**Table S3:** Taxonomy-guided query used for real AMD metagenome. Direct repeats were obtained from CRISPRdb tables of CRISPRs detected in the listed microbial genomes. The *Leptospirillum* sp. Group IV 'UBA BS' direct repeat was detected in the listed assembly using CRISPRFinder and was not found in CRISPRdb.

|  |  |  |
| --- | --- | --- |
| Taxon | Accession number  | Query sequence  |
| *Ferroplasma acidarmanus* fer1 | NC\_021592.1(GenBank) | ATTTCAATTCCTATATGGAATTATTTTAAC |
| *Ferroplasma acidarmanus* fer1 | NC\_021592.1(GenBank) | GTGTTTAGTCTATCTATAAGGGTTTGAAAT |
| *Leptospirillum* sp. Group II 'CF-1' | NZ\_CP012147.1(GenBank) | GTATTCCCCACGTTCGTGGGGATGAACCG |
| *Leptospirillum* sp. Group IV 'UBA BS' | GCA\_000496115.1 (Assembly) | GTTTTCCCCGCATGCGCGGGGGTGTTTCT |