

1 MA-----GGQINLVLTLDQAKTQWYHFMAI VIAGMGFFTDAYDLFCISLVTKLLGRIYYTDDSKD-----TPGALPPNVSAAVTGVALCG OsPT1
1 MA-----GSQINLVVKLDQAKTQWYHFMAI VIAGMGFFTDAYDLFCIALVTKLLGRLYYTDITKE-----NPGTLPPNVSSAVTGVALCG OsPT2
1 MA-----DGQLKVLTTLDHARTQWYHFMAI VIAGMGFFTDAYDLFCISLVS KLLGRIYYTDLAGD-----NPGSLPPNVSAAVNGVALCG OsPT3
1 MA-----GELKVLNALS AKTQWYHFMAI VIAGMGFFTDAYDLFSLSVLVTKLLGRIYYFNPA SK-----SPGSLPPNVSAAVNGVAFVCG OsPT4
1 MV-----QDRKVLDA LDTAKTQWYHFMAI VIAGMGFFTDAYDLFSLSVLVTKLLGRIYYFNPA SK-----SPGSLPPNVSAAVNGVAFVCG OsPT5
1 MGGGGGEEQQLEVLHALDVAKTQWYHFMAI VIAGMGFFTDAYDLFCISLVTKLLGRIYYRVDGSP-----SPGTLPPHVSASVNGVAFVCG OsPT6
1 MAG-----DOMHVLSALDS AKTQWYHFMAI VIAGMGFFTDAYDLFCISLVTKLI GRVYYTADGAS-----KPGSLPPNVSAAVNGVAFVCG OsPT7
1 MARQE-QQOHLQVLSALDA AKTQWYHFMAI VIAGMGFFTDAYDLFCISLVTKLLGRIYYTDLAKE-----NPGSLPPNVAAAVNGVAFVCG OsPT8
1 MAP-----RIRVLAALDQARTQY YHFKA I VIAGMGLFTDSYDLFCISPVMKIFGRVYYAPSGSV DGS GSGPGVT PPAVVSATVGVALLG OsPT9
1 MAP-----IGVLTALDQARTQY YHFKA I VIAGMGLFTDSYDLFCIAPVMKIVGRVYY S-----DGGARPGVT PPAVVSATVGVALLG OsPT10
1 MADADG-GSNLAVLDALDSARTQMYHMKAI VIAGMGFFTDAYDLFCISTVSKLLGRLYYQPDGSTD---SKPGALSKTANMVI GVALVG OsPT11
1 MGRQD-QQ--LQVINALDA AKTQWYHFMAI VIAGMGFFTDAYDLFCISLVTKLLGRIYYTDPASF-----XPGSLPPNIAAAVNGVALCG OsPT12
1 MAGNQ----QLRVLHALDIARTQLYHFMAI VIAGMGFFTDAYDLFSLSVLADLLGHVYYH-----GELPRNIIHAAVTGIALCG OsPT13
1 MA-----EQQLGVLKALDVAKTQLYHFMAI VIAGMGFFTDAYDLFCVSLVTKLLGRIYYFNPE SA-----KPGSLPPHVA AVNGVALCG AtPT1

81 TLAGQLFFGWLGD-KLGRKSVYGF TLLMVVCSVASGLSFGSSAKGVVSTLCFFR FFWLGF GIGDYPLSATIMSEYANKRTRGAFIAAVE OsPT1
81 TLAGQLFFGWLGD-KLGRKSVYGF TLLMVVCSIASGLSFGHTPKSVIATLCFFR FFWLGF GIGDYPLSATIMSEYANKRTRGAFIAAVE OsPT2
81 TLAGQLFFGWLGD-KLGRKSVYGF TLLMVVCSVASGLSFGRIAKGVVAXLCFFR FFWLGF GIGDYPLSATIMSEYANKRTRGAFIAAVE OsPT3
80 TLAGQLFFGWLGD-KMGRKKVYGMTI LMLMVICCLASGLSFGSSAKGVMATLCFFR FFWLGF GIGDYPLSATIMSEYANKRTRGAFIAAVE OsPT4
