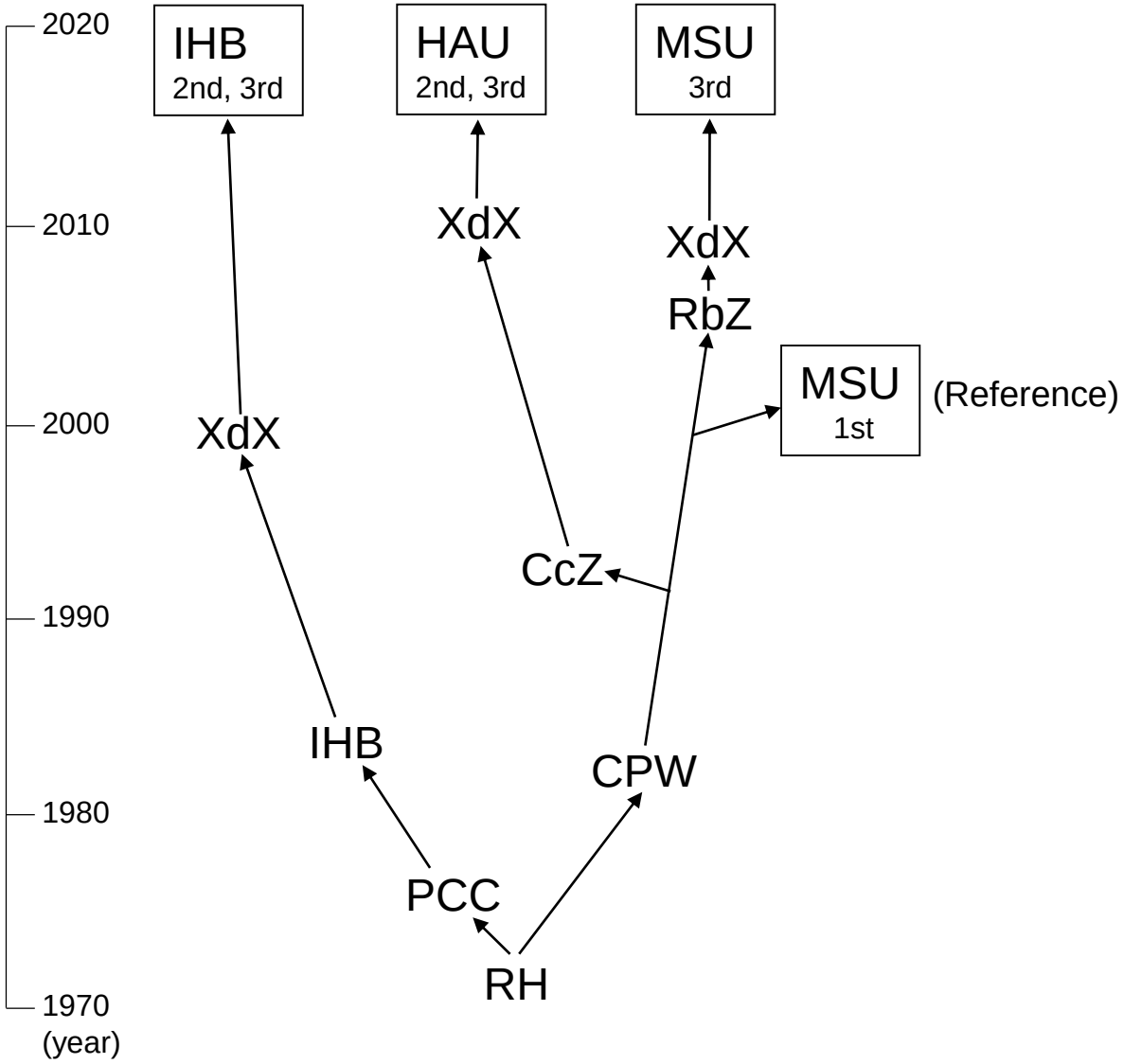

FIG S1 A brief history of *Anabaena* 7120 substrains used in this study. CPW, C. Peter Wolk; CcZ, Chengcai Zhang; HAU, Huazhong Agriculture University; IHB, Institute of Hydrobiology; MSU, Michigan State University; RH, Robert Haselkorn; RbZ, Ruanbao Zhou; XuX, Xudong Xu. 1st, 2nd and 3rd stand for different generation sequencing data.

