**Figure S2. CcoA of Proteobacteria** (see legend below)

| Organism               | Sequence Representation                  | Length |
|------------------------|-----------------------------------------|--------|
| Thalassospira          | vaftmiamvttapsalnrfgrvfgfwigvlgma-vsgmgtvfgswllavca | 107    |
| Synechococcus          | lairqvatmsatipasvqlrrgrrngllgviaga-glsyiysltisyfalsma | 109    |
| Halomonas              | vatqwlgmcatipaslarmkrgkfllnlglagv-vvaqalvteflflnltw | 102    |
| Vibrio                 | valqflgmsatipaslarmkgrkrgfllgnllglagv-vaqalvteflflnltw | 102    |
| Pseudoalteromonas capsulatus | iatqmlglllatvpaslvaktgrklgfsmgnligtsga-ilgylalinsqfylf | 102    |
| Thioalkalivibrio       | vaammigtlvitlpaslfkrgrrtgfllgagvggaaiaavgvfaefwflgln | 111    |
| Methylobacterium       | vslynlglalstipaallrllgrraayalgallgsvsgliaalgvlwgsfetf | 110    |
| Vibrio                 | vaftmiamvttapsalnrfgrvfgfwigvlgma-vsgmgtvfgswllavca | 107    |
| Thalassospira          | vaftmiamvttapsalnrfgrvfgfwigvlgma-vsgmgtvfgswllavca | 107    |
| Synechococcus          | lairqvatmsatipasvqlrrgrrngllgviaga-glsyiysltisyfalsma | 109    |
| Halomonas              | vatqwlgmcatipaslarmkrgkfllnlglagv-vvaqalvteflflnltw | 102    |
| Vibrio                 | valqflgmsatipaslarmkgrkrgfllgnllglagv-vaqalvteflflnltw | 102    |
| Pseudoalteromonas capsulatus | iatqmlglllatvpaslvaktgrklgfsmgnligtsga-ilgylalinsqfylf | 102    |
| Thioalkalivibrio       | vaammigtlvitlpaslfkrgrrtgfllgagvggaaiaavgvfaefwflgln | 111    |
| Methylobacterium       | vslynlglalstipaallrllgrraayalgallgsvsgliaalgvlwgsfetf | 110    |
| Vibrio                 | vaftmiamvttapsalnrfgrvfgfwigvlgma-vsgmgtvfgswllavca | 107    |
| Thalassospira          | vaftmiamvttapsalnrfgrvfgfwigvlgma-vsgmgtvfgswllavca | 107    |
| Synechococcus          | lairqvatmsatipasvqlrrgrrngllgviaga-glsyiysltisyfalsma | 109    |
| Halomonas              | vatqwlgmcatipaslarmkrgkfllnlglagv-vvaqalvteflflnltw | 102    |
| Vibrio                 | valqflgmsatipaslarmkgrkrgfllgnllglagv-vaqalvteflflnltw | 102    |
| Pseudoalteromonas capsulatus | iatqmlglllatvpaslvaktgrklgfsmgnligtsga-ilgylalinsqfylf | 102    |
| Thioalkalivibrio       | vaammigtlvitlpaslfkrgrrtgfllgagvggaaiaavgvfaefwflgln | 111    |
| Methylobacterium       | vslynlglalstipaallrllgrraayalgallgsvsgliaalgvlwgsfetf | 110    |
| Vibrio                 | vaftmiamvttapsalnrfgrvfgfwigvlgma-vsgmgtvfgswllavca | 107    |
| Thalassospira          | vaftmiamvttapsalnrfgrvfgfwigvlgma-vsgmgtvfgswllavca | 107    |
| Synechococcus          | lairqvatmsatipasvqlrrgrrngllgviaga-glsyiysltisyfalsma | 109    |
| Halomonas              | vatqwlgmcatipaslarmkrgkfllnlglagv-vvaqalvteflflnltw | 102    |
| Vibrio                 | valqflgmsatipaslarmkgrkrgfllgnllglagv-vaqalvteflflnltw | 102    |
| Pseudoalteromonas capsulatus | iatqmlglllatvpaslvaktgrklgfsmgnligtsga-ilgylalinsqfylf | 102    |
| Thioalkalivibrio       | vaammigtlvitlpaslfkrgrrtgfllgagvggaaiaavgvfaefwflgln | 111    |
| Methylobacterium       | vslynlglalstipaallrllgrraayalgallgsvsgliaalgvlwgsfetf | 110    |
| Vibrio                 | vaftmiamvttapsalnrfgrvfgfwigvlgma-vsgmgtvfgswllavca | 107    |
| Thalassospira          | vaftmiamvttapsalnrfgrvfgfwigvlgma-vsgmgtvfgswllavca | 107    |
| Synechococcus          | lairqvatmsatipasvqlrrgrrngllgviaga-glsyiysltisyfalsma | 109    |
| Halomonas              | vatqwlgmcatipaslarmkrgkfllnlglagv-vvaqalvteflflnltw | 102    |
| Vibrio                 | valqflgmsatipaslarmkgrkrgfllgnllglagv-vaqalvteflflnltw | 102    |
| Pseudoalteromonas capsulatus | iatqmlglllatvpaslvaktgrklgfsmgnligtsga-ilgylalinsqfylf | 102    |
| Thioalkalivibrio       | vaammigtlvitlpaslfkrgrrtgfllgagvggaaiaavgvfaefwflgln | 111    |
| Methylobacterium       | vslynlglalstipaallrllgrraayalgallgsvsgliaalgvlwgsfetf | 110    |
Pseudomonas

