### Table S2: Similarity of 16S rRNA V4-V5 regions from representative AOA MAGs and top 20 *Thaumarchaeota* ASVs in 16S rRNA gene amplicons

| ASV/MAG | 16S rRNA | V4-V5 region | SFB_27_05 bin1 | SFB_3_bin18 |
|---------|-----------|--------------|----------------|--------------|
| 8       | 100       | 99.735       | 99.735         | 99.735       |
| SFB_27_05 bin1 | 100 | 99.735       | 99.735         | 99.735       |
| 754     | 99.735    | 99.735       | 99.735         | 99.735       |
| 1111    | 99.735    | 99.735       | 99.735         | 99.735       |
| 463     | 99.735    | 99.735       | 99.735         | 99.735       |
| 638     | 99.735    | 99.735       | 99.735         | 99.735       |
| 1347    | 99.735    | 99.735       | 99.735         | 99.735       |
| 1610    | 99.735    | 99.735       | 99.735         | 99.735       |
| SFB_3_bin18 | 99.735 | 99.735       | 99.735         | 99.735       |
| 1657    | 99.735    | 99.735       | 99.735         | 99.735       |
| 485     | 99.735    | 99.735       | 99.735         | 99.735       |
| 622     | 99.735    | 99.735       | 99.735         | 99.735       |
| 1467    | 99.735    | 99.735       | 99.735         | 99.735       |
| 1345    | 99.735    | 99.735       | 99.735         | 99.735       |
| 1193    | 99.735    | 99.735       | 99.735         | 99.735       |
| 522     | 99.735    | 99.735       | 99.735         | 99.735       |
| 1433    | 99.735    | 99.735       | 99.735         | 99.735       |
| 950     | 99.735    | 99.735       | 99.735         | 99.735       |
| 2193    | 99.735    | 99.735       | 99.735         | 99.735       |
| 979     | 99.735    | 99.735       | 99.735         | 99.735       |
| 1892    | 99.735    | 99.735       | 99.735         | 99.735       |
| 1181    | 99.735    | 99.735       | 99.735         | 99.735       |