

Table S1. ALR Taxonomy Statistics<sup>a</sup>

| BACTERIA <sup>b</sup>        | Rank <sup>c</sup> | RECs <sup>d</sup> | RECs in CGs <sup>e</sup> | CGs <sup>f</sup> | CGs w/ RECs <sup>g</sup> | REC Max <sup>h</sup> | REC Min <sup>i</sup> | Total ALRs <sup>j</sup> | ALRs in CGs <sup>k</sup> | CGs w/ ALRs <sup>l</sup> | ALR Max <sup>m</sup> | ALR Min <sup>n</sup> | Avg. ALRs /CG <sup>o</sup> | Avg. ALRs/ REC CG <sup>p</sup> |
|------------------------------|-------------------|-------------------|--------------------------|------------------|--------------------------|----------------------|----------------------|-------------------------|--------------------------|--------------------------|----------------------|----------------------|----------------------------|--------------------------------|
| <i>Proteobacteria</i>        | phylum            | 176               | 173                      | 2                | 1                        | 173                  | 173                  | 6                       | 5                        | 1                        | 5                    | 5                    | 2.50                       | 5.00                           |
| <i>Alphaproteobacteria</i>   | class             | 10100             | 6073                     | 322              | 129                      | 185                  | 2                    | 504                     | 265                      | 101                      | 8                    | 1                    | 0.82                       | 2.05                           |
| <i>Betaproteobacteria</i>    | class             | 8359              | 4913                     | 187              | 75                       | 190                  | 3                    | 245                     | 123                      | 50                       | 12                   | 1                    | 0.66                       | 1.64                           |
| <i>Deltaproteobacteria</i>   | class             | 6175              | 4697                     | 64               | 40                       | 336                  | 9                    | 265                     | 200                      | 39                       | 22                   | 1                    | 3.13                       | 5.00                           |
| <i>Epsilonproteobacteria</i> | class             | 1305              | 758                      | 73               | 36                       | 78                   | 9                    | 119                     | 67                       | 34                       | 4                    | 1                    | 0.92                       | 1.86                           |
| <i>Gammaproteobacteria</i>   | class             | 23386             | 10420                    | 746              | 242                      | 140                  | 1                    | 466                     | 159                      | 96                       | 7                    | 1                    | 0.21                       | 0.66                           |
| <i>Zetaproteobacteria</i>    | class             | 67                | -                        | 1                | -                        | -                    | -                    | 1                       | -                        | -                        | -                    | -                    | 0                          | 0                              |
| <i>Chlamydiae (class)</i>    | class             | 37                | 24                       | 25               | 19                       | 4                    | 1                    | 1                       | -                        | -                        | -                    | -                    | 0                          | 0                              |
| <i>Lentisphaerae</i>         | phylum            | 39                | -                        | 2                | -                        | -                    | -                    | 1                       | -                        | -                        | -                    | -                    | 0                          | 0                              |
| <i>Verrucomicrobia</i>       | phylum            | 16                | 12                       | 2                | 1                        | 12                   | 12                   | 2                       | 1                        | 1                        | 1                    | 1                    | 0.50                       | 1.00                           |
| <i>Opitutae</i>              | class             | 233               | 203                      | 3                | 2                        | 162                  | 41                   | 12                      | 10                       | 2                        | 9                    | 1                    | 3.33                       | 5.00                           |
| <i>Spartobacteria</i>        | class             | 203               | -                        | 1                | -                        | -                    | -                    | -                       | -                        | -                        | -                    | -                    | 0                          | 0                              |
| <i>Verrucomicrobiae</i>      | class             | 315               | 5                        | 3                | 1                        | 5                    | 5                    | 12                      | -                        | -                        | -                    | -                    | 0                          | 0                              |
| <i>Bacilli</i>               | class             | 12060             | 3634                     | 596              | 157                      | 144                  | 2                    | 239                     | 77                       | 59                       | 9                    | 1                    | 0.13                       | 0.49                           |
| <i>Clostridia</i>            | class             | 7167              | 2948                     | 218              | 89                       | 94                   | 1                    | 214                     | 102                      | 52                       | 5                    | 1                    | 0.47                       | 1.15                           |
| <i>Erysipelotrichi</i>       | class             | 360               | 6                        | 16               | 1                        | 6                    | 6                    | 11                      | 1                        | 1                        | 1                    | 1                    | 0.06                       | 1.00                           |
| <i>Negativicutes</i>         | class             | 151               | 24                       | 18               | 3                        | 12                   | 3                    | 3                       | -                        | -                        | -                    | -                    | 0                          | 0                              |
| <i>Bacteroidetes</i>         | phylum            | 36                | 3                        | 3                | 1                        | 3                    | 3                    | 3                       | -                        | -                        | -                    | -                    | 0                          | 0                              |
| <i>Bacteroidia</i>           | class             | 2959              | 355                      | 77               | 12                       | 49                   | 6                    | 38                      | 4                        | 4                        | 1                    | 1                    | 0.05                       | 0.33                           |
| <i>Cytophagia</i>            | class             | 590               | 435                      | 8                | 5                        | 149                  | 41                   | 15                      | 11                       | 5                        | 4                    | 1                    | 1.38                       | 2.20                           |
| <i>Flavobacteria</i>         | class             | 845               | 454                      | 26               | 12                       | 87                   | 5                    | 37                      | 16                       | 8                        | 3                    | 1                    | 0.62                       | 1.33                           |
| <i>Sphingobacteria</i>       | class             | 755               | 363                      | 12               | 5                        | 154                  | 34                   | 21                      | 13                       | 5                        | 4                    | 1                    | 1.08                       | 2.60                           |
| <i>Chlorobia</i>             | class             | 221               | 187                      | 12               | 10                       | 50                   | 3                    | 12                      | 12                       | 6                        | 6                    | 1                    | 1.00                       | 1.20                           |
| <i>Chloroflexi</i>           | class             | 712               | 595                      | 7                | 6                        | 125                  | 89                   | 24                      | 19                       | 6                        | 6                    | 1                    | 2.71                       | 3.17                           |
| <i>Dehalococcoidetes</i>     | class             | 159               | 159                      | 6                | 6                        | 33                   | 19                   | 9                       | 9                        | 6                        | 2                    | 1                    | 1.50                       | 1.50                           |
| <i>Ktedonobacteria</i>       | class             | 175               | -                        | 1                | -                        | -                    | -                    | 14                      | -                        | -                        | -                    | -                    | 0                          | 0                              |
| <i>Thermomicrobia</i>        | class             | 55                | 55                       | 2                | 2                        | 38                   | 17                   | 4                       | 4                        | 1                        | 4                    | 4                    | 2.00                       | 2.00                           |
| <i>Cyanobacteria</i>         | phylum            | 3158              | 2002                     | 75               | 39                       | 195                  | 5                    | 202                     | 116                      | 37                       | 9                    | 1                    | 1.55                       | 2.97                           |
| <i>Gloeobacteria</i>         | class             | 56                | -                        | 1                | -                        | -                    | -                    | 3                       | -                        | -                        | -                    | -                    | 0                          | 0                              |
| <i>Acidobacteria</i>         | phylum            | 127               | 120                      | 3                | 1                        | 120                  | 120                  | 6                       | 6                        | 1                        | 6                    | 6                    | 2.00                       | 6.00                           |
| <i>Acidobacteria</i>         | class             | 207               | 207                      | 4                | 4                        | 60                   | 45                   | 9                       | 9                        | 4                        | 3                    | 2                    | 2.25                       | 2.25                           |
| <i>Solibacteres</i>          | class             | 162               | 162                      | 1                | 1                        | 162                  | 162                  | 6                       | 6                        | 1                        | 6                    | 6                    | 6.00                       | 6.00                           |
| <i>Fibrobacteres</i>         | class             | 30                | 60                       | 1                | 1                        | 60                   | 60                   | 2                       | 4                        | 1                        | 4                    | 4                    | 4.00                       | 4.00                           |

