

S5 Fig. Multiple sequence alignment of CheA-P1 sequences from the non-redundant *Enterobacteriales* genome set. Each sequence tag contains the first two letters of the genus, the first three letters of the species and the organism id in the MIST database, followed by the locus and accession number. The tag also includes the chemotaxis class for CheA (e.g. F7) and shows the presence (1CheV) or absence (0CheV) of *cheV* genes in a corresponding genome.

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Pr.stu.1965-S70_18125-YP_006218122.1-F7-0CheV-1    FYQTFDEADELLRDMEQHLLLELDPDPDSEQLNAIFRSAHSIKGGAATFGFTLQNTTH
Ph.lum.1262-plu1851-NP_929124.1-F7-0CheV-1        --QTFDEADELLEDMEQHLLQLDPDAPDQEQNLNAIFRSAHSIKGGAATFGFKLQQTTH
Ph.asy.1114-PAU_02687-YP_003041521.1-F7-0CheV-1  --QTFDEADELLEDMEQHLLQLDPNAPDQEQNLNAIFRSAHSIKGGAATFGFKLQQTTH
Ed.tar.1771-ETAF_1247-YP_005698853.1-F7-0CheV-1  --QTFDEADELLEDMEQHLLALDPQEPDNEQLNAIFRAAHSIKGGAATFGFTVLQETTH
Cr.sak.579-ESA_01341-YP_001437437.1-F7-1CheV-1   -YQTFDEADELLADMEQHLLDLVPEAPDAEQNLNAIFRAAHSIKGGAGTFGFTLQETTH
En.asb.1498-Entas_2599-YP_004829113.1-F7-1CheV-1 -YQTFDEADELLADMEQHLLDLVPEAPDSEQLNAIFRAAHSIKGGAGTFGFTLQETTH
Cr.tur.6-CTU_25850-YP_003210948.1-F7-1CheV-1    -YQTFDEADELLADMEQHLLDLVPEAPDAEQNLNAIFRAAHSIKGGAGTFGFTLQETTH
Es.fer.1173-EFER_1133-YP_002382295.1-F7-1CheV-1 -YQTFDEADELLADMEQHLLDLQPAAPDAEQNLNAIFRAAHSIKGGAGTFGFTLQETTH
En.638.865-Ent638_2466-YP_001177186.1-F7-1CheV-1 -YQTFDEADELLADMEQHLLNLVPEAPDSEQLNAIFRAAHSIKGGAGTFGFTLQETTH
Sa.bon.1474-SBG_1757-YP_004730611.1-F7-1CheV-1  -YQTFDEADELLADMEQHLLDLVPEAPDSEQLNAIFRAAHSIKGGAGTFGFTLQETTH
Ed.ict.1187-NT01EI_1458-YP_002932879.2-F7-0CheV-1 --QTFDEADELLADMEQHLLALDPQEPDNEQLNAIFRAAHSIKGGAATFGFTVLQETTH
Di.zea.1140-Dd1591_1540-YP_003003873.1-F7-1CheV-1 --QTFDEADELLADMEQHLLQLDPLAPDAEQMNAIFRAAHSIKGGAGTFGFTVLQETTH
Sa.ent.407-STM1921-NP_460878.1-F7-1CheV-1        -YQTFDEADELLADMEQHLLDLVPEAPDAEQNLNAIFRAAHSIKGGAGTFGFTLQETTH
Sa.ent.404-STY2130-NP_456487.1-F7-1CheV-1        -YQTFDEADELLADMEQHLLDLVPEAPDAEQNLNAIFRAAHSIKGGAGTFGFTLQETTH
Ci.kos.578-CRO_01061-YP_001452640.1-F7-1CheV-1  -YQTFDEADELLADMEQHLLDLAPEAPDSEQLNAIFRAAHSIKGGAGTFGFTVLQETTH
Ci.rod.62-ROD_19411-YP_003365498.1-F7-1CheV-1   -YQTFDEADELLADMEQHLLDLAPEAPDAEQNLNAIFRAAHSIKGGAGTFGFTLQETTH
Pe.atr.485-ECA1689-YP_049790.1-F7-1CheV-1       --QTFDEADELLADMEQHLLLDPSEPDTEQLNAIFRAAHSIKGGAATFGFKALQETTH
En.clo.1544-EcWSU1_02820-YP_004952673.1-F7-1CheV-1 -YQTFDEADELLADMEQHLLDLVPEAPDSEQLNAIFRAAHSIKGGAGTFGFTLQETTH
Er.bill.197-Ebc_25380-YP_003741916.1-F7-1CheV-1 -YQTFDEADELLADMEQHLLGLDPQEPDSEQLNAIFRAAHSIKGGAGTFGFTVLQETTH