80 TLAGQLFFGWLGD-KMGRKKVYGMTI LMLMVICCLASGLSFGSSAKGVMATLCFFR FFWLGF GIGDYPLSATIMSEYANKRTRGAFIAAVE OsPT5
86 TLSGQLFFGWLGD-KLGRKRVYGI TLLMVICSLASALSFGHTPTSVMATLCFFR FFWLGF GIGDYPLSATIMSEYANKRTRGAFIAAVE OsPT6
81 TLTGQLFFGWLGD-RVGRKSVYGMT LLLMVICSVASGLSFGHTPTSVMATLCFFR FFWLGF GIGDYPLSATIMSEYANKRTRGAFIAAVE OsPT7
85 TLAGQLFFGWLGD-KLGRKSVYGMT LLMVICSIASGLSFSHTPTSVMATLCFFR FFWLGF GIGDYPLSATIMSEYANKRTRGAFIAAVE OsPT8
85 AVAGNVVFGALGD-RVGRRRVYGAC LLLMVCSVSGLSVCRXRRCALASLCFFR FFWLGF VGVGGDYPLSATIMSEFANRTRGAFIAAVE OsPT9
78 AVIGNVVFGALGD-RVGRRRVYGAC LLLML--RRERLLRVPDAPVRRARQPL--LLPFL LGVGVGGDYPLSATIMSEFANRTRGAFIAAVE OsPT10
87 TLMGQLVFGYFGD-KLGRKRVYGV TLLMAACAIGSGLSFGSSRKA VIGTLCFFR FFWLGF GIGDYPLSATIMSEYSNKKRTRGAFIAAVE OsPT11
83 TLSGQLFFGWLGD-KLGRKSVYGMT LLLMVICSIASGLSFSHTPTSVMATLCFFR FFWLGF GIGDYPLSATIMSEYANKRTRGAFIAAVE OsPT12
75 TVPGQLVFGWLGATKWAGSVSMESPSSM VVSSLASGLSF-----IGGDYPLSATIMSEYANKRTRGAFIAAVE OsPT13
81 TLSGQLFFGWLGD-KLGRKKVYGL TLLVMVICSVASGLSFGHEAKGVMTTLCFFR FFWLGF GIGDYPLSATIMSEYANKRTRGAFIAAVE AtPT1

170 AMQGFGLFCAI VALAVSAGFRHAY PAPSYSNHAASL-VPOADYVWRI ILMFGTVPAA LTYWRM KMPETARYTALIARNAKQAAADMS OsPT1
170 AMQGFGLFCAI VALIVSAGFRHAY PAPSYAQNPAASL-APQADYTWR LIIMFGTIPAG LTYWRM KMPETARYTALVARNAKQAAADMS OsPT2
170 AMQGFGLFCAI VALIVSAGFRNAY PAPSADGRAASL-VPEADYVWRI ILMFGTVPAA LTYWRM KMPETARYTALIARNAKQAAADMS OsPT3
169 AMQGFGNLTGGIVA IIVSAAFKSRFDAPAYRDDRTGST-VPOADYAWRI VLMFGAIPALLTYWRM KMPETARYTALVAKNAKQAAADMT OsPT4
169 AMQGFGNLTGGIVA IIVSAAFKSRFDAPAYRDDRAXX----ADYAWRI VLMFGAIPALLTYWRM KMPETARYTALVAKNAKQAAADMA OsPT5
175 AMQGFGITGGVA IIVSAAFRAAFPAPPYGEDPVAST-PPQADYVWRI ILMGALPAALTYWRM KMPETARYTALVANNAKQAAADMS OsPT6
170 AMQGFGLLAGGAVA IIGITAI FRSRFPAPPFAADPAAST-PPQADYVWRI ILMGALPAALTYWRM KMPETARYTALVAKNAERAAADMS OsPT7
174 AMQGFGLLAGGIVT LIISSAFRAGFPAPAYQDDRAGST-VRQADYVWRI ILMGAMPALLTYWRM KMPETARYTALVAKNAKQAAADMS OsPT8
