGILGIAWAFGGMIFILVYCTAGISGGHINPAVTFGLFLARKVSLVRIFYMVAQCL
CpPIP2;2	CGGVGLLGIAWAFGGMIFILVYCTAGISGGHINPAVTLGLFLARKVSLIRAIMYMVAQCL
CpPIP2;3	CGGVGILGIAWAFGGMIFILVYCTAGISGGHINPAVTFGLFLARKVSLVRIFYMVAQCL
CpPIP2;4	CDGVGILGIAWAFGGMIFILVYCTAGISGGHINPAVTFGLFLARKVSLIRAVAYMVAQCL
CpPIP2;5	CDGVGLLGISWSFGGMIFILVYCTAGISGGHINPAVTLGLFAARKMSLIRAAAYMVSQCG
CpTIP1;1	ATPAGLIAAAIAHAFALFVAVAVGANISGGHVNPAVTFGAFVGGNISLLRGILYWIAQLL
CpTIP1;2	ATPAGLISASLAHAFALFVAVSVGANISGGHVNPAVTFGAFVGGHISLFRSVLYWIAQCL
CpTIP1;3	STPAGLVAAASLAHAFALFVAVSVGANISGGHVNPAVTFGAFVGGNITFFRSILYWIAQLL
CpTIP2;1	LDPSGLVAIAVCHGFALFVAVAVAANISGGHVNPAVTLGLAVGGQITILTGFIFYWIAQLL
CpTIP6;1	LDPAGLVAAIAVAHAFALFVGVAIAANISGGHLNPAVTLGLAIGGNITLLTGLFYWIAQCL
CpTIP3;1	RDPSGLVLIALAHALSLSFSAVSASINISGGHVNPAVTFGALLGGRISVLRIFYWLAQCL
CpTIP4;1	--LLGLFAVAVAHALVVAVMISAG-HISGGHLNPAVTLGLLFGGHITLVRISILYWIDQCL
CpTIP5;1	EDPSGLVIVAIAANSLGLSYTVYVASNISGGHVNPAVTFARAVGGHVSPTALFYWVSQML
CpNIP1;1	--VVTLPGISIVWGLAVMVLVYSVGHISGAHFNPAVTIAFASCRRFPLKQVPAYILVQCL
CpNIP2;1	--RVSKLAASVAGGLIVTVMYIYAVGHISGAHMNPAVTLAFAALRHFPWKQVPFYAAAQVT
CpNIP4;1	--SVTFPGICVTWGLIVTVMYITVGHVSGAHFNPAVTIAFTIFQKFPSEVLIFYIVAQFL
CpNIP8;1	--SVTFPGICVWGLIVMVMVYSVGHISGAHFNPAVTITFAIFRRFPFKQVPLYILAQCL
CpNIP5;1	--AETLIGNAACSGLAVMIIILSTGHISGAHLNPSVTICFAALRHFPWAQVPAYIAAQIS
CpNIP6;1	--SETLIGLAASTGLAVMIVILSTGHISGAHLNPAVTISFAALHHFPWKHVPAYIAAQTV
CpNIP7;1	--EVGLMEYAATAGLTVVVVIFCIGPISGAHVNPAVTIAFAIFGHFSWSRVPFYILAQML
CpXIP1;1	--VESKLLVPIVVFVILFFFLMATIPISGGHMNPVFTFIATLKGIIITITRAAFYFLAQCL
CpXIP2;1	--KTPHLIMSFLVAITVTILLLATSPIISGGHINPIVTVAAVLTGLISVSRAIVYILAQCI
CpSIP1;1	VAWAPVLITILLVFIFVFIFGLIGDALGGASFNPTGTAAFYAAGVG--SDSLLSMAIRFP
CpSIP3;1	LPFTGLFITILLATINVLFLTLLGTLGGASFNPTTTSFHAAGLTKPGSSSLISMAVRLP
CpSIP2;1	IIRG-----AMAIIVNMFFFAFLGKVGKGASYNPLTVLAPAVSGDF--SSFLFSLGCRIP

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		HB	TM3
