# Supplementary Materials

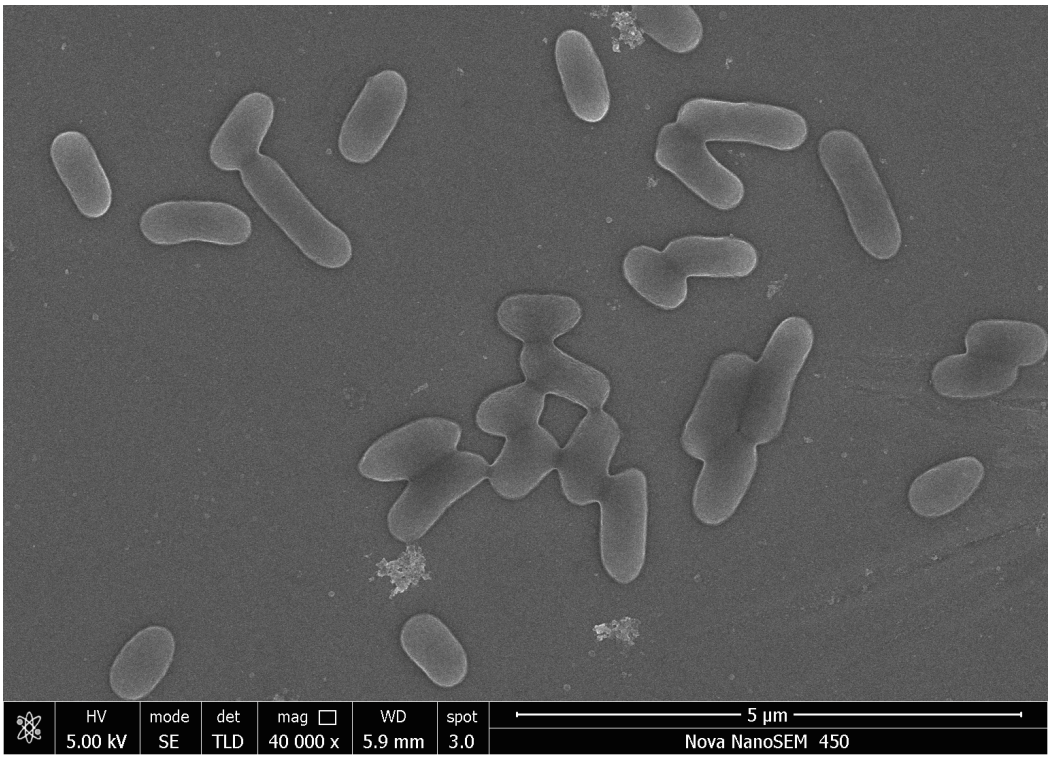
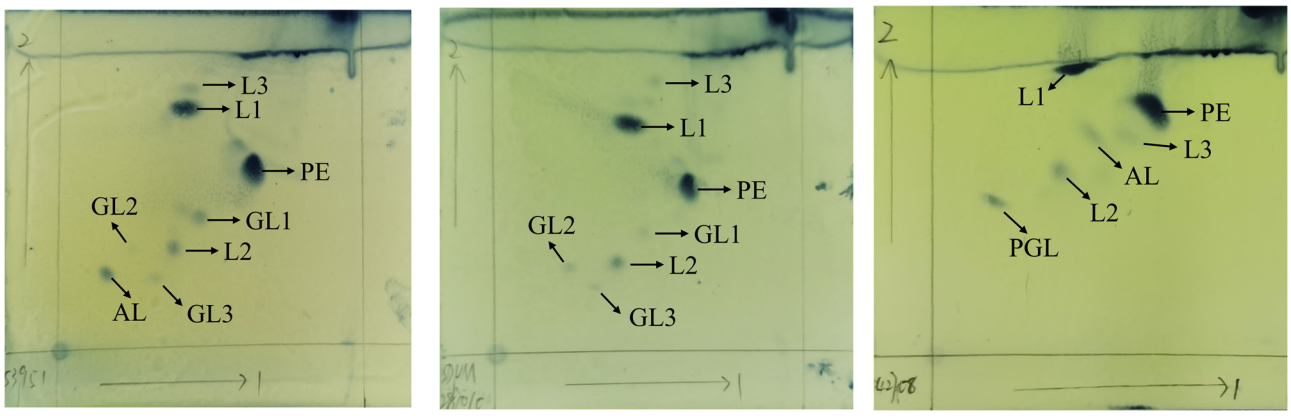



