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                                                  10        20        30        40        50        60        70        80
Cyanobacterium_aponinum_0216_PsaA   1 MTVSP-QKEAKAKVIVDKDPVPTSFEKWGKPGHFDRTLARGPKTTTWIWNLHADAHDFDSQTSDLEDISRKIFSAHFGHLAVVFVWLS  87
Synechocystis_6803_PsaA             1 MTISPPEREAKAKVSVDNNPVPTSFEKWGKPGHFDRTLARGPKTTTWIWNLHANAHDFDSQTSDLEDVSRKIFSAHFGHLAVVFVWLS  88

                                        90       100       110       120       130       140       150       160       170
Cyanobacterium_aponinum_0216_PsaA  88 GMYFHGAKFSNYSAWLADPLNIKPSAQVVWPVVGQDILNADVGGGFHGIQITSGFFQLWRASGITNEYQLYCTAIGGLVMAGLMLFAG 175
Synechocystis_6803_PsaA            89 GMYFHGAKFSNYEGWLADPTHIKPSAQVVWPIVGQGILNGDVGGGFHGIQITSGLFYLWRASGFTDSYQLYCTAIGGLVMAALMLFAG 176

                                       180       190       200       210       220       230       240       250       260
Cyanobacterium_aponinum_0216_PsaA 176 WFHYHKAAPKLEWFQNVESMMNHHLAGLLGLGSLGWAGHQIHVSLPINKLLDAGVAPNEIPLPHEFILDPAKMAELYPSFAQGLTPFF 263
Synechocystis_6803_PsaA           177 WFHYHVKAPKLEWFQNVESMMNHHLAGLLGLGSLGWAGHQIHVSMPINKLLDAGVAPKDIPLPHEFILEPSKMAELYPSFAQGLTPFF 264

                                       270       280       290       300       310       320       330       340       350
Cyanobacterium_aponinum_0216_PsaA 264 TLNWGVYSDFLTFKGGLNPVTGGLWLSDTAHHHLAIAVLFIIAGHMYRTNWGIGHNMKEILEGHKGPFTGEGHKGLYEILTTSWHAQL 351
Synechocystis_6803_PsaA           265 TLNWGVYSDFLTFKGGLNPVTGGLWLSDTAHHHLAIAVLFIIAGHMYRTNWGIGHSMKEILEAHKGPFTGEGHKGLYEILTTSWHAQL 352

                                       360       370       380       390       400       410       420       430
Cyanobacterium_aponinum_0216_PsaA 352 AINLALLGSLTIIVAQHMYAMPPYPYLATDYGTQLSIFTHHMWIGGFLIVGAGAHASIFMVRDYDPAKNVNNLLDRVLRHRDAIISHL 439
Synechocystis_6803_PsaA           353 AINLALLGSLTIIVAQHMYAMPPYPYQAIDYATQLSLFTHHMWIGGFLIVGAGAHGAIFMVRDYDPAKNVNNLLDRMLRHRDAIISHL 440

                                       450       460       470       480       490       500       510       520
Cyanobacterium_aponinum_0216_PsaA 440 NWVCIWLGFHSFGLYIHNDTMRALGRPQDMFSDSAIQLQPVFAQWIQGLHAAAAGATAPFASAGVSPVFGGEVVAVGGKVAMMPITLG 527
Synechocystis_6803_PsaA           441 NWVCIFLGFHSFGLYIHNDTMRALGRPQDMFSDTAIQLQPIFAQWVQHLHTLAPGATAPNALATASYAFGGETIAVAGKVAMMPITLG 528

                                       530       540       550       560       570       580       590       600       610
Cyanobacterium_aponinum_0216_PsaA 528 TADFMVHHIHAFTIHVTVLILLKGVLYSRSSRLIPDKAELGFRFPCDGPGRGGTCQVSGWDHVFLGLFWMYNSLSIVIFHFSWKMQSD 615
Synechocystis_6803_PsaA           529 TADFMVHHIHAFTIHVTALILLKGVLYARSSRLVPDKANLGFRFPCDGPGRGGTCQVSGWDHVFLGLFWMYNSLSVVIFHFSWKMQSD 616