SoPIP2;1	CGSVGLLGIAWAFGGMIFVLVYCTAGISGGHIN	PAVTFGLFLARKV	SLLRALVYMIAQCL
AtTIP2;1	LDTPGLVAIAVCHGFALFVAVAIGANISGGHVN	PAVTFGLAVGGQI	TVITGVFYWIAQLL
OsNIP2;1	--RISQLGQSIAGGLIVTVMIIYAVGHISGAHMN	PAVTLAFAVFRHFP	WIQVPFYWAAQFT
CpPIP1;1	CASVGIQGIAWAFGGMIFALVYCTAGISGGHIN	PAVTFGLLLARKL	SLTRAVFYMIMQCL
CpPIP1;2	CASVGIQGIAWAFGGMIFALVYCTAGISGGHIN	PAVTFGLFLARKL	SLTRSFYVMVMQCL
CpPIP1;3	CSTVGIQGIAWAFGGMIFALVYCTAGISGGHIN	PAVTFGLLLARKL	SLTRAIFYMVMQCL
CpPIP1;4	CSTVGIQGIAWAFGGMIFALVYCTAGISGGHIN	PAVTFGLLLARKL	SLVRAV FYMIMQCL
CpPIP2;1	RGGVGILGIAWAFGGMIFILVYCTAGISGGHIN	PAVTFGLFLARKV	SLVRAVLYMVAQCL
CpPIP2;2	CGGVGILGIAWAFGGMIFILVYCTAGISGGHIN	PAVTFGLFLARKV	SLIRAIMY MVAQCL
CpPIP2;3	CGGVGILGIAWAFGGMIFILVYCTAGISGGHIN	PAVTFGLFLARKV	SLVRAVMYMVAQCL
CpPIP2;4	CDGVGILGIAWAFGGMIFILVYCTAGISGGHIN	PAVTFGLFLARKV	SLIRAVAYMVAQCL
CpPIP2;5	CDGVGLLGISWSFGGMIFILVYCTAGISGGHIN	PAVTLGLFAARKM	SLIRAAAYMVSQCG
CpTIP1;1	ATPAGLIAAAIAHAFALFVAVAVGANISGGHVN	PAVTFGAFVGGNI	SLLRGILYWIAQLL
CpTIP1;2	ATPAGLISASLAHAFALFVAVSVGANISGGHVN	PAVTFGAFVGGHI	SLFRSVLYWIAQCL
CpTIP1;3	STPAGLVAASLAHAFALFVAVSVGANISGGHVN	PAVTFGAFVGGNI	TFFRSILYWIAQLL
CpTIP2;1	LDPSGLVAIAVCHGFALFVAVAVAANISGGHVN	PAVTLGLAVGGQI	TILTGFIFYWIAQLL
CpTIP6;1	LDPAGLVAIAVAHAFALFVGVAIAANISGGHLN	PAVTLGLAIGGNI	TLLTGLFYWIAQCL
CpTIP3;1	RDPSGLVLIALAHALSLSAVSASINISGGHVN	PAVTFGALLGGRI	SVLRAFYYWLAQLL
CpTIP4;1	--LLGLFAVAVAHALVVAVMISAG-HISGGHLN	PAVTLGLLFGGHI	TLVRSILYWIDQLL
CpTIP5;1	EDPSGLVIVAIANSLSYTVYVASNISGGHVN	PAVTFARAVGGHV	SVPTALFYWVSQML
CpNIP1;1	--VVTLPGISIVWGLAVMVLVYSVGHISGAHFN	PAVTIAFASCRRF	PLKQVPAYILVQLL
CpNIP2;1	--RVSKLAASVAGGLIVTVMIIYAVGHISGAHMN	PAVTLAFAALRHFP	PKQVPFYAAAQVT
CpNIP4;1	--SVTFPGICVTWGLIVTVMIIYTVGHVSGAHFN	PAVTIAFTIFQKFP	PSEVLFIYIVAQFL
CpNIP8;1	--SVTFPGICVWGLIVMVMVYSVGHISGAHFN	PAVTITFAIFRRFP	PKQVPLYILAQLL
CpNIP5;1	--AETLIGNAACSGLAVMIIILSTGHISGAHLN	PSVTICFAALRHFP	WAQVPAYIAAQIS