|                                |                         |                         |                                |                        |                                |                            |                            |                               |                                |                                |                            |                            |                                  |                                      |
|--------------------------------|-------------------------|-------------------------|--------------------------------|------------------------|--------------------------------|----------------------------|----------------------------|-------------------------------|--------------------------------|--------------------------------|----------------------------|----------------------------|----------------------------------|--------------------------------------|
| <i>Spirochaetes</i>            | class                   | 751                     | 493                            | 47                     | 20                             | 99                         | 3                          | 51                            | 32                             | 17                             | 4                          | 1                          | 0.68                             | 1.60                                 |
| <i>Actinobacteria</i>          | class                   | 7431                    | 3439                           | 392                    | 112                            | 119                        | 1                          | 146                           | 77                             | 47                             | 6                          | 1                          | 0.20                             | 0.69                                 |
| <i>Aquificae</i>               | class                   | 93                      | 63                             | 9                      | 5                              | 24                         | 8                          | 2                             | -                              | -                              | -                          | -                          | 0                                | 0                                    |
| <i>Chrysiogenetes</i>          | class                   | 83                      | 83                             | 1                      | 1                              | 83                         | 83                         | 7                             | 7                              | 1                              | 7                          | 7                          | 7.00                             | 7.00                                 |
| <i>Deferribacteres</i>         | class                   | 132                     | 132                            | 2                      | 2                              | 73                         | 59                         | 3                             | 3                              | 2                              | 2                          | 1                          | 1.50                             | 1.50                                 |
| <i>Deinococci</i>              | class                   | 310                     | 271                            | 13                     | 11                             | 51                         | 13                         | 6                             | 6                              | 4                              | 2                          | 1                          | 0.46                             | 0.55                                 |
| <i>Fusobacteria</i>            | class                   | 246                     | 59                             | 25                     | 4                              | 31                         | 5                          | 6                             | 1                              | 1                              | 1                          | 1                          | 0.04                             | 0.25                                 |
| <i>Gemmatimonadetes</i>        | class                   | 81                      | 81                             | 1                      | 1                              | 81                         | 81                         | 1                             | 1                              | 1                              | 1                          | 1                          | 1.00                             | 1.00                                 |
| <i>Nitrospira</i>              | class                   | 214                     | 157                            | 7                      | 2                              | 116                        | 41                         | 8                             | 8                              | 2                              | 5                          | 3                          | 1.14                             | 4.00                                 |
| <i>Planctomycetacia</i>        | class                   | 526                     | 221                            | 10                     | 4                              | 64                         | 49                         | 36                            | 15                             | 4                              | 6                          | 3                          | 1.50                             | 3.75                                 |
| <i>Candidatus Poribacteria</i> | phylum                  | 6                       | -                              | 1                      | -                              | -                          | -                          | 1                             | -                              | -                              | -                          | -                          | 0                                | 0                                    |
| <i>Bacteria</i>                | kingdom                 | 197                     | 35                             | 36                     | 1                              | 35                         | 35                         | 12                            | 1                              | 1                              | 1                          | 1                          | 0.03                             | 1.00                                 |
| <b>ARCHAEA<sup>b</sup></b>     | <b>Rank<sup>c</sup></b> | <b>RECs<sup>d</sup></b> | <b>RECs in CGs<sup>e</sup></b> | <b>CGs<sup>f</sup></b> | <b>CGs w/ RECs<sup>g</sup></b> | <b>REC Max<sup>h</sup></b> | <b>REC Min<sup>i</sup></b> | <b>Total ALRs<sup>j</sup></b> | <b>ALRs in CGs<sup>k</sup></b> | <b>CGs w/ ALRs<sup>l</sup></b> | <b>ALR Max<sup>m</sup></b> | <b>ALR Min<sup>n</sup></b> | <b>Avg. ALRs /CG<sup>o</sup></b> | <b>Avg. ALRs/ REC CG<sup>p</sup></b> |
| <i>Euryarchaeota</i>           | phylum                  | 27                      | 22                             | 5                      | 2                              | 14                         | 8                          | 1                             | 1                              | 1                              | 1                          | 1                          | 0.20                             | 0.50                                 |
| <i>Halobacteria</i>            | class                   | 237                     | 231                            | 16                     | 12                             | 41                         | 5                          | 52                            | 51                             | 11                             | 9                          | 1                          | 3.19                             | 4.25                                 |
| <i>Methanobacteria</i>         | class                   | 25                      | 23                             | 3                      | 2                              | 12                         | 11                         | 1                             | 1                              | 1                              | 1                          | 1                          | 0.33                             | 0.50                                 |
| <i>Methanomicrobia</i>         | class                   | 355                     | 351                            | 15                     | 14                             | 89                         | 1                          | 15                            | 15                             | 7                              | 5                          | 1                          | 1.00                             | 1.07                                 |