                                       620       630       640       650       660       670       680       690       700
Cyanobacterium_aponinum_0216_PsaA 616 VWGTVLPDGSVSHITGGNFAQSAITINGWLRDFLWAQAANVINSYGSALSAYGIMFLAGHFVFAFSLMFLFSGRGYWQELIESIVWAH 703
Synechocystis_6803_PsaA           617 VWGTVSPDGSVTHVTLGNFAQSAITINGWLRDFLWAQAANVINSYGSALSAYGIMFLAGHFVFAFSLMFLFSGRGYWQELIESIVWAH 704

                                       710       720       730       740       750
Cyanobacterium_aponinum_0216_PsaA 704 NKLKLAPAIQPRALSIVQGRAVGVAHYLLGGIVTTWAFFLCRILSVG                                            750
Synechocystis_6803_PsaA           705 NKLNVAPAIQPRALSIIQGRAVGVAHYLLGGIVTTWAFFLARSLSIG                                            751

                                                  10        20        30        40        50        60        70        80
Cyanobacterium_aponinum_0216_PsaB   1 MATKFPKFSQDLAQDPTTRRIWYGIATAHDFETHDGMTEENLYQKIFASHFGHLAIIFLWTSGTVFHVAWQGNFEQWIKDPLNVRPIA  88
Synechocystis_6803_PsaB             1 MATKFPKFSQDLAQDPTTRRIWYGIATAHDFETHDGMTEENLYQKIFASHFGHIAIIFLWTSGTLFHVAWQGNFEQWIKDPLNIRPIA  88

                                        90       100       110       120       130       140       150       160       170
Cyanobacterium_aponinum_0216_PsaB  89 HAIWDPHFGQGAVDAFTQAGASSPVNVAYSGVYHWFYTIGMTNNQDLYQGAVFLLILSALFLFAGWLHLQPKFRPSLSWFKNAESRLN 176
Synechocystis_6803_PsaB            89 HAIWDPHFGEGAVNAFTQAGASNPVNIAYSGVYHWFYTIGMTTNQELYSGAVFLLVLASLFLFAGWLHLQPKFRPSLAWFKNAESRLN 176

                                       180       190       200       210       220       230       240       250       260
Cyanobacterium_aponinum_0216_PsaB 177 HHLAGLFGVSSLAWTGHLVHVAIPESRGVHVGWDNFLSVKPHPAGLAPFFTGNWGVYAQNPDTASHVFGTSEGAGSAILTFLGGFHPQ 264
Synechocystis_6803_PsaB           177 HHLAGLFGVSSLAWAGHLVHVAIPEARGQHVGWDNFLSTPPHPAGLMPFFTGNWGVYAADPDTAGHIFGTSEGAGTAILTFLGGFHPQ 264

                                       270       280       290       300       310       320       330       340       350
Cyanobacterium_aponinum_0216_PsaB 265 TESLWLTDIAHHHLAIAVIFIVAGHMYRTNWGIGHSIKDILAAHNPPQGTPFGGALGAGHRGLYDTINNSLHFQLGLALASLGVITSL 352
Synechocystis_6803_PsaB           265 TESLWLTDIAHHHLAIAVIFIIAGHMYRTNWGIGHSIKEILNAHKGPL-------TGAGHTNLYDTINNSLHFQLGLALASLGVITSL 345

                                       360       370       380       390       400       410       420       430
Cyanobacterium_aponinum_0216_PsaB 353 VAQHMYSLPSYAFIAKDYTTQAALYTHHQYIAGFLMVGAFAHGAIFFVRDYDPEANKDNVLARMLEHKEAIISHLSWVSLFLGFHTLG 440
Synechocystis_6803_PsaB           346 VAQHMYSLPSYAFIAQDHTTQAALYTHHQYIAGFLMVGAFAHGAIFFVRDYDPVANKDNVLARMLEHKEALISHLSWVSLFLGFHTLG 433