**Figure S1.** Scanning electron micrograph of cells of strain SDUM287046$^{T}$. Bar, 5 µm.




(a) (b) (c)

**Figure S2.** Two-dimensional TLC plate image of the total polar lipids of strain SDUM287046$^{T}$ **(a)**, *A. antarctica* DSM 14231$^{T}$ **(b)** and *A. aquimaris* KCTC 42708$^{T}$ **(c)**. PE, phosphatidylethanolamine; PGL, phosphoglycolipid; AL, unidentified aminolipid; GL, unidentified glycolipid; L, unidentified lipid.

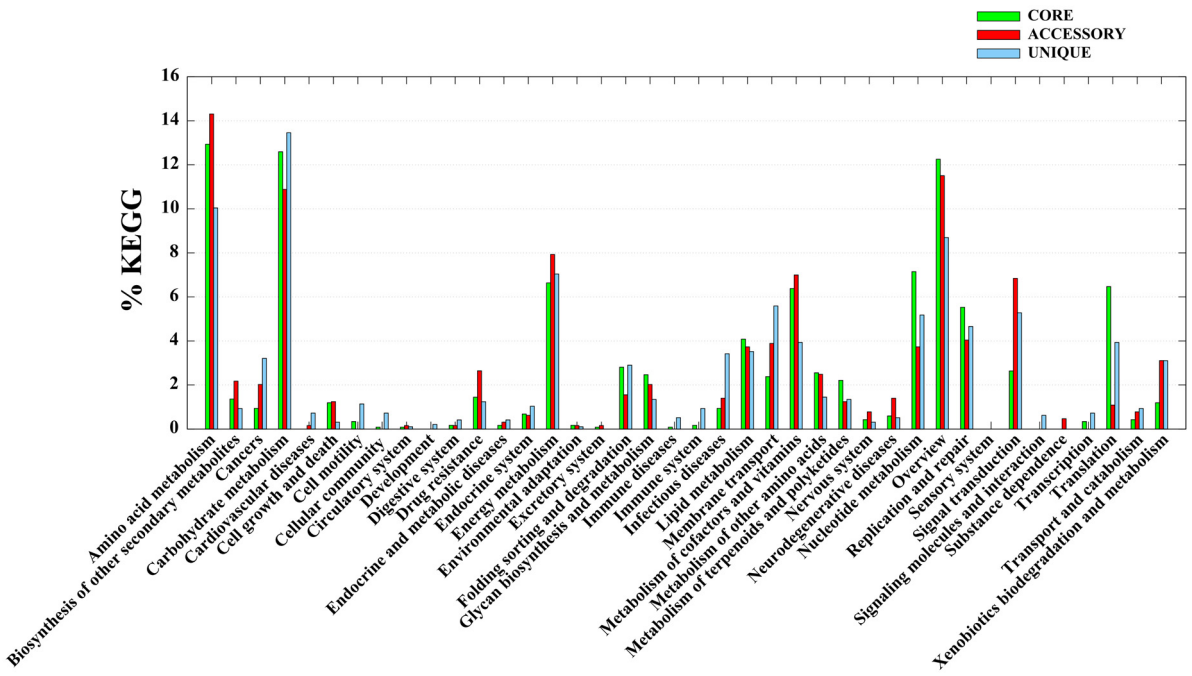



**Figure S3.** The distribution of core genes, accessory genes and unique genes to different metabolic pathways in the genus *Aequorivita*.