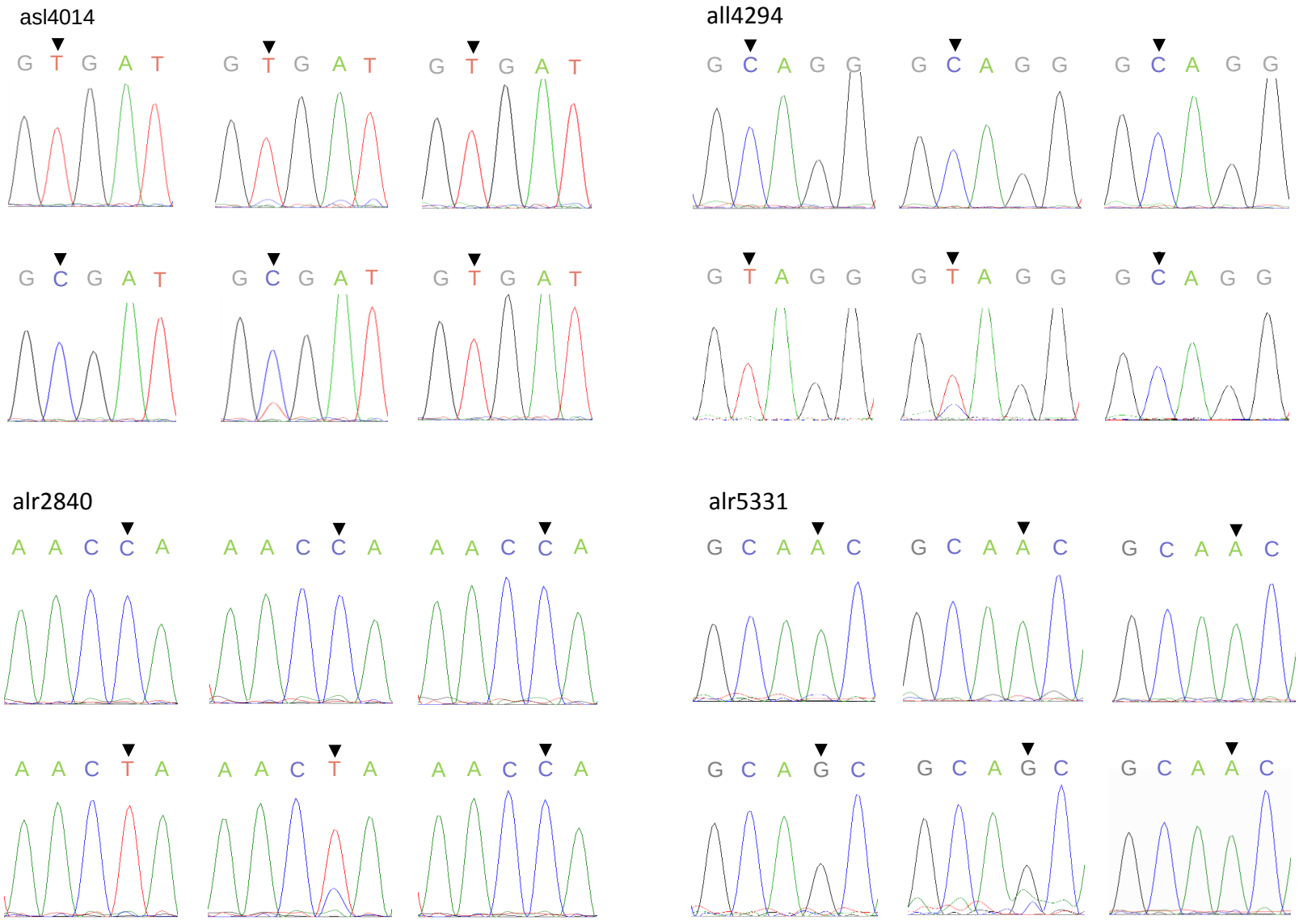

FIG S2 Ongoing substitutions in *Anabaena* PCC 7120 IHB. Filaments of the substrain were plated after sonication and dilution, 6 colonies were randomly picked and cultured. PCR products were generated with DNA of the 6 colonies and sequenced. Arrowheads point to bases being substituted in the population.