| <b>EUKARYOTA<sup>b</sup></b>   | <b>Rank<sup>c</sup></b> | <b>RECs<sup>d</sup></b> | <b>RECs in CGs<sup>e</sup></b> | <b>CGs<sup>f</sup></b> | <b>CGs w/ RECs<sup>g</sup></b> | <b>REC Max<sup>h</sup></b> | <b>REC Min<sup>i</sup></b> | <b>Total ALRs<sup>j</sup></b> | <b>ALRs in CGs<sup>k</sup></b> | <b>CGs w/ ALRs<sup>l</sup></b> | <b>ALR Max<sup>m</sup></b> | <b>ALR Min<sup>n</sup></b> | <b>Avg. ALRs /CG<sup>o</sup></b> | <b>Avg. ALRs/ REC CG<sup>p</sup></b> |
| <i>Bangiophyceae</i>           | class                   | 11                      | -                              | 6                      | -                              | -                          | -                          | 1                             | -                              | -                              | -                          | -                          | -                                | -                                    |
| <i>Coscinodiscophyceae</i>     | class                   | 8                       | -                              | 1                      | -                              | -                          | -                          | 1                             | -                              | -                              | -                          | -                          | -                                | -                                    |
| <i>Pelagophyceae</i>           | class                   | 6                       | -                              | 1                      | -                              | -                          | -                          | 1                             | -                              | -                              | -                          | -                          | -                                | -                                    |
| <i>Cryptophyta</i>             | class                   | 5                       | -                              | 3                      | -                              | -                          | -                          | 1                             | -                              | -                              | -                          | -                          | -                                | -                                    |
| <i>Chlorophyceae</i>           | class                   | 11                      | -                              | 1                      | -                              | -                          | -                          | 1                             | -                              | -                              | -                          | -                          | -                                | -                                    |
| <i>Trebouxiophyceae</i>        | class                   | 7                       | -                              | 1                      | -                              | -                          | -                          | 2                             | -                              | -                              | -                          | -                          | -                                | -                                    |
| Unnamed <i>Chlorophyta</i>     | class                   | 41                      | -                              | 4                      | -                              | -                          | -                          | 2                             | -                              | -                              | -                          | -                          | -                                | -                                    |
| <i>Streptophyta</i>            | phylum                  | 510                     | -                              | 56                     | -                              | -                          | -                          | 88                            | -                              | -                              | -                          | -                          | -                                | -                                    |
| <i>Coniferopsida</i>           | class                   | 5                       | -                              | 2                      | -                              | -                          | -                          | 1                             | -                              | -                              | -                          | -                          | -                                | -                                    |
| <i>Liliopsida</i>              | class                   | 296                     | -                              | 14                     | -                              | -                          | -                          | 75                            | -                              | -                              | -                          | -                          | -                                | -                                    |
| <i>Isoetopsida</i>             | class                   | 56                      | -                              | 1                      | -                              | -                          | -                          | 3                             | -                              | -                              | -                          | -                          | -                                | -                                    |
| <i>Oligohymenophorea</i>       | class                   | 257                     | -                              | 2                      | -                              | -                          | -                          | 12                            | -                              | -                              | -                          | -                          | -                                | -                                    |
| <i>Dothideomycetes</i>         | class                   | 122                     | -                              | 9                      | -                              | -                          | -                          | 6                             | -                              | -                              | -                          | -                          | -                                | -                                    |
| <i>Eurotiomycetes</i>          | class                   | 368                     | -                              | 37                     | -                              | -                          | -                          | 58                            | -                              | -                              | -                          | -                          | -                                | -                                    |
| <i>Leotiomycetes</i>           | class                   | 58                      | -                              | 4                      | -                              | -                          | -                          | 4                             | -                              | -                              | -                          | -                          | -                                | -                                    |
| <i>Sordariomycetes</i>         | class                   | 168                     | -                              | 18                     | -                              | -                          | -                          | 14                            | -                              | -                              | -                          | -                          | -                                | -                                    |
| <i>Pezizomycetes</i>           | class                   | 12                      | -                              | 1                      | -                              | -                          | -                          | 1                             | -                              | -                              | -                          | -                          | -                                | -                                    |
| <i>Agaricomycetes</i>          | class                   | 54                      | -                              | 7                      | -                              | -                          | -                          | 6                             | -                              | -                              | -                          | -                          | -                                | -                                    |

