

Supplemental Figure 1

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<i>Synechocystis</i> PCC 6803	...	KIRTVSDAKRKFTHYSRPISSIIYRRFVEELLVEMHLLSVNIDFTYDPIFALGIVTSFNSFMQGYQPAEQLPFAIFNALCHGVDQNPQVQRQDAKNV...																																																																																																					
<i>Prochlorococcus marinus</i> CCMP1375	...	EQTTSIDSKGLFHKEFPYVIPVYRKRVLDEYLVELNLLSNQSNFKIDTIFSYGLIISFERFTVGYEPDSHISKILESLCNSCNIDKAIKEYSNNI...																																																																																																					
<i>Prochlorococcus marinus</i> CCMP1986	...	EKLTVSDSKLFLHEQFPYVIPGLYKRIVDEMLVELNLLNHQNEFIQDDLFCVGLTETTFKELTKGYKPEEHLRVLFEESLNSNSNFEPPKKIKEASKKT...																																																																																																					
<i>Prochlorococcus marinus</i> MIT9313	...	DRKTIADSKRAFNDHDFPHVIPSLYRRRTDELLELVELHLLSHQKHFHPDALFAIGLSQVFDVFTSGYRPEAHVKTLPFDALCRSCGFDPNALRQAAQQT...																																																																																																					
<i>Synechococcus</i> WH8102	...	ERHTIADSKRAFHQAFPHVIAPLYRRIADELLVELHLLSHQATFQANSLSFAVGLKTVFERFTQGYRPEMHPAALLSALCSSNGFDDEQLKQAAQHC...																																																																																																					
<i>Anabaena</i> PCC 7102	...	LLRTVSDTKRFFYALHTRPINTIYRRVVEELMVEMHLLSVNVDYSNPIYALGVVTFDFRMEGYQPERDKESIFSAICQAVEQEPQRYRQDAERL...																																																																																																					
<i>Anabaena variabilis</i> ATCC29413	...	LLRTVSDTKRFFYALHTRPINTIYRRVVEELMVEMHLLSVNVDYSNPIYALGVVTFDFRMEGYQPERDKESIFSAICQAVEQEPQRYRQDAERL...																																																																																																					
<i>Nostoc punctiforme</i> PCC 73102	...	NVRTVSDTKRFFYNLHTRPINTIYRRVVEELMVEMHLLSVNIDFSYNPIYALGVVTFDFRMEGYQPERDQESIFNALCRAIEQDPQHYRQDAERL...																																																																																																					
<i>Crocospaera watsonii</i> WH8501	...	NIRTVSDTKRFFYGYHTQPINSIYRRFVEELLVEMHLLSVNIDFSYDPIYALGVVTFQRFMQGYSPESDKPSIFNALCQAVDGSSEKHYQEAIAI...																																																																																																					
<i>Tricodesmium ertythraeum</i> IMS101	...	NTRTVSDTKKTFYHFHTRPINSIYRNVIEELLVEMHLLSVNVDYSNPFYALGVVTFDFRMEGYQPERDKESIFNALIQQEEEDPNKYRSDAKGL...																																																																																																					
<i>Synechococcus elongatus</i> PCC 7942	...	SVPTVSDSKRAFYAAYPRPINFLYRRVVEELLVEMHLLSVNIDFSYDPIYALGVVTFDFRMEGYQPERDQESIFNALCQAVEQEPQRYRQDAERL...																																																																																																					
<i>Thermosynechococcus elongatus</i> BP1	...	NPRTVSDTKRAFYAATHRPIHSIYRRFIEELLVIEHLLRVNVDYRYSPLFALGVVTFDFRMEGYQPEGDRDRIFHALCVAEEMNPQQLKEDAAQSW...																																																																																																					