CpNIP6;1	--SETLIGLAASTGLAVMIVILSTGHISGAHLN	PAVTISFAALHHFP	WKHVPAYIAAQTV
CpNIP7;1	--EVGLMEYAATAGLTVVVVIFCIGPISGAHVN	PAVTIAFAIFGHF	SWSRVPFYILAQML
CpXIP1;1	--VESKLLVPIVVVFVILFFFLMATIPISGGHMN	PVFTFIATLKGII	TITRAAFYFLAQCL
CpXIP2;1	--KTPHLIMSFLVAITVTILLLATSPISGGHIN	PIVTVAAVLTGLI	SVSRAIVYILAQCI
CpSIP1;1	VAWAPVLITTLLVFIFVFIFGLIGDALGGASFNP	TGTAIFYAAGVG	--SDSLLSMAIRFP
CpSIP3;1	LPFTGLFITILLATINVLLFTLLGTLGASFN	PSTTVSFHAAGLTK	PGSSSLISMAVRLP
CpSIP2;1	IIRG-----AMAIVNMFFFAFLGKVGKGASYN	PLTVLAPAVSGDF	--SSFLFSLGCRIP
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# TM4

SoPIP2;1	GAICGVGLVKAFM-KGPYNQFGGG-----ANSVALGYNKGTALGAEIIGTFVLV
AtTIP2;1	GSTAACFLLKYVTGGLAVPTHS-----VAAGLGSIEGVVMEIITFALV
OsNIP2;1	GAICASFVLKAVIHP-VDVIGT-----TTPVGPHW--HSLVVEVIVTFNMM
CpPIP1;1	GAICGAGVVKGFQ-PGPYQRLGGG-----ANVVNHGYTKGDGLGAEIVGTFVLV
CpPIP1;2	GAICGAGVVKGFQ-PRPYQMLGGG-----ANMVNHGYTKGDGLGAEIVGTFVLV
CpPIP1;3	GAICGAGVVKGFEGSATFELKGGG-----ANVVNHGYTKGDGLGAEIVGTFVLV
CpPIP1;4	GAICGAGVVKAFF-KTQYEMLGGG-----ANTVGPAYSKTAGLGAEIVGTFVLV
CpPIP2;1	GAICGCVGLVKAFQ-KACYNRYGGG-----ANQLALGYSTGTGLGAEIIGTFVLV
CpPIP2;2	GAICGCVGLVKAFQ-SSFYNYRGGG-----ANSLNGGYNKGTGLGAEIIGTFVLV
CpPIP2;3	GAICGCVGLVKAFQ-KSFYNYRFGG-----ANTLADGYNVGTGLGAEIIGTFVLV
CpPIP2;4	GAICGCVGLVKAFM-KNYYNRLGGG-----ANTVATGYNTGTALGAEIIGTFVLV
CpPIP2;5	GAICGCVGLVKLFM-TRSYNMHGGG-----ANSVAPGFSTTTGLGAEIIGSFVLV
CpTIP1;1	GSVAACALLKFATGGLTTSFAFA-----LSSGVGVWNAFVFEIVMTFGLV
CpTIP1;2	GSVLACLLLKFSTGGLETSAFA-----LSSGVGELNALVFEIVMTFGLV
CpTIP1;3	GSVVACLLLKFATGNMETAFAFG-----LSSGVSPMNALVFEIVMTFGLV
CpTIP2;1	GSIVACFLLKAVTGCAIPIHS-----VAAEVGVIGGLVMEIITFALV
CpTIP6;1	GSIVACGLLKFTV-DLSVPTHS-----VGSVGSVLEGVVMEIVITFALV
CpTIP3;1	GAIVACLLLRLVTAGMRPVGFR-----VASGVGELNGLVLEMLVLTFGML
CpTIP4;1	ASSIACILLKYLTGGLDTPIHT-----LASGVGYGQGVVWEIVLTFSL