|                              |         |     |   |    |   |   |   |    |   |   |   |   |   |   |
|------------------------------|---------|-----|---|----|---|---|---|----|---|---|---|---|---|---|
| <i>Microsporidia</i>         | phylum  | 5   | - | 2  | - | - | - | 2  | - | - | - | - | 0 | 0 |
| <i>Saccharomycetes</i>       | class   | 140 | - | 30 | - | - | - | 21 | - | - | - | - | 0 | 0 |
| <i>Schizosaccharomycetes</i> | class   | 11  | - | 2  | - | - | - | 1  | - | - | - | - | 0 | 0 |
| <i>Arachnida</i>             | class   | 3   | - | 1  | - | - | - | 1  | - | - | - | - | 0 | 0 |
| <i>Anthozoa</i>              | class   | 17  | - | 1  | - | - | - | 1  | - | - | - | - | 0 | 0 |
| <i>Placozoa</i>              | phylum  | 4   | - | 1  | - | - | - | 1  | - | - | - | - | 0 | 0 |
| <i>Eukaryota</i>             | kingdom | 107 | - | 13 | - | - | - | 11 | - | - | - | - | 0 | 0 |
| unclassified sequences       | kingdom | 155 | - | 8  | - | - | - | 8  | - | - | - | - | 0 | 0 |

