

Table A.2 Accession numbers and organisms used to align YchF primary sequences.  
Accession numbers were obtained from the UniProt and EntrezGene databases.

**Accession Number [Organism]**

>AGE94351 [Citrobacter amalonaticus Y19]  
>AGQ30704 [Serratia liquefaciens ATCC 27592]  
>CCV61392 [Yersinia enterocolitica (type O:2) str. YE3094/96]  
>CDF99950 [Avibacterium paragallinarum JF4211]  
>NP\_245100 [Pasteurella multocida subsp. multocida str. Pm70]  
>NP\_287449 [Escherichia coli O157:H7 str. EDL933]  
>NP\_309735 [Escherichia coli O157:H7 str. Sakai]  
>NP\_438555 [Haemophilus influenzae Rd KW20]  
>NP\_456294 [Salmonella entericasubsp. enterica serovar Typhi str. CT18]  
>NP\_669606 [Yersinia pestis KIM10+]  
>NP\_716810 [Shewanella oneidensis MR-1]  
>NP\_753566 [Escherichia coli CFT073]  
>NP\_759269 [Vibrio vulnificusCMCP6]  
>NP\_873485 [Haemophilus ducreyi35000HP]  
>NP\_929315 [Photorhabdus luminescens subsp. laumondii TTO1]  
>WP\_000505846 [Escherichia coli]  
>WP\_000505852 [Salmonella enterica]  
>WP\_000505854 [Salmonella enterica]  
>WP\_000505856 [Salmonella enterica]  
>WP\_000505858 [Escherichia coli]  
>WP\_000505860 [Escherichia albertii]  
>WP\_000505861 [Escherichia albertii]  
>WP\_000505862 [Escherichia coli]  
>WP\_000505863 [Escherichia sp. TW10509]  
>WP\_000505865 [Escherichia coli]  
>WP\_000505868 [Escherichia fergusonii]  
>WP\_000505869 [Escherichia albertii]  
>WP\_000505870 [Escherichia coli]  
>WP\_000505871 [Escherichia coli]  
>WP\_000505873 [Escherichia coli]  
>WP\_000505874 [Escherichia coli]  
>WP\_000505876 [Shigella flexneri]  
>WP\_001465305 [Escherichia coli]  
>WP\_001494153 [Escherichia coli]  
>WP\_001516531 [Escherichia coli]  
>WP\_001517931 [Escherichia coli]  
>WP\_001530768 [Salmonella enterica]  
>WP\_001537693 [Escherichia coli]  
>WP\_001538644 [Escherichia coli]  
>WP\_001546593 [Escherichia coli]  
>WP\_001550995 [Escherichia coli]  
>WP\_001556901 [Escherichia coli]

>WP\_001604961 [Salmonella enterica]  
>WP\_001607243 [Escherichia coli]  
>WP\_001609980 [Escherichia coli]  
>WP\_001616800 [Escherichia coli]  
>WP\_001620716 [Escherichia coli]  
>WP\_001637806 [Escherichia coli]  
>WP\_001654205 [Escherichia coli]  
>WP\_001658110 [Escherichia coli]  
>WP\_001668539 [Escherichia coli]  
>WP\_001693924 [Escherichia coli]  
>WP\_001705043 [Escherichia coli]  
>WP\_001722359 [Salmonella enterica]  
>WP\_001734245 [Salmonella enterica]  
>WP\_001748456 [Salmonella enterica]  
>WP\_001757317 [Escherichia coli]  
>WP\_001764442 [Escherichia coli]  
>WP\_002422463 [Yersinia pestis]  
>WP\_002422463 [Yersinia pestis]  
>WP\_002952879 [Salmonella enterica]  
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>WP\_003850816 [Pantoea sp. aB]  
>WP\_003856650 [Enterobacter sp. SST3]  
>WP\_004000535 [Escherichia coli]  
>WP\_004090378 [Hafnia alvei]  
>WP\_004113672 [Klebsiella oxytoca]  
>WP\_004121834 [Klebsiella oxytoca]  
>WP\_004133353 [Klebsiella oxytoca]  
>WP\_004145441 [Klebsiella pneumoniae]  
>WP\_004148779 [Klebsiella pneumoniae]  
>WP\_004169623 [Erwinia amylovora]  
>WP\_004203224 [Klebsiella pneumoniae]  
>WP\_004264113 [Providencia rettgeri]  
>WP\_004390746 [Yersinia kristensenii]  
>WP\_004401503 [Vibrio nigripulchritudo]  
>WP\_004698923 [Yersinia aldovae]  
>WP\_004708598 [Yersinia frederiksenii]  
>WP\_004715188 [Yersinia frederiksenii ATCC 33641]  
<WP\_004721156 [Yersinia ruckeri]  
>WP\_004851898 [Klebsiella sp. OBRC7]  
>WP\_004875669 [Yersinia mollaretii]  
>WP\_004910600 [Providencia rettgeri]  
>WP\_004961991 [Serratia odorifera]  
>WP\_005122324 [Shigella flexneri]  
>WP\_005185140 [Yersinia intermedia]  
>WP\_005271995 [Yersinia bercovieri]