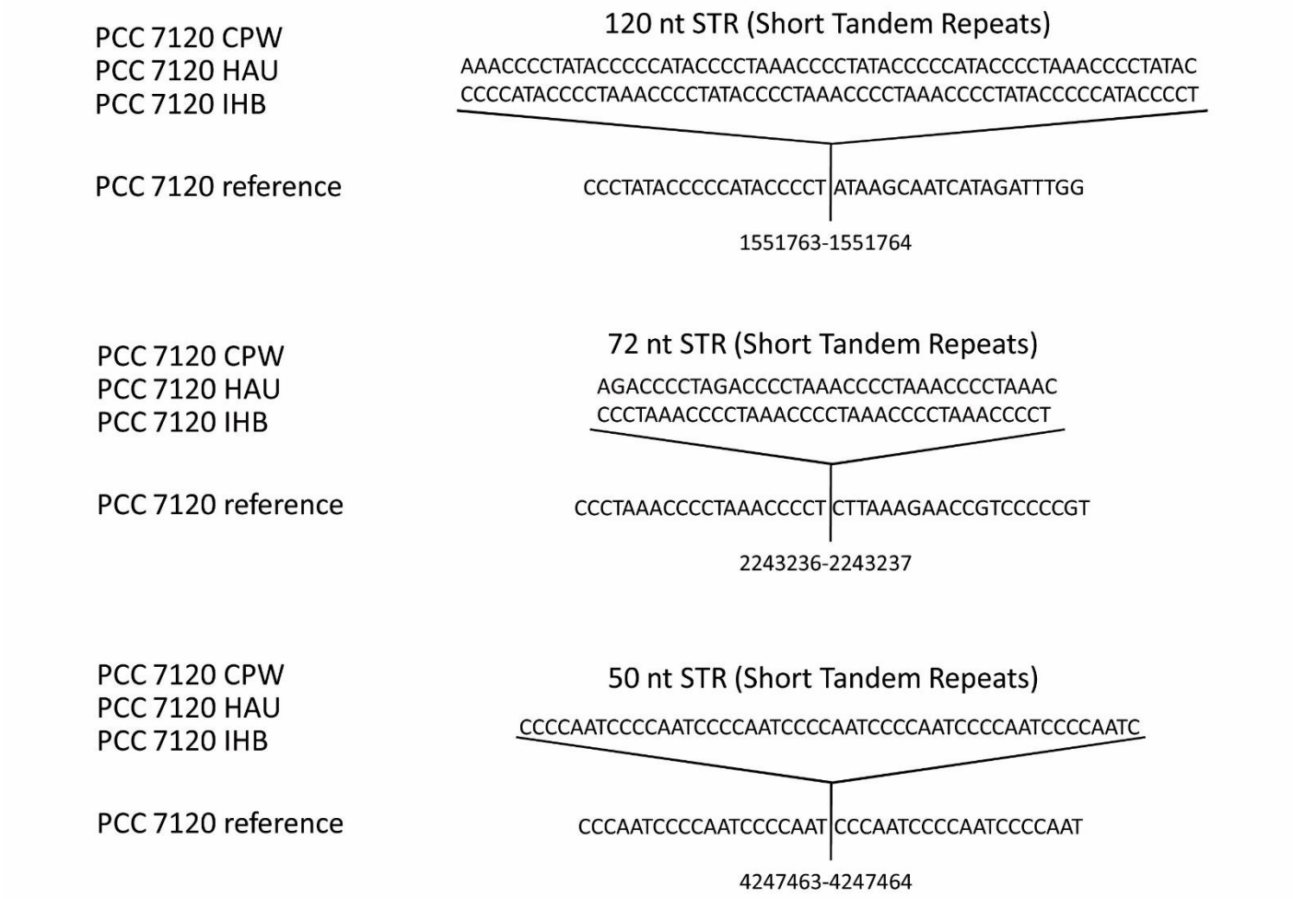

FIG S3 Three short sequence stretches that are missing in the PCC 7120 reference sequence in the Cyanobase.

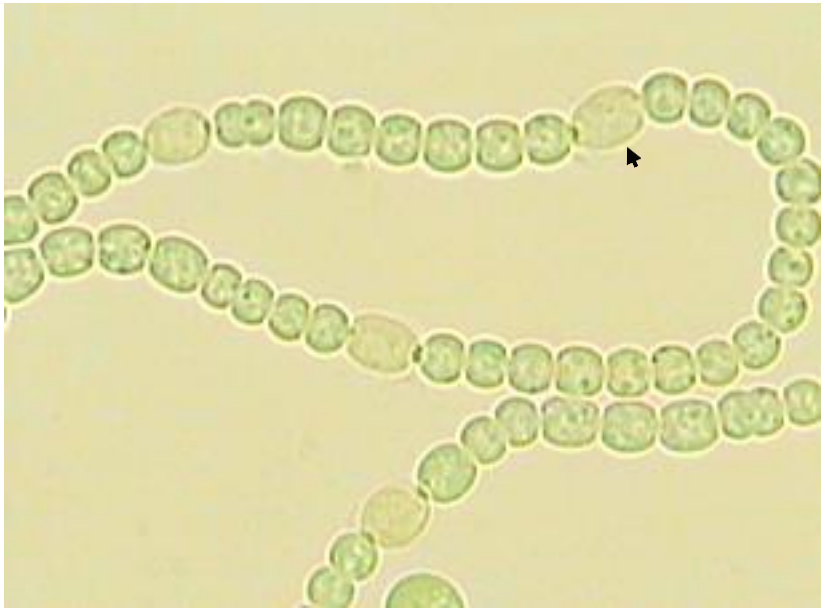

FIG S4 Complementation of *Anabaena* 7120-MSU *hetC*::C.CE2 with pHB3589 that carries *hetC*. The photomicrograph was taken at 24 h after N-stepdown. The arrowhead points to a heterocyst.

FIG S5 Proposed sequence of the extra IS(*all7245*, *asl7246*) at the alpha plasmid position 165178 in HAU and IHB (Fig. 2B). The short highlighted sequence (yellow) at the 3′ end is not found at the end of the copy at alpha plasmid position 45585 in IHB (Fig. 2B) and the end of the copy at alpha 267900-266184 in HAU, IHB and MSU [where *all7245* and *asl7246* are located; not shown in Fig. 2B]. Start and stop codons for *all7245* and *asl7246* are indicated in red and boxed.

(5′ > 3′)

