

S6 Fig. Multiple sequence alignment of CheY and CheV-RR 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 CheV (e.g. F7) and shows the presence (1CheV) or absence (0CheV) of *cheV* genes in a corresponding genome.

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Pe.car.1139-PC1_2606-YP_003018172.1-CheY-1-1CheV      VVDDFSTMRRIVRNLLKELG-----FNNVEEAEDGDADLNKLRAGAFDFVISED
En.clo.1544-EcWSU1_02807-YP_004952660.1-CheY-1-1CheV  VVDDFSTMRRIVRNLLKELG-----FNNVEEAEDGDVADLNKLAGGFGFVISED
Pa.vag.184-Pvag_1720-YP_003931357.1-CheY-1-1CheV     VVDDFNTMRRIVRNLLKELG-----FNNVEEAEDGDVADLNKLAGGFGFVISED
Sa.bon.1474-SBG_1752-YP_004730606.1-CheY-1-1CheV     VVDDFSTMRRIVRNLLKELG-----FNNVEEAEDGDVADLNKLAGGFGFVISED
Pe.atr.485-ECA1694-YP_049795.1-CheY-1-1CheV         VVDDFSTMRRIVRNLLKELG-----FNNVEEAEDGSDALNKLRSAGFDFVISED
Pa.ana.1905-PAJ_1537-YP005934413.1-CheY-1-1CheV    VVDDFNTMRRIVRNLLKELG-----FNNVEEAEDGDVADLNKLAGGFGFVISED
En.asb.1498-Entas_2587-YP_004829101.1-CheY-1-1CheV  VVDDFSTMRRIVRNLLKELG-----FNNVEEAEDGDVADLNKLAGGFGFVISED
Sa.ent.407-STM1961-NP_460873.1-CheY-1-1CheV         VVDDFSTMRRIVRNLLKELG-----FNNVEEAEDGDVADLNKLAGGFGFVISED
Es.fer.1173-EFER_1144-YP_002382306.1-CheY-1-1CheV  VVDDFSTMRRIVRNLLKELG-----FNNVEEAEDGDVADLNKLAGGFGFVISED
Ra.aqu.1678-Q7S_08980-YP_005401601.1-CheY-1-1CheV  VVDDFSTMRRIVRNLLKELG-----FNNVEEAEDGDVADLNKLRAGGDFVISED
Ci.rod.62-ROD_19301-YP_003365487.1-CheY-1-1CheV    VVDDFSTMRRIVRNLLKELG-----FNNVEEAEDGDVADLNKLAGGFGFVISED
Sa.ent.404-STY2125-NP_456482.1-CheY-1-1CheV         VVDDFSTMRRIVRNLLKELG-----FNNVEEAEDGDVADLNKLAGGFGFVISED
Di.zea.1140-Dd1591_1545-YP_003003878.1-CheY-1-1CheV VVDDFSTMRRIVRNLLKELG-----FNNVEEAEDGDADLNKLRSGGFDFVISED
Ci.kos.578-CRO_01070-YP_001452649.1-CheY-1-1CheV   VVDDFSTMRRIVRNLLKELG-----FNNVEEAEDGDVADLNKLAGGFGFVISED
Cr.sak.579-ESA_01352-YP_001437448.1-CheY-1-1CheV   VVDDFSTMRRIVRNLLKELG-----FNNVEEAEDGDVADLNKLAGGFGFVISED
Di.dad.235-Dda3937_02776-YP_003883637.1-CheY-1-1CheV VVDDFSTMRRIVRNLLKELG-----FNNVEEAEDGDADLNKLRSGGDFVISED
Ye.ent.378-YE2570-YP_001006774.1-CheY-1-1CheV     VVDDFSTMRRIVRNLLKELG-----FNNVEEAEDGDVADLNKLRTGGFDFVISED
Cr.tur.6-CTU_25740-YP_003210937.1-CheY-1-1CheV    VVDDFSTMRRIVRNLLKELG-----FNNVEEAEDGDVADLNKLQTTGGFDFVISED
Er.tas.1011-ETA_14700-YP_001907409.1-CheY-1-1CheV  VVDDFNTMRRIVRNLLKELG-----FNNVEEAEDGDVADLNKLRAGGDFVISED
Er.bil.197-Ebc_25310-YP_003741909.1-CheY-1-1CheV  VVDDFNTMRRIVRNLLKELG-----FNNVEEAEDGDVADLNKLRTGGFDFVISED
Pa.ana.1905-PAJ_0248-YP_005933124.1-F7-1-RR_CheV   VAEDSKVARQLLEQGLKSMGIPALMNTGLEAWEKIKEMHQQAQAGESIHDKIALVLT
