**Table S1**. Identity and ADS activity levels of plaque bacterial strains [Huang et al., 2015].

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **STUDY CODE** | **ACCESSION NUMBER** | **HOT no.✚** | **cLOSEST RELATIVE** | **SOURCE** | **ADS ACTIVITY****(Mean ±SD)** |
|  |  |  | *Streptococcus gordonii* DL1 | Lab strain | 339.3±33.0 |
|  |  |  | *arcA-*deficient strains of *S. gordonii* | Lab strain | 0 |
| *Streptococcus parasanguinis* A1 | KF733681.1 | 721 | *Streptococcus parasanguinis* ChDC B356 | CF | 688.0±57.1\* |
| *Streptococcus intermedius* A2 | KF733728.1 | 644 | *Streptococcus intermedius*  ChDC B589 | CF | 390.1±17.3\* |
| *Streptococcus intermedius* A3 | KF733728.1 | 644 | *Streptococcus intermedius* ChDC B589 | CF | 476.9±43.8\* |
| *Streptococcus intermedius* A4 | KF733728.1 | 644 | *Streptococcus intermedius* ChDC B589 | CF | 233.1±15.7 |
| *Streptococcus intermedius* A5 | KF733728.1 | 644 | *Streptococcus intermedius*  ChDC B589 | CF | 252.85±61.79 |
| *Streptococcus intermedius* A6 | KF733728.1 | 644 | *Streptococcus intermedius*  ChDC B589 | CF | 237.5±11.5 |
| *Streptococcus gordonii* A7 | CP000725.1 | 622 | *Streptococcus gordonii* str. Challis substr. CH1 | CA | 283.3±5.2 |
| *Streptococcus gordonii* A8 | NR\_074516.1 | 622 | *Streptococcus gordonii* str. Challis substr. CH1 | CF | 431.9±15.4\* |
| *Streptococcus gordonii* A9 | NR\_115242.1 | 622 | *Streptococcus gordonii* ATCC 10558 | CA | 244.8±10.7 |
| *Streptococcus gordonii* A10 | NR\_115242.1 | 622 | *Streptococcus gordonii* ATCC 10558 | CA | 241.3±15.9 |
| *Streptococcus gordonii* A11 | NR\_115242.1 | 622 | *Streptococcus gordonii* ATCC 10558 | CF | 354.8±20.9\* |
| *Streptococcus australis* A12 | NR\_036936.1 | 073 | *Streptococcus australis* AI-1★ | CF | 309.2±1.4 |
| *Streptococcus australis* A13 | NR\_036936.1 | 073 | *Streptococcus australis* AI-1★ | CF | 287.3±12.7 |
| *Streptococcus sanguinis* A14 | CP000387.1 | 758 | *Streptococcus sanguinis* SK36 | CF | 129.0±5.6 |
| *Streptococcus sanguinis* A15 | CP000387.1 | 758 | *Streptococcus sanguinis* SK36 | CF | 119.7±3.7 |
| *Streptococcus sanguinis* A16 | CP000387.1 | 758 | *Streptococcus sanguinis* SK36 | CF | 129.1±10.4 |
| *Streptococcus sanguinis* A17 | CP000387.1 | 758 | *Streptococcus sanguinis* SK36 | CF | 94.1±4.3 |
| *Streptococcus sanguinis* A18 | CP000387.1 | 758 | *Streptococcus sanguinis* SK36 | CF | 107.1±9.1 |
| *Streptococcus sanguinis* A19 | CP000387.1 | 758 | *Streptococcus sanguinis* SK36 | CF | 98.0±5.7 |
| *Streptococcus sanguinis* A20 | CP000387.1 | 758 | *Streptococcus sanguinis* SK36 | CF | 93.1±1.4 |
| *Streptococcus sanguinis* A21 | CP000387.1 | 758 | *Streptococcus sanguinis* SK36 | CF | 116.8±14.0 |
| *Streptococcus sanguinis* A22 | CP000387.1 | 758 | *Streptococcus sanguinis* SK36 | CF | 88.9±10.0 |
| *Streptococcus sanguinis* A23 | NR\_113260.1 | 758 | *Streptococcus sanguinis* SK1284\_K2-1 | CA | 127.6±1.1 |
| *Streptococcus sanguinis* A24 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 45.2±6.0 |
| *Streptococcus sanguinis* A25 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 50.2±3.4 |
| *Streptococcus sanguinis*  A26 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 46.0±0.3 |
| *Streptococcus sanguinis* A27 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 63.4±0.0 |
| *Streptococcus sanguinis* A28 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 56.4±13.0 |
| *Streptococcus sanguinis* A29 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 187.1±20.3 |
| *Streptococcus sanguinis* A30 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 173.3±4.0 |
| *Streptococcus sanguinis* A31 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 246.2±2.4 |
| *Streptococcus sanguinis* A32 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 227.3±0.0 |