<i>Gloeobacter violaceus</i> PCC 7421	...	SKRTVSDSKRAFFAAYPRPVNSIYRRVIDELLVVEHLLITNQDFRHDPLFATGLLTAYQALMEGYTPVEQRDAILRALCTALELSYQLHTDAAQW...																																																																																																					
<i>Solanum tuberosum</i>	...	DLPTVADTKLFLKFLTAYKRPIPTVYNTVLQELLVQQLHLMRYKSTYQYDVPVDFALGFVTVYDQLMEGYPSSEEDRNAIFKAYIEALKEDPEQYRADAQKL...																																																																																																					
<i>Triticum aestivum</i>	...	IPPTVADTKMNFLLKSYKRPISYISTVLQELLVQQLHLMRYKSTYQYDVPVDFALGFVTVYDQLMEGYPSSTEDRDAIFKSYVTALNEDPEQYRADAQRM...																																																																																																					
<i>Oryza sativa</i> (japonica)	...	VPPTVAETKMNFLKSYKRPILSIYSTVLQELLVQQLHLMRYKSTYQYDVPVDFALGFVTVYDQLMEGYPSNEDRDAIFKAYITALNEDPEQYRADAQKM...																																																																																																					
<i>Chlamydomonas reinhardtii</i>	...	KPPTVAETKAKFLSGYNKPIASIYSTVLQELLVQQLHFMRYSKNYQYNPIFALGFVSVYEQILELSLAAE-RGAIKAYVDALGEDADKYKRDAASAL...																																																																																																					
<i>Arabidopsis thaliana</i>	...	DVPPVSETKSKFLKAYKRPIPSIYNTVLQELLVQQLHLMRYKSTYQYDVPVDFALGFVTVYDQLMEGYPSDQDRDAIFKAYIEALNEDPKQYRIDAQKM...																																																																																																					
<i>Chlorella virus</i> PBCV-1	...	SPPTVSDTKRIFANYKLLFLYNTPIQNMLVKQHIHRYNKNYTSDVSALGIVTTLDSVLNTPFDDDE-KTSIKNAFIIISLNEDEPEMYYSNIESL...																																																																																																					
<table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;"></td> <td style="width: 10%; text-align: center;">135</td> <td style="width: 10%; text-align: center;">153</td> <td style="width: 10%; text-align: center;">170</td> <td style="width: 10%; text-align: center;">219</td> </tr> <tr> <td><i>Synechocystis</i> PCC 6803</td> <td>...</td> <td>RHKFKYSRLFAIGLYTLA</td> <td>...</td> <td>LTRLSELDSLKDVVKDLDLYRSNLEKVDQLKLVLEDAEAERKKKEKQ...</td> </tr> <tr> <td><i>Prochlorococcus marinus</i> CCMP1375</td> <td>...</td> <td>GDKKYSSLRHLAIGIYELIS</td> <td>...</td> <td>ISECVEALGFSKDRVEKIDINQYKNSMEKIKEMMELIKLTVETTKRKAKLN</td> </tr> <tr> <td><i>Prochlorococcus marinus</i> CCMP1986</td> <td>...</td> <td>DSNLYSSRLNLNGIYILIIA</td> <td>...</td> <td>ISDIINKLNLNFKNAEKDIDIGIYKSSILKMEQAKELLQEAIKDKKEKKK-</td> </tr> <tr> <td><i>Prochlorococcus marinus</i> MIT9313</td> <td>...</td> <td>STTFHYSRLMAVGLLSLLA</td> <td>...</td> <td>AHELSESVGFSKARVEKDLNLYKSNLEKMAQAVELTEQILESERKKREQN...</td> </tr> <tr> <td><i>Synechococcus</i> WH8102</td> <td>...</td> <td>SDGAHYSRLMAVGLLALLE</td> <td>...</td> <td>AVKLSVDLGLPAERVEKDLTVFSSNSERMEQAVELMQETLAADRKKKEKR...