TTTCTGCAAGCCGCACACTCGTGACTTCTAGTCATGAGTTAGGCGCTCCATATTTCCATA
TTTTGTCTTACTATGGTCATGCACATGGTAAGATGAATTATGGAAGTAAAGCACGGTAG
AGGTTACGTTTATGCAATTGAGTATCATATCGTATGGTGTGTTAAGTATAGGCATAAGGT
ACTGAAAGATGAAATAGCTGACTTTCTGAAAGAAGTTCTAGTTGAGACGGCAATTCTT
TACAAATTCAAGGTTGAGAGTCTTGAGGTAGTAGAAGACCATGTTCATGTTTTAGTGTC
TGCAACGCCTCAGCACACCATCCCTAATATAGTCAAAATGCTAAAGGGAATATCAGCTA
GGAAATTGTTTTTAAAGTTTCCTCAACTCAAGAAAAAGCTATGGGGAGGTCATCTCTG
GAATCCTAGTTATTTTGTAAGTACTGTTTCAGATAATACAGAAGCACAAGTCAAAAAGT
ACATAGAAAACCAAAATGCAGAGAGCGTTTAAAGTTACACTCATTCCTAATCACAATC
AAGAGGTCTTAATCAATAAGAGTATTGGTTGTGCAAGGTTTGTGTATAACCACTTTCTG
GCATTAAAGCAAGAGCTATATCAGTCCGAACAGAAAACATTAAACTATAACGCTTGTAG
TCAACGTTTAACTTTACTCAAGAAAGAAATTGAATGGTTGAAGGAAGTAGATAAGTTT
GCCTTACAGAATTCGCTCAAGAATTTAGAGACAGCATACAAAAACTTTTTTGCTGACTT
AAAGAAGGTCAAAGGCAAAAAAGGAGTAGGCTTTCCCAAGTTTAAAAAGAAGCATGG
TTGCAAGCAGTCTTACAAGACGAATTTAACAAACGGTAACATCCAGGTAATAGAGAAT
CGTTTAAAGCTTCCGAAGTTAGGGTGGGTGAAGTTTCATAAGTCCCAAGAAGTTACCG
GAAAGCTTATAAACGTTACCATAACTCGGACTTCTTCTGGTAAATATGTTGCTAGTATTC
TGTGTGATACAGAGATTGAGAAACATCCCCAAGTTAGTCAAAATATTGGCATAGACTTA
GGCATAAAGTCTTATCTCGTTACTAGTAATGGGGAAGTCGTAGATAATCCCAAATATTAC
CGGACTCAAACTCGTAAATTACGTAAAGCACATAAAAAATTATCCCGCAGTGTAAAAG
GCAGTACTAATCGAGTCAAAGCGAAAATCAAGCTGGCTCGTAGCTACGAAAGAATTAC
CAATCTCAGAGATGACTTTCTGCACAAGCTGTCAACTCGTCTAATCAAAGAAAACAGT

ATTATCTGTATTGAGGATTTGCGAGTTGCCAACATGGTAAAAAACCATAAATTATCATTG

AGTATTTCAGACGCTAGTTGGTCTAAGTTCGTTGCCATGCTTGAATATAAAGCTTTTTGG

CATGACAGAATTGTGCAGAAGGTTGGTACGTTTTATCCCTCCTCTCAGACTTGTAATCA

TTGTGGTTTTATCAACCCTTTGGTCAAAGATTTAAAGTTACGTGAATGGGCTTGTCCTG

GTTGTAGTGGTTACAATTTGAGAGACAATAACGCAGCGTTGAACATATTAGGTGAGGGA

TTGAGATTAATAGCCGCCGTGGGTATCCCGGAGGCTCTAAACGCCTGTGGAGAACTCG

TCAGTCCTGGAGCAATTCAGGCAGAGATCGTTGAAGCAGGAATCACGCGACTTCAAGT

CGTGTGAGGTTCAAGATAGAATCAGCTAAATCTTGA

Table S1 Chromosomal SNPs in *Anabaena* sp. PCC 7120 substrains IHB and HAU*

Position	Ref. base	IHB		HAU		Gene	Region
		base	depth	base	depth		
99793	C	C	\	T	439	*alr0094*	ORF
136013	T	T	\	C	383	*alr0132*, *all0131*	Intergenic
141747	A	A	\	G	414	*asl0137*, *all0138*	Intergenic
165432	A	A	\	G	427	*all0160*	ORF
172755	T	T	\	C	295	*all0167*	ORF
176465	G	A	414	G	\	*all0168*	ORF
228394	T	C	398	C	375	*all0211*	ORF
240374	A	G	439	G	449	*alr0223*	ORF
254220	A	G	309	A	\	*alr0236*, *alr0237*	Intergenic
335391	T	T	\	C	383	*alr0295*, *all0293*	Intergenic
367421	A	G	498	A	\	*all0323*	ORF
388027	C	T	474	C	\	*alr0336*	ORF
411083	A	G	491	G	473	*all0355*	ORF
461600	A	A	\	G	430	*all0394*	ORF
635525	A	A	\	G	467	*alr0543*, *all0542*	Intergenic
663464	A	G	522	G	345	*alr0568*	ORF
676298	G	G	\	T	337	*asr0581*, *alr0582*	Intergenic
703818	C	C	\	T	393	*all0606*	ORF
791750	T	C	478	T	\	*all0684*	ORF
804565	A	G	504	A	\	*asr0697*	ORF
838235	G	G	\	A	371	*alr0719*	ORF
850685	T	T	\	C	421	*all0729*	ORF
873358	T	C	568	T	\	*alr0751*, *alr0752*	Intergenic
964001	G	G	\	A	427	*alr0838*	ORF
965275	T	C	461	C	454	*alr0840*, *all0839*	Intergenic
1105390	C	T	524	C	\	*alr0950*, *alr0951*	Intergenic