| *Streptococcus sanguinis* A33 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 199.2±8.3 |
| *Streptococcus sanguinis* A34 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 200.6±14.6 |
| *Streptococcus sanguinis* A35 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 201.9±15.2 |
| *Streptococcus sanguinis* A36 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 263.4±29.9 |
| *Streptococcus sanguinis* A37 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 227.9±89.7 |
| *Streptococcus sanguinis* A38 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 167.7±9.9 |
| *Streptococcus sanguinis* A39 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 198.1±5.1 |
| *Streptococcus sanguinis* A40 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 212.5±0.6 |
| *Streptococcus sanguinis* A41 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 144.0±10.0 |
| *Streptococcus sanguinis* A42 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 190.1±10.6 |
| *Streptococcus sanguinis* A43 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 106.4±4.0 |
| *Streptococcus sanguinis* A44 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CF | 104.3±4.1 |
| *Streptococcus sanguinis* A45 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CA | 161.3±3.3 |
| *Streptococcus sanguinis* A46 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CA | 169.8±6.4 |
| *Streptococcus sanguinis* A47 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CA | 221.3±4.8 |
| *Streptococcus sanguinis* A48 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CA | 136.9±4.3 |
| *Streptococcus sanguinis* A49 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CA | 238.2±31.1 |
| *Streptococcus sanguinis* A50 | NR\_113260.1 | 758 | *Streptococcus sanguinis* JCM 5708 | CA | 182.0±39.3 |
| *Streptococcus sanguinis* A51 | KF733682.1 | 758 | *Streptococcus sanguinis*  ChDC B357 | CF | 250.8±1.3 |
| *Streptococcus cristatus* A52 | NR\_115274.1 | 578 | *Streptococcus cristatus* ATCC 51100 | CA | 187.5±41.4 |
| *Streptococcus cristatus* A53 | NR\_115274.1 | 578 | *Streptococcus cristatus* ATCC 51100 | CA | 129.2±31.6 |
| *Streptococcus cristatus* A54 | GU470899.1 | 578 | *Streptococcus cristatus* F0329 | CA | 160.0±26.2 |
| *Streptococcus cristatus* A55 | GU470899.1 | 578 | *Streptococcus cristatus* F0329 | CA | 159.0±9.1 |
| *Streptococcus cristatus* A56 | GU470899.1 | 578 | *Streptococcus cristatus* F0329 | CA | 185.9±41.8 |
| The 56 ADS-positive strains identified had greater than 99% sequence similarity with their assigned bacterial taxa, as derived from their database accession numbers. HOT = Human oral taxon ID from the Human Oral Microbiome Database. ADS activity was expressed as nanomoles of citrulline generated perminute per milligram of protein. An asterisk (\*) indicates that the bacterial strain expressed higher ADS activity than *S. gordonii* DL1. SD = Standard deviation.1 The closest relative strains to *S. gordonii* A7 are *Streptococcus* sp. JCM 5703 and *S. gordonii* strain Challis substrain CH1.2 The closest relative strains to *S. australis* A12 and A13 are *S. australis* AI-1, but also *Streptococcus rubneri* LMG 27207 (accession No.: NR\_109720.1). Because A12 and A13 were collected from dental plaque and are ADS-positive, whereas the *S. rubneri* strain in the database is an ADS-negative throat isolate, A12 and A13 will be considered herein as strains of *S. australis*.  |



**Figure S1.** Growth inhibition of arginolytic strains on *S. mutans* UA159 using gradient BHI plates. Arginolytic strains were spotted first, and *S. mutans* was spotted 24 hr later.



**Figure S2.** Growth inhibition of arginolytic strains on *S. mutans* UA159 using gradient TY-25mM galactose plates. Arginolytic strains were spotted first, and *S. mutans* was spotted 24 h later.