Pa.vag.184-Pvag_0292-YP_003929954.1-F7-1-RR_CheV   VAEDSKVARQLLEQGLKSMGIPALMNTGLEAWEKIKLMSQEAQAAGESIHDKIALVLT
Er.tas.1011-ETA_19840-YP_001907913.1-F7-1-RR_CheV  VAEDSKVARQMLEQGLKAMGIPAMMYNTGLEAWKIKQMYQEAQAAGVSIHDKIGLILTD
Pantoe.297-Pat9b_0852-YP_004114732.1-F7-1-RR_CheV VAEDSKVARQLLEQGLQSMGIPALMHTGLEAWQKITQMQQEAQAAGESIHDKIALVLT
Pectob.2320-W5S_1751-YP_006282714.1-F7-1-RR_CheV  VAEDSKVARSLLEQGLTQMGIPFSMHITGQDANKIRQIAQEAQSEGRPI SDKISLVLT
Pe.atr.485-ECA1568-YP_049670.1-F7-1-RR_CheV       VAEDSKVARSLLEQGLTQMGIPFSMHITGQDANKIRQIAQEAQSEGRPI SDKISLVLT
Pe.car.1139-PC1_1449-YP_003017031.1-F7-1-RR_CheV  VAEDSKVARSLLEQGLTQMGIPFSMHITGQDANKIRQIAQEAQSEGRPI SDKISLVLT
Er.bil.197-Ebc_11920-YP_003740575.1-F7-1-RR_CheV  VAEDSKVARQMLEQGLKAMGIPAEHNTGLEAWNIRSIQQAQAKGEGPIRDKISMLVLT
Es.fer.1173-EFER_0899-YP_002382071.1-F7-1-RR_CheV VAEDSKVARALLEKVLNTMQIPVHMHTGKSAWENIQQLARQAQEGVPSKIALVLT
Cr.tur.6-CTU_17860-YP_003210149.1-F7-1-RR_CheV    VAEDSKVARSMLEHGLKSMGIPALMHTTGLEAWEKIKLMAKEQAQEGSITDKIAMVLT
Cr.sak.579-ESA_02190-YP_001438275.1-F7-1-RR_CheV  VAEDSKVARSMLEHGLKSMGIPALMHTTGLEAWEKIKLMAKEQAQEGSITDKIAMVLT
Ra.aqu.1678-Q7S_09145-YP_005401634.1-F7-1-RR_CheV VAEDSKVARQMLEKGLNMMIEIPQMHVTGLEAWNIRKMAEACKAQLPI SDKISFVLT
Rahnel.1320-Rahaq_1865-YP_004212610.1-F7-1-RR_CheV VAEDSKVARQMLEKGLNMMIEIPQMHVTGLEAWNIRKMAEACKAQLPI SDKISFVLT
Ye.ent.378-YE2673-YP_001006864.1-F7-1-RR_CheV     VAEDSKVARSMLEQALKMMDIPAVMHITGLEAWNKKIADAEARAEGRVPSDKISFVLT
En.638.865-Ent638_2819-YP_001177535.1-F7-1-RR_CheV VAEDSKVARSMLEKGLEAMNIPAEHMTGKEAWEKIGVLAQAQAEQVPI TDKISLVLT
Sa.ent.407-STM2314-NP_461256.1-F7-1-RR_CheV       VAEDSKVARAMLEKGLNAMGIPHQMHVTGKDAWERIQQLAQEAQAEAGKPISEKIALVLT
Sa.bon.1474-SBG_2102-YP_004730935.1-F7-1-RR_CheV  VAEDSKVARAMLEKGLNAMEIPHQMHVTGKDAWEKIQLAQEAQAEAGKPISEKIALVLT
Sa.ent.404-STY2545-NP_456857.1-F7-1-RR_CheV       VAEDSKVACAMLEKGLNAMEIPHQMHVTGKDAWERIQQLAQEAQAEAGKPISEKIALVLT
Ci.kos.578-CRO_00521-YP_001452113.1-F7-1-RR_CheV  VAEDSKVARAMLEKGLNAMEIPHQMHVTGQDAWEKIQLAQEAQAEAGKPISEKIALVLT
En.clo.1544-EcWSU1_03147-YP_004952996.1-F7-1-RR_CheV VAEDSKVARSMLEKGLQAMEIPAQLHITGKDAWEKISVLAQAQAEQVPI TDKIALVLT
En.asb.1498-Entas_2991-YP_004829501.1-F7-1-RR_CheV VAEDSKVARSMLEKGLQAMEIPAQLHITGKDAWEKISVLAQAQAEQVPI TDKIALVLT
Di.dad.235-Dda3937_02985-YP_003882467.1-F7-1-RR_CheV VAEDSKVARTMLETGLKVMNIPYIMHITGLEAWNRIKMAEAEAKAEGRPI SDKIAFVLT
Ci.rod.62-ROD_26761-YP_003366207.1-F7-1-RR_CheV  VAEDSRVARAMLEKGLNAMDIPHQMHVTGKDAWEKILLAKEAEAGKAISEKIALVLT
Di.zea.1140-Dd1591_2613-YP_003004925.1-F7-1-RR_CheV VAEDSKVARNMLETGLKVMNIPYIMHITGLEAWNRIKMAEQAQAEGRPI SDKIAFVLT

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