1164680	C	C	\	T	299	*all0993*	ORF
1181589	T	C	441	C	389	*all1011*	ORF
1197843	T	C	477	C	404	*all1027*	ORF
1213151	T	T	\	C	43	*alr1042*, *alr1041*	Intergenic
1218823	C	T/C	355/89	C	\	*all1047*	ORF
1233544	G	G	\	A	462	*all1058*	ORF
1234860	A	G	472	A	\	*all1059*	ORF
1260414	A	G	480	G	416	*all1076*	ORF
1276768	A	G	535	G	474	*all1089*	ORF
1291183	A	G	409	G	421	*all1101*	ORF
1297308	C	C	\	T	439	*alr1108*	ORF
1297479	A	G	431	G	373	*alr1108*	ORF
1313571	T	T	\	C	416	*alr1121*	ORF
1326135	C	T	468	C	\	*alr1128*	ORF
1384940	G	G	\	A	414	*all1177*	ORF
1425785	T	T	\	C	418	*all1210*	ORF
1449194	A	G	462	G	432	*all1227*	ORF
1467026	T	C	548	C	446	*alr1236*	ORF
1469539	T	T	\	C	491	*all1237*, *alr1238*	Intergenic
1473304	A	G	449	A	\	*alr1240*	ORF
1503377	A	G	532	G	389	*alr1266*	ORF
1511804	G	G	\	A	425	*all1272*	ORF
1524963	G	A	497	A	407	*all1281*	ORF
1526058	T	C	479	C	436	*alr1282*	ORF
1589551	G	G	\	A	392	*all1338*	ORF
1603350	G	A	378	A	429	*alr1348*	ORF
1611061	A	G	492	A	\	*all1357*	ORF
1611129	A	G	480	A	\	*all1357*	ORF
1689791	A	G/A	446/93	A	\	*all1427*	ORF

1720294	G	G	\	A	379	*all1463*, *alr1462*	Intergenic
1740294	G	A	405	G	\	*all1477*	ORF
1740843	T	C	455	C	401	*all1478*	ORF
1771480	A	A	\	C	412	*all1509*	ORF
1810252	T	T	\	C	443	*all1549*	ORF
1816020	T	C	433	T	\	*all1553*	ORF
1829742	G	T	515	G	\	*alr1564*	ORF
1839174	C	T	447	T	386	*all1574*, *alr1575*	Intergenic
1895931	G	A	468	A	386	*alr1614*	ORF
1897575	G	A	500	A	379	*alr1614*	ORF
1907745	A	A	\	G	370	*alr1619*	ORF
1908542	T	C	460	T	\	*alr1620*	ORF
1939174	C	T	488	C	\	*all1639*	ORF
1968465	T	T	\	C	342	*all1649*	ORF
1981387	G	A	473	A	464	*alr1659*	ORF
1992410	A	A	\	G	389	*alr1669*	ORF
2008739	G	A	480	A	432	*all1683*	ORF
2020785	G	A	528	A	499	*all1691*, *all1692*	Intergenic
2027656	G	A	500	G	\	*all1695*	ORF
2028469	C	T	486	C	\	*all1695*	ORF
2095482	A	G	474	A	\	*alr1742*	ORF
2103674	A	A	\	G	446	*asl1749*	ORF
2199111	T	T	\	C	455	*alr1833*, *alr1834*	Intergenic
2203380	C	T	488	T	456	*asl1839*	ORF
2212421	C	C	\	T	389	*all1849*	ORF
2232920	C	T	465	C	\	*alr1870*	ORF
2310473	A	G	240	A	\	*alr1926*, *alr1927*	Intergenic
2348508	A	T	433	A	\	*alr1965*, *alr1966*	Intergenic
2359208	T	C	420	C	410	*all1974*	ORF

2386615	G	G	\	A	421	*all1990*	ORF
2466963	C	T	458	T	360	*all2058*	ORF
2479725	T	G	460	G	440	*alr2073*, *all2072*	Intergenic
2498543	C	C	\	A	244	*alr2090*	ORF
2498548	T	T	\	C	248	*alr2090*	ORF
2556356	T	T	\	C	463	*alr2130*	ORF
2571912	A	A	\	G	429	*alr2143*	ORF
2580643	G	G	\	A	385	*all2149*	ORF
2665829	T	C	523	C	407	*all2221*, *all2222*	Intergenic
2677570	G	A	534	G	\	*alr2233*	ORF
2756402	A	G	462	G	355	*all2287*	ORF
2832449	G	G	\	A	401	*alr2350*, *all2349*	Intergenic
2834963	A	A	\	G	435	*all2352*	ORF
2843120	C	T	465	C	\	*alr2361*	ORF
2856383	T	C	462	C	358	*alr2373*	ORF
2871033	C	C	\	T	430	*all2384*	ORF
2902538	G	G	\	A	431	*alr2418*	ORF
2927969	T	T	\	C	395	*alr2434*	ORF
2966029	C	C	\	T	428	*alr2467*	ORF
2979695	A	A	\	G	436	*alr2481*	ORF
3067783	A	G/A	370/93	A	\	*all2567*	ORF
3150434	G	A	477	A	439	*all2635*	ORF
3164466	T	C	414	C	426	*all2643*	ORF
3214501	A	G	545	G	464	*all2655*	ORF
3244445	A	G	406	G	424	*all2675*, *all2676*	Intergenic
3280388	A	G	447	G	404	*all2688*	ORF
3280989	A	A	\	G	422	*all2689*	ORF
3292733	A	A	\	G	408	*all2699*	ORF
3299861	A	G	436	G	366	*all2706*	ORF