>WP\_005284745 [Edwardsiella tarda]  
>WP\_005298458 [Aeromonas aquariorum]  
>WP\_005330171 [Aeromonas media]  
>WP\_005334961 [Aeromonas veronii]  
>WP\_005343844 [Aeromonas veronii]  
>WP\_005351686 [Aeromonas diversa]  
>WP\_005362218 [Aeromonas veronii]  
>WP\_005503643 [Grimontia hollisae] >  
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>WP\_005576101 [Aggregatibacter actinomycetemcomitans]]  
>WP\_005592918 [Aggregatibacter actinomycetemcomitans]  
>WP\_005595644 [Actinobacillus pleuropneumoniae]  
>WP\_005609599 [Actinobacillus pleuropneumoniae]  
>WP\_005622260 [Actinobacillus ureae]  
>WP\_005627284 [Haemophilus haemolyticus]  
>WP\_005630014 [Haemophilus haemolyticus]  
>WP\_005639239 [Haemophilus haemolyticus]  
>WP\_005641665 [Haemophilus haemolyticus]  
>WP\_005652207 [Haemophilus influenzae]  
>WP\_005659866 [Haemophilus influenzae]  
>WP\_005662634 [Haemophilus influenzae]  
>WP\_005666567 [Haemophilus influenzae]  
>WP\_005669153 [Haemophilus influenzae]  
>WP\_005686842 [Haemophilus influenzae]  
>WP\_005688776 [Haemophilus influenzae]  
>WP\_005696459 [Haemophilus parainfluenzae]  
>WP\_005698295 [Haemophilus parainfluenzae]  
>WP\_005705014 [Aggregatibacter aphrophilus]  
>WP\_005706109 [Haemophilus parahaemolyticus]

>WP\_005751131 [*Pasteurella multocida*]  
 >WP\_005753470 [*Pasteurella multocida*]  
 >WP\_005755974 [*Pasteurella multocida*]  
 >WP\_005761544 [*Pasteurella bettyae*]  
 >WP\_005762848 [*Pasteurella dagmatis*]  
 >WP\_005822831 [*Actinobacillus minor*]  
 >WP\_005907895 [*Aeromonas molluscorum*]  
 >WP\_006118895 [*Pantoea stewartii*]  
 >WP\_006175915 [*Enterobacter cancerogenus*]  
 >WP\_006316742 [*Serratia plymuthica*]  
 >WP\_006659996 [*Providencia alcalifaciens*]  
 >WP\_006684244 [*Citrobacter youngae*]  
 >WP\_006705331 [*Candidatus Regiella insecticola*]  
 >WP\_006705761 [*Candidatus Regiella insecticola*]  
 >WP\_006708113 [*Serratia symbiotica*]  
 >WP\_006810923 [*Enterobacter hormaechei*]  
 >WP\_006813188 [*Providencia rustigianii*]  
 >WP\_006820262 [*Yokenella regensburgei*]  
 >WP\_006963107 [*Vibrio coralliilyticus*]  
 >WP\_007242919 [*Haemophilus pittmaniae*]  
 >WP\_007371850 [*Kosakonia radicincitans*]  
 >WP\_007470740 [*Photobacterium* sp. AK15]  
 >WP\_007523369 [*Haemophilus sputorum*]  
 >WP\_007682141 [*Cronobacter condimenti*]  
 >WP\_007698603 [*Cronobacter universalis*]  
 >WP\_007729929 [*Cronobacter dublinensis*]  
 >WP\_007749723 [*Cronobacter dublinensis*]  
 >WP\_007892915 [*Pantoea* sp. GM01]  
 >WP\_008107633 [*Pantoea* sp. YR343]  
 >WP\_008454161 [*Enterobacter* sp. Ag1]  
 >WP\_008607321 [*Alishewanella agri*]  
 >WP\_008911387 [*Providencia burhodogranariae*]  
 >WP\_008915585 [*Providencia sneebia*]  
 >WP\_009090646 [*Pantoea* sp. Sc1]  
 >WP\_009112733 [*Brenneria* sp. EniD312]  
 >WP\_009635421 [*Serratia* sp. M24T3]  
 >WP\_009766680 [*Haemophilus* sp. oral taxon 851]  
 >WP\_010245885 [*Pantoea* sp. SL1\_M5]  
 >WP\_010308075 [*Pectobacterium carotovorum*]  
 >WP\_010560395 [*Pseudoalteromonas spongiae*]  
 >WP\_010616312 [*Plautia stali symbiont*]  
 >WP\_010669981 [*Pantoea agglomerans*]  
 >WP\_010673843 [*Aeromonas caviae*]  
 >WP\_010862060 [*Plesiomonas shigelloides*] >gi|499067985  
 |gb|EÖN90283.1| [*Plesiomonas shigelloides* 302-73]  
 >WP\_016150360 [*Citrobacter* sp.KTE30]

