PROKARYOTES



Draft Genome Sequences of Three Listeria monocytogenes Isolates from Foods in China

Xudong Su,^a Guojie Cao,^b Dai Kuang,^a Jianmin Zhang,^c Yi Chen,^b Marc Allard,^b Eric Brown,^b Xianming Shi,^a Jianghong Meng,^{a,d} Xuebin Xu^e

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Department of Food Science & Technology, Shanghai Jiao Tong University, Shanghai, China^a; Center for Food Safety and Applied Nutrition, Food and Drug Administration, College Park, Maryland, USA^b; College of Veterinary Medicine, South China Agricultural University, Guangzhou, China^c; Department of Nutrition and Food Science, University of Maryland, College Park, Maryland, USA^d; Shanghai Municipal Center for Disease Control and Prevention, Shanghai, China^e

ABSTRACT Listeria monocytogenes is a foodborne pathogen of global concern because of the high mortality rate among patients. The draft genome sequences of three *L. monocytogenes* strains isolated from foods are reported here. The availability of these genomes should provide useful information on the genomic diversity of *L. monocytogenes* isolated from foods in China.

Listeria monocytogenes is an important foodborne pathogen causing severe illness, such as septicemia and meningitis, among pregnant women, elderly people, and immunocompromised individuals (1, 2). *L. monocytogenes* is ubiquitous and has been reportedly isolated from a wide range of foods, including meat, poultry, dairy products, fruit, and vegetables (3, 4). Whole-genome sequencing has become an essential tool for investigating the evolution, diversity, and pathogenicity of foodborne bacterial pathogens (5–9). The draft genome sequences of three *L. monocytogenes* strains from foods in the Shanghai area of China are reported here.

Genomic DNA was isolated from overnight cultures and sequenced using MiSeq (Illumina, San Diego, CA) to obtain draft genomes. Genomic data were assembled using SOAP*denovo* version 2 (10), including the serotype 1/2c strain SHL12-2 (16 contigs, 3.01 Mb, 583,457 bp N_{50} contig size, and 2,978 identified genes), serotype 1/2a strain SHL12-22 (20 contigs, 3.02 Mb, 506,776 bp N_{50} contig size, and 2,943 identified genes), and serotype 1/2a strain SHL13-12 (17 contigs, 2.99 Mb, 524,215 bp N_{50} contig size, and 2,884 identified genes). These sequences were annotated using the NCBI Prokaryotic Genome Annotation Pipeline (11).

Accession number(s). These three draft genome sequences have been deposited in GenBank under the accession numbers LRTW00000000, LRTX00000000, and LRTY00000000.

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REFERENCES

 Chen Y, Burall LS, Luo Y, Timme R, Melka D, Muruvanda T, Payne J, Wang C, Kastanis G, Maounounen-Laasri A, De Jesus AJ, Curry PE, Stones R, K'Aluoch O, Liu E, Salter M, Hammack TS, Evans PS, Parish M, Allard MW, Datta A, Strain EA, Brown EW. 2016. *Listeria monocytogenes* in stone Received 23 February 2017 Accepted 24 February 2017 Published 20 April 2017

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Address correspondence to Xuebin Xu, xxb72@sina.com.

fruits linked to a multistate outbreak: enumeration of cells and wholegenome sequencing. Appl Environ Microbiol 82:7030–7040. https://doi .org/10.1128/AEM.01486-16.

2. Cossart P. 2011. Illuminating the landscape of host-pathogen interac-

tions with the bacterium *Listeria monocytogenes*. Proc Natl Acad Sci USA 108:19484-19491. https://doi.org/10.1073/pnas.1112371108.

- Rückerl I, Muhterem-Uyar M, Muri-Klinger S, Wagner KH, Wagner M, Stessl B. 2014. L. monocytogenes in a cheese processing facility: learning from contamination scenarios over three years of sampling. Int J Food Microbiol 189:98–105. https://doi.org/10.1016/j.ijfoodmicro.2014.08.001.
- Zhang Y, Yeh E, Hall G, Cripe J, Bhagwat AA, Meng J. 2007. Characterization of *Listeria monocytogenes* isolated from retail foods. Int J Food Microbiol 113:47–53. https://doi.org/10.1016/j.ijfoodmicro.2006.07.010.
- Cao G, Allard M, Strain E, Stones R, Zhao S, Brown E, Meng J. 2014. Genetic diversity of *Salmonella* pathogenicity islands SPI-5 and SPI-6 in *Salmonella* Newport. Foodborne Pathog Dis 11:798–807. https://doi .org/10.1089/fpd.2014.1784.
- Cao G, Meng J, Strain E, Stones R, Pettengill J, Zhao S, McDermott P, Brown E, Allard M. 2013. Phylogenetics and differentiation of *Salmonella* Newport lineages by whole genome sequencing. PLoS One 8:e55687. https://doi.org/10.1371/journal.pone.0055687.
- 7. Ju W, Cao G, Rump L, Strain E, Luo Y, Timme R, Allard M, Zhao S, Brown E, Meng J. 2012. Phylogenetic analysis of non-O157 Shiga toxin-

producing *Escherichia coli* strains by whole-genome sequencing. J Clin Microbiol 50:4123-4127. https://doi.org/10.1128/JCM.02262-12.

- Lienau EK, Strain E, Wang C, Zheng J, Ottesen AR, Keys CE, Hammack TS, Musser SM, Brown EW, Allard MW, Cao G, Meng J, Stones R. 2011. Identification of a salmonellosis outbreak by means of molecular sequencing. N Engl J Med 364:981–982. https://doi.org/10.1056/NEJMc1100443.
- Zhang J, Cao G, Xu X, Allard M, Li P, Brown E, Yang X, Pan H, Meng J. 2016. Evolution and diversity of *Listeria monocytogenes* from clinical and food samples in Shanghai, China. Front Microbiol 7:1138. https://doi.org/ 10.3389/fmicb.2016.01138.
- Luo R, Liu B, Xie Y, Li Z, Huang W, Yuan J, He G, Chen Y, Pan Q, Liu Y, Tang J, Wu G, Zhang H, Shi Y, Liu Y, Yu C, Wang B, Lu Y, Han C, Cheung DW, Yiu SM, Peng S, Xiaoqian Z, Liu G, Liao X, Li Y, Yang H, Wang J, Lam TW, Wang J. 2012. SOAP*denovo2*: an empirically improved memoryefficient short-read *de novo* assembler. GigaScience 1:18. https://doi.org/ 10.1186/2047-217X-1-18.
- Tatusova T, DiCuccio M, Badretdin A, Chetvernin V, Nawrocki EP, Zaslavsky L, Lomsadze A, Pruitt KD, Borodovsky M, Ostell J. 2016. NCBI prokaryotic genome annotation pipeline. Nucleic Acids Res 44:6614-24. https://doi.org/10.1093/nar/gkw569.