3314107	C	T	494	T	434	*alr2719*, *alr2718*	Intergenic
3321812	C	T	448	T	407	*alr2725*	ORF
3376560	T	C	510	C	455	*asl2779*, *alr2780*	Intergenic
3384352	A	G	485	G	411	*alr2784*, *alr2785*	Intergenic
3385448	C	T	491	T	374	*alr2785*	ORF
3388341	T	A	329	A	356	*all2787*	ORF
3404883	C	T	469	T	435	*alr2800*	ORF
3439866	T	C	479	C	445	*alr2824*	ORF
3449008	C	C	\	T	403	*alr2832* (glycosyltransferase)	ORF
3461181	G	G	\	A	433	*alr2840* (glycosyltransferase)	ORF
3461281	T	C/T	413/103	T	\	*alr2840*	ORF
3522353	C	T	487	T	314	*alr2884*, *all2883*	Intergenic
3529532	A	G	444	G	337	*all2891*	ORF
3553554	T	T	\	C	392	*all2911*	ORF
3561805	T	T	\	C	437	*alr2920*, *alr2921*	Intergenic
3665879	T	C	439	C	337	*asl3025*	ORF
3678170	A	G	444	A	\	*alr3037*	ORF
3678824	A	G	466	G	436	*alr3037*	ORF
3682278	C	T	407	T	439	*all3040*, *all3041*	Intergenic
3707449	A	G	424	A	\	*alr3059*	ORF
3717999	T	T	\	C	407	*alr3068*	ORF
3902869	T	C	476	T	\	*all3232*	ORF
3997485	T	C/T	387/50	T	\	*alr3311*	ORF
4004306	C	T	434	C	\	*all3314*	ORF
4054871	T	T	\	C	442	*alr3351*	ORF
4070477	G	G	\	A	340	*alr3363*	ORF
4071943	T	T	\	C	397	*alr3364*	ORF

4074557	C	T	455	T	320	*alr3366*, *all3367*	Intergenic
4085038	C	T	449	T	463	*all3375*	ORF
4096661	T	C	469	C	375	*alr3385*	ORF
4105348	A	A	\	G	366	*alr3397*	ORF
4206630	T	T	\	C	416	*alr3491*	ORF
4211631	G	A	490	A	365	*alr3497*	ORF
4219140	A	G	486	A	\	*all3503*	ORF
4283858	A	G	453	A	\	*alr3553*, *alr3554*	Intergenic
4329437	G	A	479	A	431	*alr3584*	ORF
4372460	A	C	71	C	472	*alr3620*	ORF
4383161	C	T/C	517/59	C	\	*all3632*	ORF
4429266	A	G	294	A	\	*alr3672*, *all3673*	Intergenic
4524010	G	G	\	A	455	*all3746*	ORF
4542759	A	A	\	G	388	*alr3761*	ORF
4580258	C	T	452	C	\	*alr3789*	ORF
4591842	G	A	500	G	\	*alr3799*, *alr3800*	Intergenic
4609347	G	A	409	G	\	*alr3811*, *alr3812*	Intergenic
4624534	A	A	\	G	395	*alr3825*	ORF
4633553	G	A	460	A	417	*alr3832*, *alr3833*	Intergenic
4658414	G	A	515	G	\	*all3859*	ORF
4667926	A	A	\	G	460	*alr3867*	ORF
4692046	G	A	455	G	\	*all3891*	ORF
4707809	A	G	522	A	\	*all3903*, *alr3904*	Intergenic
4708391	A	A	\	G	426	*alr3904*	ORF
4741099	G	A	484	A	387	*all3927*	ORF
4834014	G	A/G	437/131	G	\	*asl4014*	ORF
4835685	C	T	490	C	\	*alr4016*	ORF
4853972	T	C	480	C	418	*alr4028*	ORF
4862032	C	T	488	T	430	*all4035*	ORF

4930827	T	T	\	C	470	*all4092*	ORF
4942838	C	C	\	T	396	*all4102*	ORF
4960654	T	T	\	C	418	*all4117*	ORF
4987803	T	C	453	T	\	*alr4141*, *all4142*	Intergenic
5012714	C	T	526	T	473	*alr4166*	ORF
5031775	C	C	\	T	389	*all4182*	ORF
5036789	T	C	478	C	420	*all4188*	ORF
5053532	T	T	\	C	432	*alr4216*	ORF
5054846	C	A	488	C	\	*all4218*	ORF
5069810	T	C	417	C	434	*all4233*	ORF
5072713	A	G	513	G	361	*all4236*	ORF
5093978	T	T	\	C	397	*alr4247*	ORF
5096718	A	G	452	G	378	*all4248*	ORF
5118388	T	C	494	C	486	*alr4268*	ORF
5123906	T	C	487	T	\	*alr4273*	ORF
5128378	T	C	473	C	467	*alr4275*	ORF
5130579	T	T	\	C	355	*alr4277*	ORF
5148689	A	G/A	376/85	A	\	*all4294*	ORF
5220452	C	T	484	C	\	*all4358*	ORF
5268442	G	A	461	G	\	*alr4394*	ORF
5277885	C	T	511	C	\	*all4402*	ORF
5295867	G	T	489	G	\	*alr4417*	ORF
5299799	G	A	541	A	397	*asr4421*	ORF
5366378	A	C	466	A	\	*all4480*	ORF
5376257	T	C	532	T	\	*alr4489*	ORF
5451412	A	A	\	G	457	*all4556*	ORF
5472869	A	G	174	A	\	*all4578*	ORF
5472870	A	C	174	A	\	*all4578*	ORF
5501951	A	G	458	G	450	*alr4604*	ORF