>WP\_016153303 [*Citrobacter* sp.KTE32]  
 >WP\_016192857 [*Erwinia tracheiphila*]  
 >WP\_016266206 [*Yersinia enterocolitica*]  
 >WP\_016533981 [*Pasteurella multocida*]  
 >WP\_016536784 [*Cedecea davisae*]  
 >WP\_016584357 [*Yersinia pestis*]  
 >WP\_016715959 [*Salmonella enterica*]  
 >WP\_016808843 [*Klebsiella oxytoca*]  
 >WP\_016947194 [*Klebsiella pneumoniae*]  
 >WP\_017026146 [*Vibrio rumoiensis*]  
 >WP\_017027131 [*Vibrio breoganii*]  
 >WP\_017242826 [*Vibrio breoganii*]  
 >WP\_017349043 [*Pantoea* sp. A4]  
 >WP\_017372229 [Enterobacteriaceae bacterium LSJC7]  
 >WP\_017412588 [*Aeromonas salmonicida*]  
 >WP\_017457133 [*Enterobacter cloacae*]  
 >WP\_017492160 [gamma proteobacterium WG36]  
 >WP\_017781634 [*Aeromonas hydrophila*]  
 >WP\_017802058 [*Erwinia toletana*]  
 >WP\_017806972 [*Avibacterium paragallinarum*]  
 >WP\_018356072 [*Pasteurella pneumotropica*]  
 >WP\_018356072 [*Pasteurella pneumotropica*]  
 >WP\_019079660 [*Yersinia enterocolitica*]  
 >WP\_019209789 [*Yersinia massiliensis*]  
 >WP\_019846385 [*Dickeya zeae*]  
 >WP\_020690896 [*Thauera selenatis*]  
 >XP\_003493072 [*Bombus impatiens*]  
 >XP\_004531855 [*Ceratitis capitata*]  
 >YP\_050277 [*Pectobacterium atrosepticum* SCRI1043]  
 >YP\_087747 [*Mannheimia succiniciproducens* MBEL55E]  
 >YP\_150370 [*Salmonella enterica* subsp. *enterica* serovarParatyphi A str. ATCC 9150]  
 >YP\_248108 [*Haemophilus influenzae* 86-028NP]  
 >YP\_310876 [*Shigella sonnei* Ss046]  
 >YP\_455562 [*Sodalis glossinidius* str. 'morsitans']  
 >YP\_718714 [*Haemophilus somnus*129PT]  
 >YP\_857656 [*Aeromonas hydrophila* subsp. *hydrophila* ATCC 7966]  
 >YP\_928443 [*Shewanella amazonensis* SB2B]  
 >YP\_962456 [*Shewanella* sp. W3-18-1]  
 >YP\_001006652 [*Yersinia enterocolitica* subsp. *enterocolitica* 8081]  
 >YP\_001052747 [*Actinobacillus pleuropneumoniae* serovar 5b str. L20]  
 >YP\_001141027 [*Aeromonas salmonicida* subsp. *salmonicida* A449]  
 >YP\_001292348 [*Haemophilus influenzae* PittGG]  
 >YP\_001335899 [*Klebsiella pneumoniae* subsp. *pneumoniae* MGH 78578]  
 >YP\_001344707 [*Actinobacillus succinogenes* 130Z]  
 >YP\_001437582 [*Cronobacter sakazakii* ATCC BAA-894]  
 >YP\_001452834 [*Citrobacter koseri* ATCC BAA-895]