**Table S1.** Cellular fatty acids composition (%) of the strain SDUM287046$^T$ and experimental strains.

| **Fatty acid** | **1** | **2** | **3** |
|---|---|---|---|
| *Saturated* | | | |
| $C_{16:0}$ | 1.5 | 1.1 | 1.2 |
| *Branched* | | | |
| iso-$C_{14:0}$ | TR | 2.2 | TR |
| iso-$C_{15:0}$ | **30.2** | **36.8** | **34.2** |
| anteiso-$C_{15:0}$ | **17.2** | 7.6 | 7.4 |
| iso-$C_{15:1}$ G | 2.5 | 7.2 | 8.1 |
| iso-$C_{16:0}$ | 1.2 | TR | TR |
| *Hydroxy* | | | |
| iso-$C_{15:0}$ 3–OH | 1.8 | 3.1 | 3.8 |
| $C_{15:0}$ 2–OH | 1.4 | TR | TR |
| iso-$C_{16:0}$ 3–OH | 1.8 | TR | 1.4 |
| iso-$C_{17:0}$ 3–OH | **14.9** | **20.0** | **21.6** |
| $C_{17:0}$ 2–OH | 5.0 | 1.0 | 1.2 |
| *Summed Feature* | | | |
| Summed Feature 3* | 5.0 | 6.1 | 3.6 |
| Summed Feature 9* | **11.6** | 9.7 | **11.1** |

Strains: 1, SDUM287046$^T$; 2, *A. aquimaris* KCTC 42708$^T$; 3, *A. antarctica* DSM 14231$^T$. All data listed in the table are from this study. TR, trace (<1.0%); Fatty acids present at >10% are indicated in bold.

*Summed features are groups of two or three fatty acids that cannot be separated by GLC using the MIDI system. Summed feature 3 consists of $C_{16:1}$ ω7c and/or $C_{16:1}$ ω6c and summed feature 9 consists of iso-$C_{17:1}$ ω9c and/or $C_{16:0}$ 10-methyl.

**Table S2.** Genomic dataset of the strains analyzed in the pan-genome analysis.

| Strains | Genome size | GC content (%) | Accession number |
|---|---|---|---|
| strain SDUM287046$^{T}$ | 3,093,921 | 39.3 | JAUGQQ000000000 |
| *Aequorivita antarctica* SW49$^{T}$ | 3,844,651 | 37.2 | GCA_007997155 |
| *Aequorivita aquimaris* D-24$^{T}$ | 3,147,268 | 40.0 | GCA_001573155 |
| *Aequorivita capsosiphonis* DSM 23843$^{T}$ | 4,042,904 | 36.9 | GCA_000429125 |
| *Aequorivita echinoideorum* JCM30378$^{T}$ | 2,929,928 | 38.7 | GCA_018476645 |
| *Aequorivita iocasae* KX20305$^{T}$ | 3,353,883 | 38.7 | GCA_016757735 |
| *Aequorivita lipolytica* CIP107455$^{T}$ | 3,305,581 | 37.7 | GCA_900489485 |
| *Aequorivita lutea* q18$^{T}$ | 3,369,026 | 42.8 | GCA_009668655 |
| *Aequorivita sinensis* S1-10$^{T}$ | 3,181,804 | 34.6 | GCA_006346335 |
| *Aequorivita soesokkakensis* RSSK-12$^{T}$ | 3,190,776 | 37.9 | GCA_001641085 |
| *Aequorivita sublithincola* DSM 14238$^{T}$ | 3,520,671 | 36.2 | GCA_000265385 |
| *Aequorivita todarodis* KCTC 62141$^{T}$ | 3,331,876 | 41.1 | GCA_028561335 |
| *Aequorivita viscosa* DSM 26349$^{T}$ | 3,526,892 | 36.6 | GCA_900141955 |
| *Aequorivita vitellina* F47161$^{T}$ | 3,633,834 | 37.4 | GCA_022008365 |
| *Aequorivita vladivostokensis* KMM 3516$^{T}$ | 3,269,452 | 40.8 | GCA_000952855 |
| *Aequorivita xiaoshiensis* F64183$^{T}$ | 3,066,048 | 34.5 | GCA_022008395 |