5542778	A	G	462	G	423	*all4639*	ORF
5596861	C	T	482	T	462	*all4690*	ORF
5636415	T	T	\	C	344	*all4729*	ORF
5638397	A	G	465	G	391	*all4731*	ORF
5646409	A	G	464	G	437	*alr4734*, *all4735*	Intergenic
5656553	A	G	493	G	461	*asl4743*	ORF
5677447	G	G	\	T	469	*all4763*	ORF
5718687	A	G	427	G	387	*all4799*	ORF
5730046	C	T	487	T	442	*alr4811*, *alr4812* (heterocyst differentiation related protein PatN)	Intergenic
5746803	C	C	\	T	420	*all4828*	ORF
5808428	A	G	470	G	437	*alr4877*	ORF
5873706	C	A	526	C	\	*all4925*	ORF
5895688	C	T	484	C	\	*alr4938*, *alr4939*	Intergenic
5930524	C	C	\	T	399	*all4968*	ORF
6040371	T	T	\	C	353	*alr5068*	ORF
6053276	G	G	\	A	398	*all5082*, *alr5081*	Intergenic
6053727	T	T	\	C	381	*all5082*, *alr5081*	Intergenic
6077149	C	T	509	C	\	*all5100*, *alr5101*	Intergenic
6078691	T	T	\	C	406	*alr5101*	ORF
6085980	G	A	491	G	\	*all5105*	ORF
6087384	G	T	443	G	\	*all5106*	ORF
6103380	G	G	\	A	435	*all5113*	ORF
6150516	C	T	478	C	\	*all5153*	ORF
6239409	G	A	531	G	\	*alr5225*	ORF
6263798	T	C	438	C	423	*alr5249*	ORF
6275081	G	G	\	A	377	*alr5259*	ORF

6276832	G	A	527	A	367	*asr5261*	ORF
6352567	C	T/C	441/61	C	\	*all5323*	ORF
6365449	G	A/G	426/92	G	\	*alr5331*	ORF
6375751	C	T	465	C	\	*all5342*	ORF
6386500	T	T	\	C	448	*alr5351* (heterocyst glycolipid synthase)	ORF
6387506	A	G	482	G	481	*alr5351*	ORF

*Bases boxed were confirmed with PCR and traditional sequencing.

Table S2 InDels in chromosome (chr) and plasmids of *Anabaena* sp. PCC 7120 substrains IHB and HAU*

Chr or plasmid	Position	Type	Ref.	IHB		HAU		Gene	Region
			base	base	depth	base	depth		
chr	14661	Deletion	A	A	\	-	1784	*alr0018*	ORF
chr	36912-3	Insertion	-	-	\	A	461	*alr0035*, *all0036*	Intergenic
chr	207447	Deletion	T	T	\	-	1731	*alr0191*, *all0192*	Intergenic
chr	414839-40	Insertion	-	A	599	A	1999	*alr0357*	ORF
chr	554951-2	Insertion	-	T	459	-	\	*all0466*	ORF
chr	589912-3	Insertion	-	-	\	T	1166	*all0493*	ORF
chr	610519	Deletion	T	-	384	-	1246	*trnH-GUG*, *alr0518*	Intergenic
chr	771861	Deletion	T	-	541	-	1664	*all0665*, *all0665*	ORF
chr	809568-9	Insertion	-	-	\	A	1572	*all0703*, *alr0704*	Intergenic
chr	902956-7	Insertion	-	T	485	-	\	*asl0779*	ORF
chr	940479	Deletion	T	-	526	-	1451	*asl0814*	ORF
chr	972329	Deletion	T	-	462	T	\	*all0848*	ORF
chr	1058848-9	Insertion	-	-	\	T	2052	*all0914*	ORF
chr	1115022	Deletion	T	T	\	-	2060	*all0959*	ORF
chr	1333941-2	Insertion	-	-	\	GAA	1170	*alr1133*	ORF
chr	1393819-20	Insertion	-	-	\	T	1457	*alr1184*	ORF
chr	1545050	Deletion	C	C	\	-	1217	*all1304*	ORF
chr	1843512	Deletion	A	-	601	A	\	*alr1575*, *alr1576*	Intergenic
chr	1939746-7	Insertion	-	T	507	-	\	*all1640*	ORF
chr	1951712-3	Insertion	-	T	536	T	1185	*all1646*	ORF
chr	1993136	Deletion	A	-	575	A	\	*all1670*, *asl1671*	Intergenic
chr	2086016-7	Insertion	-	A	475	-	\	*alr1733*, *asr1734*	Intergenic
chr	2124780	Deletion	T	T	\	-	2006	*all1769*	ORF
chr	2271317-8	Insertion	-	T	471	-	\	*alr1901*	ORF