                                       450       460       470       480       490       500       510       520
Cyanobacterium_aponinum_0216_PsaB 441 LYVHNDVVVAFGTPEKQILIEPVFAQFVQAASGKALYGFDALLSNPDSVASTASAVWLPGWLDAINSGTNSLFLNIGPGDFLVHHAIA 528
Synechocystis_6803_PsaB           434 LYVHNDVVVAFGTPEKQILIEPVFAQWIQATSGKALYGFDVLLSNPDSIASTTGAAWLPGWLDAINSGTNSLFLTIGPGDFLVHHAIA 521

                                       530       540       550       560       570       580       590       600       610
Cyanobacterium_aponinum_0216_PsaB 529 LGLHTTTLILVKGALDARGSKLMPDKKDFGFSFPCDGPGRGGTCDISAWDAFYLAMFWMLNTLGWLTFYWHWKHLGIWTGNVAQFNEN 616
Synechocystis_6803_PsaB           522 LGLHTTALILIKGALDARGSKLMPDKKDFGYSFPCDGPGRGGTCDISAWDAFYLAMFWMLNTLGWLTFYWHWKHLGVWSGNVAQFNEN 609

                                       620       630       640       650       660       670       680       690       700
Cyanobacterium_aponinum_0216_PsaB 617 STYLMGWFRDYLWANSAQLINGYNPYGVNNLSVWAWMFLFGHLVWATGFMFLISWRGYWQELIETIVWAHERTPLANLVRWKDKPVAL 704
Synechocystis_6803_PsaB           610 STYLMGWFRDYLWANSAQLINGYNPYGVNNLSVWAWMFLFGHLVWATGFMFLISWRGYWQELIETIVWAHERTPLANLVRWKDKPVAL 697

                                       710       720       730
Cyanobacterium_aponinum_0216_PsaB 705 SIVQARLVGLAHFTVGYILTYAAFLIASTAGKFG                                                          738
Synechocystis_6803_PsaB           698 SIVQARLVGLAHFTVGYVLTYAAFLIASTAGKFG                                                          731

                                                  10        20        30        40        50        60        70        80
Cyanobacterium_aponinum_0216_PsaC   1 MSHSVKIYDTCIGCTQCVRACPLDVLEMVPWDGCKAGQIASSPRTEDCVGCKRCETACPTDFLSIRVYLGAETTRSMGLAY          81
Synechocystis_6803_PsaC             1 MSHSVKIYDTCIGCTQCVRACPLDVLEMVPWDGCKAAQIASSPRTEDCVGCKRCETACPTDFLSIRVYLGAETTRSMGLAY          81

                                                  10        20        30        40        50        60        70        80
Cyanobacterium_aponinum_0216_PsaD   1 MSETIQLTGTMPKFGGSTGGLLSAADREEKYAITWTSKTEQVFEMPTGGAAIMNEGENLLYFARKEQCLALGTQLRTKFKPKIEDYKI  88
Synechocystis_6803_PsaD             1 MTE---LSGQPPKFGGSTGGLLSKANREEKYAITWTSASEQVFEMPTGGAAIMNEGENLLYLARKEQCLALGTQLRTKFKPKIQDYKI  85

                                        90       100       110       120       130       140
Cyanobacterium_aponinum_0216_PsaD  89 YRIYPTGETQYLHPADGVFPEKVNEGREFHGKKDRNIGKNPEPVTLKFSGKTPYDV                                   144
Synechocystis_6803_PsaD            86 YRVYPSGEVQYLHPADGVFPEKVNEGREAQGTKTRRIGQNPEPVTIKFSGKAPYEV                                   141

                                                  10        20        30        40        50        60        70
Cyanobacterium_aponinum_0216_PsaE   1 MAIQRGSKVRILRKESYWYKDVGTVASVDKSGILYPVIVRFDKVNYNGFSGSATGVNTNNFAEHELEEVAAPAKK                 75
Synechocystis_6803_PsaE             1 MALNRGDKVRIKRTESYWYGDVGTVASVEKSGILYPVIVRFDRVNYNGFSGSASGVNTNNFAENELELVQAAA-K                 74