174 SMQGFGLI VSSAVTMAVA AAFDH-----YTGYPALDTP ECA DLAWRI ILMAGAVPAALTYWRM SMPETARYTALVERDVVKATNDIG OsPT9
164 SMQGFGLI VSSAVTMAVA AAFDH-----YTGYPALDTP ECA DLAWRI ILMAGAVPAALTYWRM SMPETARYTALVERDVVKATNDIG OsPT10
176 AMQGVGII FAGLVSMIVSSIFLTYNKAPSYKGNHDL SRQMPAADYVWRI VLMIGAFPALATFYWRM KMPETARYTALIDGNAKQAAANDMQ OsPT11
172 AMQGFGLLAGGVVTLAMSAGFQA AFPAPAYEVNAAAST-VPOADYVWRI ILMGALPAALTYWRM KMPETARYTALVAKDAKQASSDMA OsPT12
144 AMQGFGLNLAGI IGMIVSAAFKHS-----SASKIDYAWRI ILMFGAIPAA LTYWRM KMPETARYTALISKNAKKAADMS OsPT13
170 AMQGVGII LAGGFVALAVSSIFDKKFPAPTYAVNRALST-PPQVDYI WRI IVMFGALPAALTYWRM KMPETARYTALVAKNIKQATADMS AtPT1

259 KVLH----TQIEESADRAETVAVGEGS-----WGLFSRQFLRRHGLHL LATTSTWFLLDIAFY S QNLFQKDI FSKVGIWIPPAKTM-- OsPT1
259 KVLH----AEIEERPEVVESQVAVGET-----WGLFSRQFMKRHGMHL LATTSTWFLLDIAFY S QNLFQKDI FSKVGIWIPPAKTM-- OsPT2
259 KVLX----TEIQEDXERAEVAAGGAGNE-----WGLFSRQFVRRHGVHL VATTSTWFLLDIAFY S QNLFQKDI FSKVGIWIPPARTM-- OsPT3
258 QVLN----VEIVEEQEKA-----DEVARREQFGLFSRQFLRRHGRHLLGTTVCWFVLDIAFY S S NLFQKDIYTA VQWL PKADTM-- OsPT4
255 RVLN----VELVDEQEKA AATAA AEEEEARREQYGLFSRREFARRHGHL L GTTVCWFVLDIAFY S QNLFQKDIYTA VQWL PKADTM-- OsPT5
264 KVLQ----V-----VEMRNIGNNGGS-----RRPFGLSGFEFVRRHGLHL VGTSA TWLLLDIAFY S QNLFQKDI FSAVGIWIPKAATM-- OsPT6
259 KVLQ----VKITAEQAEMSPVDPKFFT-----SKPFGLSGFEFARRHGHL L GTTSTWLLLDIAFY S QNLFQKDI FSAIGWIPEAKTM-- OsPT7
263 KVLQ----VEIQEEQDKLEQMVTRNSSS-----FGLFSRQFARRHGLHL VGTATTWFLLDIAFY S QNLFQKDI FTSINWIPKAKTM-- OsPT8
258 RVLADLDLAAVAEE EAAAA LSPPPVTPPPRPSYGLFSRREFVRQ HGRDLFACAAA WFLLDIPYSS TLFQSQIYRP--WFPAAKV-- OsPT9
248 RVLADLDLGAVAEE EAAAA -LSRPP----PPRPSYGLLSRREFVRQ HGRDLFACAAA WFLLDIPYSS TLFQSQIYRP--LFPAPGLI-- OsPT10
266 KVL S----IEIEAEQEKLAKFNAA-----NNYPLLSMEFARRHGLHL IGT TTTWFLLDIAFY S QNLTQKDI FPA GLISGAEV-- OsPT11
261 KVLQ----VEIEVEEKLQD-ITR-GRD-----YGLFSARFAKRHGHAL LGTAATWFLVDVAYYSQNLFQKDI FTSIHWIPKARTM-- OsPT12