<sup>a</sup>Statistics derived from receiver domains (PF00072) obtained from the Pfam database version 26.0; REC, two-component response regulator receiver domain; ALR, Aspartate-Less Receiver domain; CG, Complete Genomes; Statistics are colored in accordance with Phyla; Bacterial Phyla with a single Class are colored in grey, with the exception of the *Spirochaetes*, *Actinobacteria*, *Chlorobia*, *Fibrobacteres* and *Chlamydiae*.

<sup>b</sup>Kingdom

<sup>c</sup>Class rank- higher ranks are given if a Class does not exist (*i.e.* phylum, and kingdom).

<sup>d</sup>Total number of REC sequences within the given rank, both in complete and incomplete genomes.

<sup>e</sup>Total number of REC domains within complete genomes only.

<sup>f</sup>Total number of complete genomes in the given rank.

<sup>g</sup>Total number of complete genomes that contain at least one REC sequence.

<sup>h</sup>Maximum number of REC sequences within a single complete genome in the given rank.

<sup>i</sup>Minimum number of REC sequences within a single complete genome in the given rank.

<sup>j</sup>Total number of ALR sequences within the given rank, both in complete and incomplete genomes.

<sup>k</sup>Total number of ALR domains only within complete genomes.

<sup>l</sup>Total number of complete genomes that contain at least one ALR sequence.

<sup>m</sup>Maximum number of ALR sequences within a complete genome in the given rank.

<sup>n</sup>Minimum number of ALR sequences within a complete genome in the given rank.

<sup>o</sup>The average number of ALRs per total number of complete genomes within a given rank.

<sup>p</sup>The average number of ALRs per number of complete genomes that contain at least one REC domain within a given rank.