chr	2326295-6	Insertion	-	A	498	A	1004	*alr1942*, *alr1942*	ORF
chr	2640110	Deletion	T	-	281	-	2197	*asl2199*, *all2200*	Intergenic
chr	2685079	Deletion	T	T	\	-	1839	*all2237*	ORF
chr	2720514	Deletion	T	T	\	-	1667	*all2260*, *alr2261*	Intergenic
chr	2724275-6	Insertion	-	-	\	T	1655	*alr2264*	ORF
chr	2787260	Deletion	A	-	447	-	1356	*alr2312*	ORF
chr	2836658	Deletion	C	-	546	C	\	*asl2353*, *asl2354*	Intergenic
chr	2848795-6	Insertion	-	-	\	G	1098	*all2364*	ORF
chr	2852744-5	Insertion	-	-	\	A	1827	*asr2369*	ORF
chr	3131501	Deletion	T	-	559	-	1919	*all2622*, *all2623*	Intergenic
chr	3145914	Deletion	A	A	\	-	1853	*asl2632*	ORF
chr	3205733-4	Insertion	-	-	\	A	1455	*all2651*, *all2652*	Intergenic
chr	3293129-30	Insertion	-	A	564	-	\	*all2699*, *all2700*	Intergenic
chr	3487835-6	Insertion	-	A	487	A	1710	*alr2862*	ORF
chr	3517885	Insertion	-	G	232	-	\	*alr2882*, *all2883*	Intergenic
chr	3594745	Deletion	T	T	\	-	1435	*all2952*	ORF
chr	3810307	Deletion	G	-	447	-	1052	*alr3146*	ORF
chr	3909868	Deletion	A	-	547	A	\	*all3237*, *alr3238*	Intergenic
chr	3925317-8	Insertion	-	A	556	A	1413	*alr3248*	ORF
chr	3942866	Deletion	T	T	\	-	1696	*all3270*, *all3271*	Intergenic
chr	3990028-9	Insertion	-	T	500	T	1511	*all3306*, *alr3307*	Intergenic
chr	4070842-3	Insertion	-	G	545	G	1782	*alr3363*, *alr3364*	Intergenic
chr	4203130	Deletion	T	-	497	T	\	*all3487*, *all3488*	Intergenic
chr	4247463-4	Insertion	-	-	\	C	48	*alr3525*	ORF
chr	4336583-4	Insertion	-	A	483	-	\	*alr3588*	ORF
chr	4723840	Deletion	GA	-	521	GA	\	*alr3917*	ORF
chr	4776489	Deletion	T	-	443	-	1305	*alr3956*, *alr3957*	Intergenic
chr	5022643	Deletion	A	A	\	-	1295	*alr4174*	ORF
chr	5063682	Deletion	AG	AG	\	-	2154	*alr4226*	ORF

chr	5087164	Deletion	A	A	\	-	1573	*all4242*	ORF
chr	5106430-1	Insertion	-	G	459	-	\	*all4257*	ORF
chr	5146433	Deletion	T	-	460	-	1817	*all4292*	ORF
chr	5651270-1	Insertion	-	A	535	A	1842	*alr4739*	ORF
chr	5746722-3	Insertion	-	G	503	G	1760	*all4828*	ORF
chr	5808188-9	Insertion	-	-	\	A	1811	*alr4877*	ORF
chr	5945191-2	Insertion	-	-	\	A	39	*rrn23Sd*	rrn23Sd
chr	5989467	Deletion	T	-	537	-	1558	*all5017*	ORF
chr	6035648	Deletion	A	-	474	-	1500	*all5062*, *all5063*	Intergenic
chr	6098981	Deletion	C	C	\	-	1154	*all5111*	ORF
chr	6130243	Deletion	T	-	513	-	1942	*all5133*, *alr5134*	Intergenic
chr	6390098-9	Insertion	-	A	400	-	\	*alr5351*	ORF
alpha	29215-6	Insertion	-	C	1958	-	\	*all7030*	ORF
alpha	62179-80	Insertion	-	-	\	TT	8035	*all7072*, *alr7073*	Intergenic
alpha	132994	Deletion	A	A	\	-	9566	*all7130*	ORF
alpha	160054	Deletion	C	-	577	C	\	*all7158*, *asl7159*	Intergenic
alpha	160612-3	Insertion	-	-	\	C	6095	*all7160*	ORF
alpha	272804-5	Insertion	-	A	2169	-	\	*alr7254*, *all7255*	Intergenic
alpha	303864	Deletion	A	-	2312	A	\	*alr7295*, *asl7296*	Intergenic
alpha	365507	Deletion	A	A	\	-	7279	*all7332*	ORF
alpha	386284-5	Insertion	-	T	2466	T	9286	*asl7356*	ORF
alpha	392645	Deletion	T	-	2335	-	6603	*all7367*	ORF
alpha	398598-9	Insertion	-	-	\	T	4243	*all7376*, *all7377*	Intergenic
alpha	402532	Deletion	A	A	\	-	7873	*all7379*	ORF
beta	58391	Deletion	G	-	542	G	\	*all7564*	ORF
gamma	72469-70	Insertion	-	-	\	C	355	*all8065*, *alr8066*	Intergenic
delta	9538	Deletion	T	-	520	-	684	*all8511*, *asl8512*	Intergenic
delta	27841	Deletion	A	-	416	-	698	*asl8536*	ORF

*Bases boxed were confirmed with PCR and traditional sequencing.