</td> </tr> <tr> <td><i>Anabaena</i> PCC 7102</td> <td>...</td> <td>NSNFKYSRLFAIGLFTLLE</td> <td>...</td> <td>LKSI AAGLHLSDDKFSKDLLEYRSNLDKMTQALAVMADMLTADRKKREQR...</td> </tr> <tr> <td><i>Anabaena variabilis</i> ATCC29413</td> <td>...</td> <td>NPNFKYSRLFAIGLFTLLE</td> <td>...</td> <td>LKTI AAGLHLSDDKLSKDLLEYRSNLDKMTQALAVMADMLTADRKKREQR...</td> </tr> <tr> <td><i>Nostoc punctiforme</i> PCC 73102</td> <td>...</td> <td>NPNFKYRNLFAIGVFSLLE</td> <td>...</td> <td>LKAI AAGLHVSDDKLNKDLLEYRSNLDKMAQALVVMADMLSADRKKREQR...</td> </tr> <tr> <td><i>Crocospaera watsonii</i> WH8501</td> <td>...</td> <td>NPKFKYSRLLAIGLYTLLM</td> <td>...</td> <td>IKEVSEALKFSPEKLRKDLDLYRSNLDKMQQLLTVIEDSLEADRKKRAST...</td> </tr> <tr> <td><i>Tricodesmium ertythraeum</i> IMS101</td> <td>...</td> <td>NSKFRYSRLFAIGLFTLLE</td> <td>...</td> <td>LKKICQSLNVEKLLKIDIDLYLSNLERVAQARSAMEDTLAAMRKKREKR...</td> </tr> <tr> <td><i>Synechococcus elongatus</i> PCC 7942</td> <td>...</td> <td>RSEFKYSRLFAIGLFSLLE</td> <td>...</td> <td>VTAIAERFHLPSDKLQKDLDLYRSNLEKMEQARITMEEAIQADRKKREQR...</td> </tr> <tr> <td><i>Thermosynechococcus elongatus</i> BP1</td> <td>...</td> <td>NHTGKYSRLHAVGLYAFLO</td> <td>...</td> <td>LDQLAPVILPLPIEKVKRDLLEYRSNLDKINQARSLMKELVEQERKKRAQQ...</td> </tr> <tr> <td><i>Gloeobacter violaceus</i> PCC 7421</td> <td>...</td> <td>AERFKYSRLFSLGLANILE</td> <td>...</td> <td>LQQICTYKLDYNRVVRDLDFHFSVLERIKRSKEVVDELSQTEERRKREER...</td> </tr> <tr> <td><i>Solanum tuberosum</i></td> <td>...</td> <td>KDGFYSRLFAVGLFRLLE</td> <td>...</td> <td>LEKLCAALNVNKKSVDRDLVDYRNLLSKLVQAKELLKEYVEREKKKRGER...</td> </tr> <tr> <td><i>Triticum aestivum</i></td> <td>...</td> <td>KGNFSYSRFFAVGLFRLLE</td> <td>...</td> <td>LDKLCAALNINKKSVDRDLVDYRNLLSKLVQAKELLKEYVEREKKKREER...</td> </tr> <tr> <td><i>Oryza sativa</i> (japonica)</td> <td>...</td> <td>KGSFSYSRFFAVGLFRLLE</td> <td>...</td> <td>LDKLCAALNINKKSVDRDLVDYRNLLSKLVQAKELLKEYVEREKKKREER...</td> </tr> <tr> <td><i>Chlamydomonas reinhardtii</i></td> <td>...</td> <td>AGAFSYNKFVAIGLFRLLE</td> <td>...</td> <td>LEKLVKAVGVKPEAVNRDLMYKGVLSKLAALKELMRFVEREKKKQAEER...</td> </tr> <tr> <td><i>Arabidopsis thaliana</i></td> <td>...</td> <td>KEGFSYSRFFAVGLFRLLE</td> <td>...</td> <td>LDKLCASLNINKKSVDRDLVDYRNLLSKLVQAKELLKEYVEREKKKQGER...</td> </tr> <tr> <td><i>Chlorella virus</i> PBCV-1</td> <td>...</td> <td>NDKYVYSSFAAVGIFKLLQ</td> <td>...</td> <td>VKHLSESIGFKGBLVHKDIATFFSLLKYIESSQKLADDIREESLKRKSKS...</td> </tr> </table>					135	153	170	219	<i>Synechocystis</i> PCC 6803	...	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WU-BLAST was used to identify proteins homologous to Psb29. The proteins identified in the analysis all had E-values 10^{-14}. Protein sequences were aligned using CLUSTAL-W, followed by manual alignment. Three well conserved blocks were identified and used for tree building, consisting of a total of 165 columns. Columns are numbered according to the *Synechocystis* 6803 protein sequence.