220 AVLN----VNI TPDEVI-----NELARQDEYGLFSFEFLHRHGLHL L GTTVCWFVLDVTFYSLNIFMKNIFTEVGLLPRLDSEYH OsPT13
259 KVLQ----TDIELE-ERVEDDVKDPKQN-----YGLFSKEFLRRHGLHL L GTTSTWFLLDIAFY S QNLFQKDI FSAIGWIWIPKAATM-- AtPT1

335 NALEELYRIARAQALIALCGTIPGYWFTVAFIEIMGRFWIQIMGFAMMTAFMLGLAIPYH-HWTTTPG-HHTGFIIMYMGFTFFFANFGPNS OsPT1
 335 NALEELYRISRQAALIALCGTIPGYWFTVAFIDIVGRFWIQIMGFMMTVFMLALGVPYD-HWTHFA-HHTGFVVLYALTFFFANFGPNS OsPT2
 337 NAVEEVFRIARAQALIALCGTIPGYWFTVAFIDVAGRFALQIMGFAMMTVFMGLAAPYH-HWTTTPG-NHTGFVVMYMGFTFFFANFGPNA OsPT3
 333 SALEEMFKISRQTLVALCGTIPGYWFTVFFIDIIGRFVIQLGGFFMTAFMLGLAVPYH-HWTTTPG-NHIGFVVMYAFFFFANFGPNS OsPT4
 339 SALEEMFKISRQTLVALCGTIPGYWFTVLFIDIVGRFAIQIGGFLLMTAFMLGLAVPYH-HWTTTPG-NHVGFFVVMYAFFFFANFGPNS OsPT5
 337 SALEELFRIARAQTLIALCGTIPGYWFTVALIDVGRFKIQAVGFFMMTLFMLTLALPYH-HWTAPGKNHVGFLLLYGLTFFFANFGPNS OsPT6
 338 SALDELYHIARAQTLIALCGTIPGYWFTVALIDVGRFKIQAGFFVMTAFMLALAVPYD-HWTAAG-NQIGFVVLYALTFFFANFGPNA OsPT7
 340 SALEEVFRIARAQTLIALCGTIPGYWFTVFLIDIVGRFAIQLLGFFMMTVFMLGLAVPYH-HWTTKG-NHIGFVVMYAFFFFANFGPNS OsPT8
 344 NAFQEA FNVAKFQAVIAVASTIPGYFAAMLLIERAGRRLQOMAGFLLMAVFLFALAGPYDGYWRDHAK-TAGYIVLYSLTFFSANLGPNT OsPT9
 329 NAFQEA FNVAKFQAVIAVASTIPGYFVAVLLIDRVGRCLQOMAGFLLMAVFLFALAGPYDGYWRDHGA-HAGYIVLYSLTFFSANLGPNT OsPT10
 341 NALTEMFQISKASFLVALLGTFPGYWTVVALIDKMGRYMQLIGFFMMSMFMLAMGILYD-YLKT---HIFLFGLLYALTFFFANFGPNS OsPT11
 336 SELEEVFRISRQTLIALCGTIPGYWFTVFLIDIIGRFKIQLLGFAGMTAFMLGLAIPYH-HWTPMG-NQVIFVFLYGFFFFANFGPNA OsPT12
 297 HTLQRMITMTAVHTFISLCCALPGYFFTVAFVDRIGRVKIQLLIGFTMMTVFMLCLAI PYD-QWL-RHKNKYGFVVMYGLTFFFANFGPNT OsPT13
 335 NATHEVFRIARAQTLIALCSTVPGYWFTVAFIDTIGRFKIQNGFFMMTVFMFAIAFPYN-HWIKFE-NRIGFVVMYSLTFFFANFGPNA AtPT1

423 TTFIVPAE IYPARLRSTCHGISAAAGKAGAIIGAFGFLYAAQDQHKP--EP-GYPRGI-GIKNALFVLAGTNFLGTIMT-LLVPESKGMS OsPT1
 423 TTFIVPAE IYPARLRSTCHGISAAAGKAGAIIGAFGFLYAAQDQHNP--DA-GYSRGI-GIRNALFVLAGTNFLGMLMT-LLVPESKGLS OsPT2
