

Table S2.) Reciprocal best blast recruitment of SAR202 single amplified genomes against reads from two metagenomic depth profiles. Note the highest levels of recruitment are from the deepest samples, indicating that these cells likely interact with chemical species found in most remote depths of the ocean.

| Cell Origin: |           |             | Recruitment (Total Reads Recruited / Percent of Reads Recruited / Average Percent Identity) |       |     |            |       |     |                     |       |     |            |       |     |                    |       |     |        |       |     |
|--------------|-----------|-------------|---------------------------------------------------------------------------------------------|-------|-----|------------|-------|-----|---------------------|-------|-----|------------|-------|-----|--------------------|-------|-----|--------|-------|-----|
|              |           |             | Hawaii Ocean Time Series                                                                    |       |     |            |       |     | South Atlantic Gyre |       |     |            |       |     | North Atlantic/OMZ |       |     | -      |       |     |
| Site         | Depth (m) | Total Reads | AAA240-O15                                                                                  |       |     | AAA240-N13 |       |     | AAA001-F05          |       |     | AAA007-M09 |       |     | AB-629-P13         |       |     | All    |       |     |
| MOCA         | 100       | 404,351     | 14                                                                                          | 0.00% | 88% | 9          | 0.00% | 87% | 6                   | 0.00% | 82% | 8          | 0.00% | 80% | 14                 | 0.00% | 94% | 51     | 0.01% | 86% |
|              | 776       | 555,373     | 1,202                                                                                       | 0.22% | 94% | 1,109      | 0.20% | 94% | 626                 | 0.11% | 93% | 476        | 0.09% | 92% | 77                 | 0.01% | 97% | 3,490  | 0.63% | 94% |
|              | 2750      | 579,381     | 1,381                                                                                       | 0.24% | 89% | 1,304      | 0.23% | 89% | 2,263               | 0.39% | 90% | 1,747      | 0.30% | 89% | 33                 | 0.01% | 94% | 6,728  | 1.16% | 90% |
|              | 5000      | 495,906     | 2,862                                                                                       | 0.58% | 93% | 2,616      | 0.53% | 93% | 2,461               | 0.50% | 93% | 1,872      | 0.38% | 93% | 72                 | 0.01% | 92% | 9,883  | 1.99% | 93% |
| <b>Total</b> | -         | 2,035,011   | 5,459                                                                                       | 0.26% | 91% | 5,038      | 0.24% | 91% | 5,356               | 0.25% | 90% | 4,103      | 0.19% | 89% | 196                | 0.01% | 94% | 20,152 | 0.95% | 91% |
| HOT          | 10        | 7,842       | 4                                                                                           | 0.05% | 86% | 3          | 0.04% | 82% | 6                   | 0.08% | 83% | 1          | 0.01% | 78% | 0                  | 0.00% | -   | 14     | 0.18% | 82% |
|              | 25        | 1,150,263   | 0                                                                                           | 0.00% | -   | 0          | 0.00% | -   | 0                   | 0.00% | -   | 0          | 0.00% | -   | 4                  | 0.00% | 91% | 4      | 0.00% | 91% |
|              | 70        | 10,999      | 0                                                                                           | 0.00% | -   | 0          | 0.00% | -   | 0                   | 0.00% | -   | 0          | 0.00% | -   | 0                  | 0.00% | -   | 0      | 0.00% | -   |
|              | 75        | 1,237,622   | 1                                                                                           | 0.00% | 83% | 5          | 0.00% | 91% | 0                   | 0.00% | -   | 0          | 0.00% | -   | 5                  | 0.00% | 87% | 11     | 0.00% | 87% |
|              | 110       | 473,166     | 0                                                                                           | 0.00% | -   | 0          | 0.00% | -   | 0                   | 0.00% | -   | 0          | 0.00% | -   | 6                  | 0.00% | 88% | 6      | 0.00% | 88% |
|              | 125       | 501,198     | 2                                                                                           | 0.00% | 87% | 0          | 0.00% | -   | 0                   | 0.00% | -   | 0          | 0.00% | -   | 10                 | 0.00% | 92% | 12     | 0.00% | 89% |
|              | 130       | 6,812       | 0                                                                                           | 0.00% | -   | 0          | 0.00% | -   | 0                   | 0.00% | -   | 0          | 0.00% | -   | 1                  | 0.01% | 94% | 1      | 0.01% | 94% |
|              | 200       | 8,286       | 11                                                                                          | 0.13% | 84% | 9          | 0.11% | 84% | 10                  | 0.12% | 83% | 4          | 0.05% | 81% | 0                  | 0.00% | -   | 34     | 0.41% | 83% |
|              | 500       | 1,537,785   | 4,654                                                                                       | 0.30% | 94% | 4,450      | 0.29% | 94% | 1,349               | 0.09% | 91% | 1,059      | 0.07% | 90% | 127                | 0.01% | 91% | 11,639 | 0.76% | 92% |
|              | 770       | 11,479      | 37                                                                                          | 0.32% | 92% | 51         | 0.44% | 91% | 33                  | 0.29% | 92% | 23         | 0.20% | 90% | 1                  | 0.01% | 87% | 145    | 1.26% | 90% |
| 4000         | 11,229    | 96          | 0.85%                                                                                       | 86%   | 94  | 0.84%      | 87%   | 132 | 1.18%               | 87%   | 104 | 0.93%      | 88%   | 1   | 0.01%              | 100%  | 427 | 3.80%  | 90%   |     |
| <b>Total</b> | -         | 4,956,681   | 4,805                                                                                       | 0.15% | 87% | 4,612      | 0.16% | 88% | 1,530               | 0.16% | 87% | 1,191      | 0.11% | 85% | 115                | 0.00% | 91% | 12,293 | 0.58% | 86% |