>YP\_001478213 [*Serratia proteamaculans* 568]  
 >YP\_001570215 [*Salmonella enterica* subsp. *arizonae* serovar 62:z4,z23:- str. RSK2980] >YP\_001606886 [*Yersinia pestis* Angola]  
 >YP\_001907820 [*Erwinia tasmaniensis* Et1/99]  
 >YP\_002150823 [*Proteus mirabilis* HI4320]  
 >YP\_003008727 [*Aggregatibacter aphrophilus* NJ8700]  
 >YP\_003017697 [*Pectobacterium carotovorum* subsp. *carotovorum* PC1]  
 >YP\_003041377 [*Photobacterium asymbiotica*]  
 >YP\_003210795 [*Cronobacter turicensis* z3032]  
 >YP\_003256131 [*Aggregatibacter actinomycetemcomitans* D11S-1]  
   >YP\_003259790 [*Pectobacterium wasabiae* WPP163]  
 >YP\_003333575 [*Dickeya dadantii* Ech586]  
 >YP\_003365373 [*Citrobacter rodentium* ICC168]  
 >YP\_003468093 [*Xenorhabdus bovienii* SS-2004]  
 >YP\_003519929 [*Pantoea ananatis* LMG 20103]  
 >YP\_003530955 [*Erwinia amylovora* CFBP1430]  
 >YP\_003558138 [*Shewanella violacea* DSS12]  
 >YP\_003612096 [*Enterobacter cloacae* subsp. *cloacae* ATCC 13047]  
 >YP\_003712340 [*Xenorhabdus nematophila* ATCC 19061]  
 >YP\_003741180 [*Erwinia billingiae* Eb661]  
 >YP\_003883104 [*Dickeya dadantii* 3937]  
 >YP\_003883104 [*Dickeya dadantii* 3937]  
 >YP\_003930708 [*Pantoea vagans* C9-1]  
 >YP\_003941576 [*Enterobacter lignolyticus* SCF1]  
 >YP\_004116212 [*Pantoea* sp. At-9b]  
 >YP\_004138166 [*Haemophilus influenzae* F3047]  
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 >YP\_004500368 [*Serratia* sp. AS12]  
 >YP\_004593528 [*Enterobacter aerogenes* KCTC 2190]  
 >YP\_004730498 [*Salmonella bongori* NCTC 12419]  
 >YP\_004823001 [*Haemophilus parainfluenzae* T3T1]  
 >YP\_004828967 [*Enterobacter asburiae* LF7a]  
 >YP\_004952502 [*Enterobacter cloacae* EcWSU1]  
 >YP\_005020601 [*Klebsiella oxytoca* KCTC 1686]  
 >YP\_005178534 [*Haemophilus influenzae* 10810]  
 >YP\_005200384 [*Rahnella aquatilis* CIP 78.65 = ATCC 33071]  
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 >YP\_005828704 [*Haemophilus influenzae* R2846]  
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 >YP\_006218484 [*Providencia stuartii* MRSN 2154]  
 >YP\_006283354 [*Pectobacterium* sp. SCC3193]  
 >YP\_006287403 [*Aggregatibacter actinomycetemcomitans* D7S-1]

>YP\_006319471 [*Shimwellia blattae* DSM 4481 = NBRC 105725]  
>YP\_006579085 [*Enterobacter cloacae* subsp. *cloacae* ENHKU01]  
>YP\_006646819 [*Pectobacterium carotovorum* subsp. *carotovorum* PCC21]  
>YP\_006817780 [*Actinobacillus suis* H91-0380]  
>YP\_007340053 [Enterobacteriaceae bacterium strain FGI57]  
>YP\_007345007 [*Serratia marcescens* FGI94]  
>YP\_007388113 [*Enterobacter aerogenes* EA1509E]  
>YP\_007388113 [*Enterobacter aerogenes* EA1509E]  
>YP\_007505403 [*Morganella morganii* subsp. *morganii* KT]  
>YP\_007547813 [*Bibersteinia trehalosi* USDA-ARS-USMARC-192]  
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>YP\_008106160 [*Enterobacter* sp. R4-368]  
>YP\_008123360 [*Haemophilus parasuis* ZJ0906]  
>YP\_008137997 [*Serratia plymuthica* 4Rx13]