CpTIP5;1	ASVMASLILRVMTVAQHVPTYA-----IAEQMTGFGASVLEGVLTFAV
CpNIP1;1	GSTLAAGTLRLLFNGQHVFVTG-----TAPSGSDM--QSFGEIETITFYLM
CpNIP2;1	GAISAAFTLRVLLHP-IKLIGT-----TSPAGSDI--QALIMEIVVTFSM
CpNIP4;1	GSILASGTLALMFDITPNAYFG-----TTPVGSNG--QSLAIEIITFLLT
CpNIP8;1	GAILASYTLWIIHFVNESFFG-----TVPVGSDL--QSLWIEIISFILM
CpNIP5;1	ASICASFTLKGVFHP-FLSGGV-----TVPSVSLG--QAFLEFLISFILL
CpNIP6;1	GSLCAAFALKIVFHP-MMGGGV-----TVPSVSVGYAQAFLEFIISFNLM
CpNIP7;1	GSTLATWAGRSVYGVRADLMAT-----RPVQGCFA---AFWVEFFGTFIIM
CpXIP1;1	GSIIISFIIKSVMNHSATKFSLGGCSIKGHGS-----TGLHLGVALMLEFSCTFLVL
CpXIP2;1	GGILGALALKAVVNSTIQQTFSLGGCTLTVVVPGRHGPVIGLETGQALWLEICTFVFL
CpSIP1;1	AQAVGAVGGALAITVEMPIQYKHM-----IGGPSLKVELHTGAVAEGILTFLIT
CpSIP3;1	AQAAGGAIGAMGIWQVMPVG--WL-----KGGPSLKVDWHTGALAEGLLAFAHC
CpSIP2;1	VQVIGSIVGVRFIETIPEAG-----LGPRLKVDIHQALTEGFLTFAIV

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	<u>TM5</u>	<u>HE</u>
SoPIP2;1	YTVFSATDPKRSARDS---HVPILAPLPIGFAVFMVHLATIP--ITGTGINPARSFGAAV	
AtTIP2;1	YTVYATAADPKKG-----SLGTIAPLAIGLIVGANILAAGP--FSGGSMNPARSFGPAV	
OsNIP2;1	FVTLAVATDTRAVG-----ELAGLAVGSAVCITISIFAGA--ISGGSMNPARTLGPAL	
CpPIP1;1	YTVFSATDAKRNARDS---HVPILAPLPIGFAVFLVHLATIP--ITGTGINPARSLGAAI	
CpPIP1;2	YTVFSATDAKRNARDS---HVPILAPLPIGFAVFLVHLATIP--ITGTGINPARSLGAAI	
CpPIP1;3	YTVLSATDAKRNARDS---HVPILAPLPIGFAVFLVHLATIP--ITGTGINPARSLGAAI	
CpPIP1;4	YTVFSATDAKRNARDS---HVPILAPLPIGFAVFLVHLATIP--VTGTGINPARSLGAAL	
CpPIP2;1	YTVFSATDPKRNARDS---HVPVLAPLPIGFAVFMVHLATIP--VTGTGINPARSFGAAV	
CpPIP2;2	YTVFAATDPKRNARDS---HVPVWAPLPIGFAVFMVHLATIP--ITGTGINPARSFGAAV	
CpPIP2;3	YTVFSATDPKRSARDS---HVPVLAPLPIGFAVFMVHLATIP--VTGTGINPARSFGAAV	
CpPIP2;4	YTVFSATDPKRSARDS---HVPVLAPLPIGFAVFMVHLATIP--ITGTGINPARSFGAAV	
CpPIP2;5	YTVFSATDPKRSARES---FIPVLAPLPIGLAVFMVHLATIP--ITGTGINPARSLGAAV	
CpTIP1;1	YTVYATAVDPKKG-----SLGTIAPIAIGFIVGANILAGGA--FDGASMNPAVSFGPAV	
