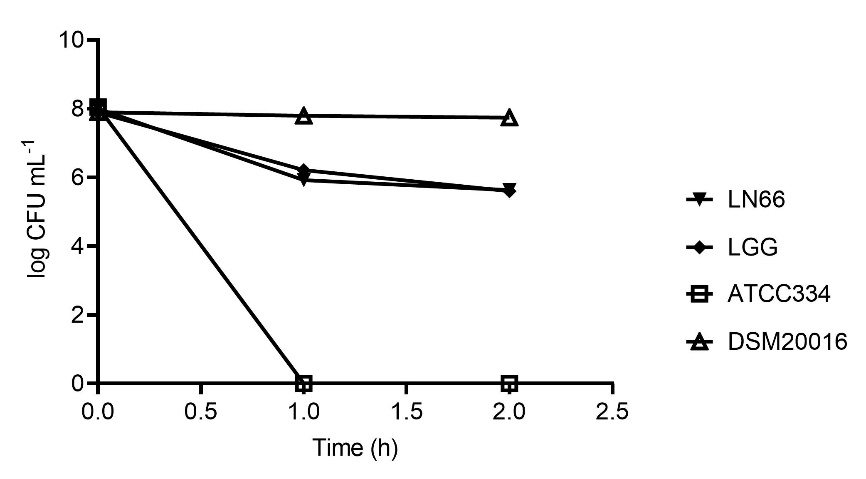
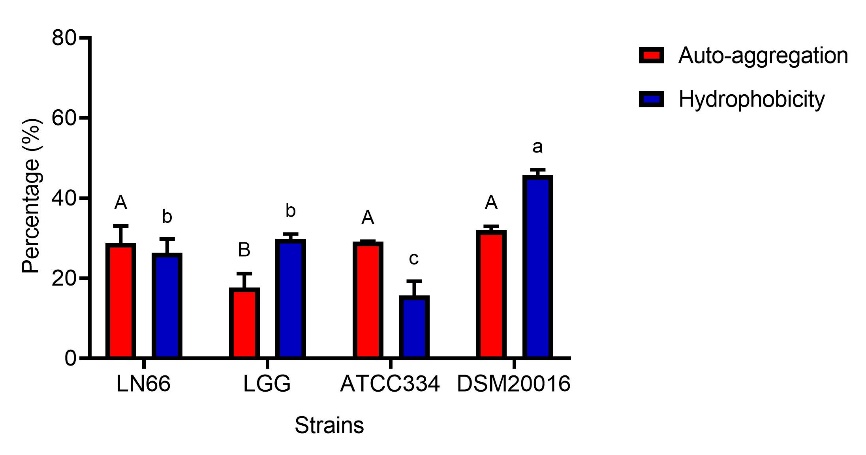


Supplementary Figure S1 Phylogenetic relationship of LN66 based on maximum likelihood analysis of the 16S rRNA gene, the evolutionary distances are calculated using the Tamura-Nei model. The scale bar represents 2-nucleotide substitutes per position.



Supplementary Figure S2 Survival of LAB strains after 2 hours in pH 2.0 simulated gastric acid. Experimental data are expressed as mean ± standard deviation (n=3), and groups marked with different superscript letters indicate statistically significant differences (P ＜ 0.05).



Supplementary Figure S3 Auto-aggregation and hydrophobicity ability of four LAB strains. Experimental data are expressed as mean ± standard deviation (n=3), and groups marked with different superscript letters indicate statistically significant differences (P ＜ 0.05).

Supplementary Table S1 Antagonistic abilities of LN66 CFS against five pathogens. Experimental data are expressed as mean ± standard deviation (n=3), and groups marked with different superscript letters indicate statistically significant differences (P ＜ 0.05).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Average ZOI (mm) | | | | |
| *H. pylori* | *E. coli* | *S. aureus* | *S. sonnei* | *S. tyhimurium* |
| LN66 | 7.2±0.3a | 7.5±0.1a | 9.4±0.5a | 8.2±0.2a | 7.4±0.1a |
| LGG | 4.6±0.2b | 7.2±0.1a | 8.6±0.3ab | 7.6±0.1b | 7.4±0.2a |
| ATCC334 | 1.9±0.3d | 7.3±0.1a | 8.0±0.1b | 7.7±0.1b | 7.5±0.1a |
| DSM20016 | 3.5±0.4c | 7.3±0.2a | 8.3±0.2b | 7.8±0.3b | 7.8±0.3a |
| MRS | 0e | 0b | 0c | 0c | 0b |

Supplementary Table S2 Protein, polysaccharide content and pH of LN66 CFS. Experimental data are expressed as mean ± standard deviation (n=3), and groups marked with different superscript letters indicate statistically significant differences (P ＜ 0.05).

|  |  |  |  |
| --- | --- | --- | --- |
| LAB strain | Protein content (μg/mL) | Polysaccharide (mg/mL) | pH |
| LN66 | 133.02±0.75d | 17.01±4.11b | 3.49±0.02c |
| LGG | 138.31±0.87bc | 22.38±6.47b | 3.85±0.02b |
| ATCC334 | 136.08±0.35c | 35.90±3.46a | 3.83±0.01b |
| DSM20016 | 139.48±0.17b | 15.49±0.79b | 3.82±0.02b |
| MRS | 144.99±1.53a | 35.74±0.98a | 5.88±0.02a |