

Draft Genome Sequence of Probiotic *Lactobacillus acidophilus* Strain L-55 Isolated from a Healthy Human Gut

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Probiotic *Lactobacillus acidophilus* L-55 was isolated from a healthy human gut. Here, we report the draft genome sequence of this organism.

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Lactobacillus acidophilus, which is a Gram-positive bacterium, is often used in dairy products as a probiotic lactic acid bacterium that benefits the health of the host (1, 2). *L. acidophilus* strain L-55, which was isolated from healthy infant feces (3, 4), has tolerance to gastrointestinal conditions and a high ability to adhere to Caco-2 cells (3, 4), and it has been used as a starter culture for commercial dairy products (3). It has also been reported that *L. acidophilus* L-55 has the effect of alleviating the symptoms of allergic rhinitis (3, 5) and atopic dermatitis (4).

The *L. acidophilus* L-55 genome was paired-end sequenced using Illumina's MiSeq platform. Genomic libraries containing 600- to 1,000-bp inserts were constructed and sequenced, yielding 1,981,953 reads that provided 296-fold coverage of the genome. The sequence reads were assembled using the CLC Genomics Workbench version 9.0.1, and the assembled genome consists of 25 contigs with a total length of 2,009,507 bp. The genome has a G+C content of 34.6%. These features were very similar to those of 15 other sequenced *L. acidophilus* strains, except strain CFH, consistent with a previous report that *L. acidophilus* lacks genomic diversity compared to other *L. acidophilus* group species (6). The draft genome of *L. acidophilus* L-55 contained 1,884 predicted protein-coding genes, 1,760 (93%) of which were shared with the complete genome sequence of *L. acidophilus* NCFM (7). The genome information of this species will be useful for further studies of its physiology, taxonomy, and ecology.

Accession number(s). The draft genome sequence for *L. acidophilus* L-55 has been deposited in the DDBJ/GenBank/EMBL database under accession numbers [BDHM01000001](https://www.ncbi.nlm.nih.gov/nuccore/BDHM01000001) to [BDHM01000025](https://www.ncbi.nlm.nih.gov/nuccore/BDHM01000025).

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REFERENCES

1. Ringel-Kulka T, Goldsmith JR, Carroll IM, Barros SP, Palsson O, Jobin C, Ringel Y. 2014. *Lactobacillus acidophilus* NCFM affects colonic mucosal opioid receptor expression in patients with functional abdominal pain - a randomised clinical study *Aliment Pharmacol Ther* 40:200–207. <http://dx.doi.org/10.1111/apt.12800>.
2. Sinn DH, Song JH, Kim HJ, Lee JH, Son HJ, Chang DK, Kim YH, Kim JJ, Rhee JC, Rhee PL. 2008. Therapeutic effect of *Lactobacillus acidophilus*-SDC 2012, 2013 in patients with irritable bowel syndrome. *Dig Dis Sci* 53:2714–2718. <http://dx.doi.org/10.1007/s10620-007-0196-4>.
3. Sunada Y, Nakamura S, Kamei C. 2007. Effects of *Lactobacillus acidophilus* strain L-55 on experimental allergic rhinitis in BALB/c mice. *Biol Pharm Bull* 30:2163–2166. <http://dx.doi.org/10.1248/bpb.30.2163>.
4. Sunada Y, Nakamura S, Kamei C. 2008. Effect of *Lactobacillus acidophilus* strain L-55 on the development of atopic dermatitis-like skin lesions in NC/Nga mice. *Int Immunopharmacol* 8:1761–1766. <http://dx.doi.org/10.1016/j.intimp.2008.08.011>.
5. Kimura G, Akagi H, Okada C, Hirano A, Amano Y, Ohmura E, Nakashige Y, Sunada Y, Fujii Y, Nakamura S, Soda R, Takahashi K. 2012. Clinical effects of *Lactobacillus acidophilus* strain L-55-contained yogurt on symptoms of Japanese cedar pollen allergy. *Arerugi* 61: 628–641.
6. Bull MJ, Jolley KA, Bray JE, Aerts M, Vandamme P, Maiden MC, Marchesi JR, Mahenthiralingam E. 2014. The domestication of the probiotic bacterium *Lactobacillus acidophilus*. *Sci Rep* 4:7202. <http://dx.doi.org/10.1038/srep07202>.
7. Altermann E, Russell WM, Azcarate-Peril MA, Barrangou R, Buck BL, McAuliffe O, Souther N, Dobson A, Duong T, Callanan M, Lick S, Hamrick A, Cano R, Klaenhammer TR. 2005. Complete genome sequence of the probiotic lactic acid bacterium *Lactobacillus acidophilus* NCFM. *Proc Natl Acad Sci U S A* 102:3906–3912. <http://dx.doi.org/10.1073/pnas.0409188102>.