Thalassospira

Synechococcus

Halomonas

Vibrio

Pseudoalteromonas capsulatus

Thioalkalivibrio

Methylobacterium

Bordetella

Ochrobactrum

Pseudomonas

Thalassospira

Synechococcus

Halomonas

Vibrio

Pseudoalteromonas capsulatus

Thioalkalivibrio

Methylobacterium

Bordetella

Ochrobactrum

Pseudomonas

Thalassospira

Synechococcus

Halomonas

Vibrio

Pseudoalteromonas capsulatus

Thioalkalivibrio

Methylobacterium

Bordetella

Ochrobactrum

Pseudomonas

Thalassospira

Synechococcus

Halomonas

Vibrio

Pseudoalteromonas capsulatus

Thioalkalivibrio

Methylobacterium

Bordetella

Ochrobactrum

Pseudomonas
Pseudomonas igtsgllalagel-lhfwgslillvgwnfgfigatalvtdcytaperakvqlndflv 347

Thalassospira fgtvavaslagsiya------gagwatllysaalpvgvlvmvlagayalryrqqha---- 395
Synechococcus fgfvaialtyssgqify------sfdwvmln-giswpvlvlavlltvwlqnqlissnqr-- 397
Halomonas fstvattallagplvn------qlgwalin-allmplslvpiallgwqrllrrrdqphis 391
Vibrio fscvttallsgwles------tvgwemmn-lyvlpfvvlvlalfgynftrsrqsla------ 389
Pseudoalteromonas fsmvvsllfagwles------kigwqain-vwsipvvllaf--iasvwfrrrssplpia 388
capsulatus FGGVFLASLSSGGLMTCASADAVAGWQA--LAMLPLTLAGAILWLVLRPKDTR---- 405
Thioalkalivibrio ftlvaagsllagallr------plgwdfim-lamlpia-vltvailwlrddarappra-- 399
Methylobacterium fgtnavgsfasgglla------hygwdrvl-wvsfplavavaalalaasrpapaag-- 406
Bordetella fgmlalsfssgglls------aygwntvl-wvsfplvvaavalvplpsrl-isgrage 402
Ochrobactrum FGTVACSFAGSLLH------SSGWETIN-WLVFIVALVLVLPIIR----LKPFGAAAE 397
Pseudomonas fgtvavasfgsrlin------tsgwetin-gllmplialvllallgwawrrrqqaaa-- 400
* : : : : : : : * : : : :

Thalassospira --- 395
Synechococcus --- 397
Halomonas g-- 392
Vibrio --- 389
Pseudoalteromonas dkp 391
capsulatus --- 405
Thioalkalivibrio --- 399
Methylobacterium --- 406
Bordetella gek 405
Ochrobactrum A-- 398
Pseudomonas ap- 402

Figure S2. Alignments of CcoA amino acid sequences among Proteobacterial species. The CcoA sequences are from Rhodobacter capsulatus (capsulatus) from Rhodobacterales, Methylobacterium platani (Methylobacterium) and Ochrobactrum anthropi (ochrabactrum) from Rhizobiales, Bordetella pertussis (Bordetella) from Burkholderiales, Pseudomonas aeruginosa (Pseudomonas) from Pseudomonales, Thalassospira luteoviolacea (Thalassospira) from Rhodospirales, Vibrio orientalis (Vibrio) from vibionales, Halomonas desiderata (Halomonas) from Oceanospirales, Synechococcus sp. (Synechococcus) from Synechococcales, Pseudoalteromonas luteoviolacea (Pseudoalteromonas) from Alteromonadales, Thioalkalivibrio versutus (Thioalkalivibrio) from Chromatiales. The Met, His and Cys residues of interest are highlighted in yellow, green, and purple, respectively.