 425 TTFIVPAE IYPARLRSTCHGISAAAGKAGAI V GAFGFLYAAQDPHKP--EA-GYKPGI-GIRNALFVLAGTXFLGMLMT-LLVPESKGMS OsPT3
 421 TTFIVPAE IYPARLRSTCHGISAAAGKAGAI VGSFGFLYAAQSDASKTDA-GYPPGI-GVRNSLFFLAGCNVIGFFFTF-LVPESKGKS OsPT4
 427 TTFIVPAE IYPARLRSTCHGISAAAGKAGAI VGSFGFLYAAQSDPSKTDA-GYPRGI-GVRNSLFFLAGCNVVGFLFTF-LVPESKGKS OsPT5
 426 TTFIVPAE IYPARLRSTCHGISAAAGKAGAI VGSFGFLYLAQSPDRSKTE-HGYPPGI-GVRNSLFFLAGCNLLGLLFTF-LVPESKGKS OsPT6
 426 TTFIVPAE IYPARLRSTCHGISAAAGKAGAI VGSFGFLYLAQSPVPAKAAAHGYPPGI-GVRNSLFFLAGCNLLGLLFTF-LVPESKGKS OsPT7
 428 TTFIVPAE IYPARLRSTCHGISAAAGKAGAIIGSFGFLYAAQDPHKP--DA-GYKPGI-GVRNSLFFLAGCNLLGLICTF-LVPESKGKS OsPT8
 433 TTFILPAELFPARFRSTCHGLSGAAGKLGALVSGIFLWASQQKDG---AAGHLPGI-GMMYALFVLGGICLLGLALTYAFTPETMTRS OsPT9
 418 TTFILPAELFPARFRSTCHGLSGAAGKLGALVSGIFLWASQQKDG---AAGHLPGI-GMMYALFVLGGICLLGLALTYVFTPETMTRS OsPT10
 427 TTFVLP AELFPTRVRSTCHASAAAGKAGAI VAAF-----IQKLTNSQVKSIIKAI ILSITNMLGFFFTF-LVPETMGRS OsPT11
 424 TTFIVPAE IYPARLRSTCHGISAAAGKAGAIIGAFGFLYAAQPDKAHVDA-GYKPGI-GVRNALFVLGCNLVGFIMTWMLVPESKGKS OsPT12
 385 TTFIIPAE IYPARLRSTCHGISGAVGKIGAI VGVFGFLYTE-----YH-----IRIFLFLVLI GCNLVGFIFTL-LVPESKGKS OsPT13
 423 TTFIVPAE IYPARLRSTCHGISAAAGKAGAI V GAFGFLYAAQSQDKAKVDA-GYPPGI-GVKNSLIMLGVNFI GMLFTF-LVPEPKGKS AtPT1

508 LEV----ISQEVADGDDEEAAYPK OsPT1
 508 LEE----MSKDNVDETAQEAIAQA OsPT2
 510 LEE----VSKENVADDEEATA OsPT3
 508 LEE----LSGENEDDDVPEAPATADHRTAPAP--PA OsPT4
 514 LEE----LSGENEMEA E-PAATNSYRQTV PDSQSE OsPT5
 513 LEE----MSGDAEAQE EAP-----PPLQTVL OsPT6
 514 LEE----MSRENEVGQP OsPT7
 513 LEE----MSGEAEDDDD-EVAAAGGGAAVRP---QTA OsPT8
 519 LEENESSVQAQSQVGGSDAGNGSDGLRFHELNLVMEATKSPVSMASHLSMSPILPHRMSL OsPT9
 504 LEENESD-RAQTQVGGSDTE-----AAKSPASMASHLSMSPILPARVSV OsPT10
 504 LEE----ISGEDGNTGAGGGGAPAAANAGVGV SASDVS RDEKFPASSTEWQTSMH-----A OsPT11
 512 LEE----MSGEA--DDE-EASANGGATAVNSSGVEMV OsPT12
 457 LED----LTGEIEEFQEEDEGSEVALSRPIHT-----VP-----L OsPT13
 510 LEE----LSGAEVSHD-EK AtPT1