En.bac.2261-D782_1745-YP_007339926.1-F7-0CheV-1 -YQTFDEADELLADMEQHLLDLVPSDPDTEQMNNAIFRAAHSIKGGAGTFGFSVLQETTH
Es.col.1836-Y75_p1864-YP_490150.1-F7-0CheV-1    -YQTFDEADELLADMEQHLLVLQPEAPDAEQNLNAIFRAAHSIKGGAGTFGFSVLQETTH
Ye.pes.133-YP23_2033-YP_003568205.1-F7-0CheV-1 --QTFDEADELLADMEQHLLLDPLTDPNEQLNAIFRAAHSIKGGAATFGFTVLQETTH
Ye.pse.585-YPTB2405-YP_070919.1-F7-0CheV-1     --QTFDEADELLADMEQHLLLDPLTDPNEQLNAIFRAAHSIKGGAATFGFTVLQETTH
Mo.mor.2189-MU9_1760-YP_007505179.1-F7-0CheV-1 FYQTFDEADELLRDMEQHLLLELDPDPDSEQLNAIFRSAHSIKGGAATFGFTLQKQTH
Di.dad.235-Dda3937_02781-YP_003883642.1-F7-1CheV-1 --QTFDEADELLADMEQHLLQLDPLAPDTEQMNNAIFRAAHSIKGGAGTFGFKVLQETTH
Pa.vag.184-Pvag_1727-YP_003931364.1-F7-1CheV-1  -YQTFDEADELLADMEQHLLGLDPQEPDSEQLNAIFRAAHSIKGGAGTFGFTVLQETTH
Pr.mir.1265-PMI1668-YP_002151399.1-F7-0CheV-1   FYQTFDEADELLADMEQHLLLDLQNPDPQEQNLNAIFRSAHSIKGGAATFGFKLQQTTH
Pa.ana.1905-PAJ_1543-YP_005934419.1-F7-1CheV-1 -YQTFDEADELLADMEQHLLGLDPQEPDSEQLNAIFRAAHSIKGGAGTFGFTVLQETTH
Pantoe.297-Pat9b_1602-YP_004115475.1-F7-1CheV-1 -YQTFDEADELLADMEQHLLGLDPQEPDSEQLNAIFRAAHSIKGGAGTFGFTVLQETTH
Xe.nem.162-XNC1_1623-YP_003711884.1-F7-0CheV-1 --QTFDEADELLADMEQHLLLNADPSEQLNAIFRSAHSIKGGAATFGFTKLQQTTH
Er.tas.1011-ETA_14620-YP_001907401.1-F7-1CheV-1 -YQTFDEADELLADMEQHLLGLDPQEPDAEQNLNAIFRAAHSIKGGAGTFGFSVLQETTH
Pectob.2320-W5S_1766-YP_006282729.1-F7-1CheV-1 --QTFDEADELLADMEQHLLLDPSEPDTEQLNAIFRAAHSIKGGAGTFGFKVLQETTH
Se.mar.2260-D781_2761-YP_007345197.1-F7-0CheV-1 --QTFDEADELLADMEQHLLLDPLADPIEPLNAIFRAAHSIKGGAATFGFTLQETTH
Pe.car.1139-PC1_2611-YP_003018177.1-F7-1CheV-1 --QTFDEADELLADMEQHLLLDPSEPDTEQLNAIFRAAHSIKGGAGTFGFKVLQETTH
Ye.ent.378-YE2577-YP_001006780.1-F7-1CheV-1    --QTFDEADELLADMEQHLLLDPLAPDNEQLNAIFRAAHSIKGGAATFGFSVLQETTH
Se.pro.864-Spro_2985-YP_001479214.1-F7-0CheV-1 --QTFDEADELLADMEQHLLLELDPADPIEPLNAIFRAAHSIKGGAATFGFTVLQETTH
Xe.bov.105-XBJ1_1921-YP_003467825.1-F7-0CheV-1 --QTFDEADELLDDMEQHLLLDLADPDHEQLNAIFRSAHSIKGGAATFGFAKLQQTTH
En.aer.1436-EAE_15525-YP_004593295.1-F7-0CheV-1 --QTFDEADELLADMEQHLLLDLADPIEPLNAIFRAAHSIKGGAATFGFSVLQETTH
Se.ply.1407-SerAS9_3075-YP_004506455.1-F7-0CheV-1 --QTFDEADELLADMEQHLLLDLADPIEPLNAIFRAAHSIKGGAATFGFSVLQETTH
Serrat.1408-SerAS12_3076-YP_004501502.1-F7-0CheV-1 --QTFDEADELLADMEQHLLLDLADPIEPLNAIFRAAHSIKGGAATFGFSVLQETTH
Serrat.1901-SerAS13_3078-YP_006025917.1-F7-0CheV-1 --QTFDEADELLADMEQHLLLDLADPIEPLNAIFRAAHSIKGGAATFGFSVLQETTH
Ra.aqu.1678-Q7S_08670-YP_005401541.1-F7-1CheV-1 -YQTFDEADELLADMEQHLLLDLADPIEQLNAIFRAAHSIKGGAATFGFTVLQETTH
Rahnel.1320-Rahaq_1774-YP_004212519.1-F7-1CheV-1 -YQTFDEADELLADMEQHLLLDLADPIEQLNAIFRAAHSIKGGAATFGFTVLQETTH

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