                                                  10        20        30        40        50        60        70        80
Cyanobacterium_aponinum_0216_PsaF   1 MRKIFSLVLAFTLSITLWFNFAPAAQA-DLSHLTPCSESPAYQAKAKSFRNTTSDPESGQKRAESYAEALCGPEGYPHLVVDGRLDHA  87
Synechocystis_6803_PsaF             1 MKHLLALLLAF----TLWFNFAPSASADDFANLTPCSENPAYLAKSKNFLNTTNDPNSGKIRAERYASALCGPEGYPHLIVDGRFTHA  84

                                        90       100       110       120       130       140       150       160
Cyanobacterium_aponinum_0216_PsaF  88 GDFIIPGLLFLYVAGWIGWVGRSYLIAIREEKDTEMKEIIIDVPLAINKMLFGFMWPLQAFGEFTSGKLTVKDSEIPVSPR         168
Synechocystis_6803_PsaF            85 GDFLIPSILFLYIAGWIGWVGRSYLIEIRESKNPEMQEVVINVPLAIKKMLGGFLWPLAAVGEYTSGKLVMKDSEIPTSPR         165

                                                  10        20        30        40
Cyanobacterium_aponinum_0216_PsaI   1 MILGDFAASFLPAILVPAVGLVMPAVVMGLLFLQIESE--A                                                   39
Synechocystis_6803_PsaI             1 M-DGSYAASYLPWILIPMVGWLFPAVTMGLLFIHIESEGEG                                                  40

                                                  10        20        30        40
Cyanobacterium_aponinum_0216_PsaJ   1 MKGLTTFLSTAPVLITALLVFTAGLLIEFNRFYPDLLFHP                                                   40
Synechocystis_6803_PsaJ             1 MDGLKSFLSTAPVMIMALLTFTAGILIEFNRFYPDLLFHP                                                   40

                                                  10        20        30        40        50        60        70        80
Cyanobacterium_aponinum_0216_PsaK   1 ------------------------------------KSMLYLNSLLATAVPTTLEWNLNVGLTMIVCNIVAIAFAKYTMKEPGAGPK-  51
Synechocystis_6803_PsaK             1 MTAIARERGRSKRGIALHRLEYLKENQVFEIIFGEPLSMFNTALLLAQASPTTAGWSLSVGIIMCLCNVFAFVIGYFAIQKTGKGKDL  88

                                        90       100       110       120
Cyanobacterium_aponinum_0216_PsaK  52 -LPGEAFFGGMGLPALLATTSFGHLLGAGVILGLASLGAL                                                  90
Synechocystis_6803_PsaK            89 ALPQLASKKTFGLPELLATMSFGHILGAGMVLGLASSGIL                                                  128

                                                  10        20        30        40        50        60        70        80
Cyanobacterium_aponinum_0216_PsaL   1 KTMSIDVVN-HGGDPQVGNLSTPINGSAFTKAFINALPAYRKGLSPNRRGLEVGMAHGYLLYGPFAVLGPLRLTEYGPTAGLLATIGL  87
Synechocystis_6803_PsaL             1 MAESNQVVQAYNGDPFVGHLSTPISDSAFTRTFIGNLPAYRKGLSPILRGLEVGMAHGYFLIGPWTLLGPLRDSEYQYIGGLIGALAL  88

                                        90       100       110       120       130       140       150       160
Cyanobacterium_aponinum_0216_PsaL  88 VSILTICLSIYGAVGVSKPTETLTTPEVPMDLATKEGWSEFAGGFLLGGCGGAFFAFFLCQTPHLQPLIEVASNIWSS---      165
Synechocystis_6803_PsaL            89 ILVATAALSSYGLVTFQGEQGSG------DTLQTADGWSQFAAGFFVGGMGGAFVAYFLLENLS------VVDGIFRGLFN      157

                                                  10        20        30
Cyanobacterium_aponinum_0216_PsaM   1 MSISETQVFVALVIALIPGILAFRLATELYK                                                            31
Synechocystis_6803_PsaM             1 MALSDTQILAALVVALLPAFLAFRLSTELYK                                                            31
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