CpTIP1;2	YTVYATAIDPKRG-----NIGIIAPIAIGFIVGANILAGGA--FDGASMNPAVSFGPAV	
CpTIP1;3	YTVYATAVDPKKG-----NLGTIAPIAIGFIVGANILAGGA--FDGASMNPAVSFGPAV	
CpTIP2;1	YTVYATAADPRKG-----SLGTIAPIAIGFIVGANILAAGP--FSGGSMNPARSFGPAV	
CpTIP6;1	YTVYATAADPKRG-----SLGIIAPIAIGFIVGANILAAGP--FSGGSMNPARSFGPAV	
CpTIP3;1	YTVYATTIDPKRG-----SIGIIGPLAIGLIVGGNILVGGP--FDGGSMNPARAFGPAL	
CpTIP4;1	FTVYATIVDPKKG-----SLDGLGPMLTGFFVVGANILAGGA--FSGASMNPARSFGPAL	
CpTIP5;1	YTIYAAG-DPRRG-----QMGAIGPLVIGMAAGANFLAAGP--FSGGSMNPAFAFGSAV	
CpNIP1;1	FIISGVATDNRAIG-----ELAGLAVGATVLLNVMFAGP--ISGASMNPARSLGPAI	
CpNIP2;1	FITSAVATDTKAVG-----ELAGIAVGSAVCITISILAGP--VSGGSMNPARSIGPAL	
CpNIP4;1	FVIFGASIDERAIG-----QLGGIAVGMTVMLNVFVAGP--ISGASMNPARSLGPAF	
CpNIP8;1	FVISGVATDNRAIG-----ELAGIAVGMTIILNVFVAGP--VSGASMNPARSIAPAI	
CpNIP5;1	FVITAVATDTRAVG-----ELAGIAVGATVMLNILVAGP--SSGGSMNPVRTLGPAV	
CpNIP6;1	FVVTAATDTRAVG-----ELAGIAVGATVMLNILIAGP--STGASMNPVRTLGPAL	
CpNIP7;1	FLSAALICEAHTIG-----HLSGFVVGIAIGLAVLITGP--VSGGSMNPARSLGPAI	
CpXIP1;1	FVAVNVAFDKRRSKELGVSKVCAQIAGAMALAVFVSITVTGQTAYAGAGLNPAKCFGAAI	
CpXIP2;1	FASIWVAFDYRQAKALGRFMVCLVIGVVVGLIVFVSTTVTATKGYAGVGMNPARCLGPAL	
CpSIP1;1	FAVLVIIILKGPRNS-----VLKTWLLAVATVALVLSGSA--YTGAMNPAIAFGWAY	
CpSIP3;1	LSVLVVVVRGPRSV-----FVKVLLLAMVTTGLVRVSGS--YTGPSLNPANAFGWAY	
CpSIP2;1	MISLGLAAKIPGSF-----FMKTIWISSVSKLALHILGSD--LTGCGMNPAVVMGWAF	

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# TM6

SoPIP2;1	IFNSNKVWDDQWIFWVGPFFIGAAVAAAYHQYVLRAAAI-----KALGSFRSNPTN---
AtTIP2;1	AAGD---FSGHWVYVWGPLIGGGLAGLIYGNVFMGSSE-----HVPLASADF-----
OsNIP2;1	ASNK---FDGLWIYFLGPVMTLSGAWTYTFIRFEDTPKEGSSQKLSSFKLRLRSQQSI
CpPIP1;1	IFNTDHAWDDHWIFWVGPFFIGAALAAYHQIVIRAIPF-----KTRA-----
CpPIP1;2	IYNDDTAWDDHWVFWVGPFFIGAALAALYHQIVIRAIPF-----KTRG-----
CpPIP1;3	IFNRDKAWDDHWIFWVGPFFIGAALAALYQQVVIRAIPF-----KSK-----
CpPIP1;4	IYNKSQAWDDHWIFWVGPFFIGAALAALYHQIVIRAIPF-----RSK-----
CpPIP2;1	IFNQDKPWDDHWIFWVGPFFIGAAIAAFYHQYVLRASGS-----KSLGSLRSSNI---
CpPIP2;2	IFNDEKAWDDHWIFWVGPFFIGAAIAAIYHQYVLRAAAI-----KALGSFRSNA----
CpPIP2;3	IFNDKKAWDDHWIFWVGPFFIGAAIAAFYHQFILRAAAV-----KALGSFRSQSHV---
CpPIP2;4	IWNNKKGWDDHWIFWVGPFVFGALAAAAYHQYILRAAAI-----KALGSFRSNPTN---
CpPIP2;5	VYNNQQVWDEQWIFWVGPFVFGALAAAAYHEYVLRAAAV-----KALLSFRPH-----
CpTIP1;1	VSWS---WDNHWVYVWAGPLIGGGLAGLIYDFFFIHS-----HEQLPTADY-----
CpTIP1;2	VSWT---WNSHWVYVWGPFAGAGIAALVYEIIFIGSST-----HEQLASADF-----
CpTIP1;3	VSWT---WTHHWVYVWGPFFIGAAIAAIVYDNIFIGNDS-----HEPLPTNDF-----
CpTIP2;1	ASGN---FCGIWIYVWGPLVGGGLAGLIYGNIFISS-----HQSLPSCD-----
CpTIP6;1	VSGD---FTDNWVYWLGPLVGGALAGLVYGDIFIGSYS-----PVSASQDYP-----
CpTIP3;1	VGWR---WRNHWIYVWGPFVGGGLAALVYEFMVIPSTTEPPLITGHQPLAPEDY-----
CpTIP4;1	VSWD---WTDHWVYVWGPLMGGGLAGFMYENFFIVRS-----HVLVSHQDDSC----
CpTIP5;1	VAGS---FKNQAVYVWGPLIGATIGGLLYDNVVPPEAIDS----LTGISERPVV-----
CpNIP1;1	VFSR---YKGIWIYIFSPVLGAISGAWVYNMVRITDKPLREITKSSSFLKSARS CST---
CpNIP2;1	ASQY---YKGIWVYLVGPVTGTLLGAYSYNLIRVKDEPVQAISPRSFSFKLRRMKS-HEE
CpNIP4;1	VKHE---FKGLWIYVIGPVAGAIAGASAYSLVRAGDRP-----SETLSFLTGSSK--
CpNIP8;1	VMHV---YKGLWVYIVGPPIGTILGGAAYNLIRFTDKPLREITRTGSFLKSISR RN----
CpNIP5;1	AAGN---YKAIWVYLLAPILGGLVGAGTYTAVKLRDDEAE---PPRQVRSFRR-----
CpNIP6;1	AANN---YKAIWVYLIAPILGALSAGIYTAVKLPEEDADTHEKPSTARSFRR-----
CpNIP7;1	VSWD---FDNIWIYMIAPVVGAIAGVLLYQFLRLKHRPCTATSSPSTVSYLVTP-----
CpXIP1;1	LQGG-LLWKGHVFWVGSFFACIVYYGFSLTLPKQGLDWVEGEYDAMRLAKACWGTKDFP
CpXIP2;1	IRGG-HLWSGHWVFWAGPVIACVAFALYIKMIPREHFHGGD-----
CpSIP1;1	QNNWHNSWEHFYVYVICPFIGAIFAALVFRIIFPPTVEVK-----KKKQKKA-----
CpSIP3;1	VKNWHNSLELYYVYVWGPLVGATMAAWVFRVLFAPSLVK-----KKKKKKKRE-----
CpSIP2;1	ARGDHITKEHIFVYWLAPVEATLLAVWTFKLVTKSLTED-----KAKLKAKSE-----

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