Genome Sequence of a Clinical Staphylococcus aureus Strain from a Prosthetic Joint Infection

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Here, we report the genome sequence of Staphylococcus aureus LYO-S2, an isolate with sequence type (ST) 45 that was isolated in 2001 from a prosthetic joint infection.

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Staphylococcus aureus is a Gram-positive ubiquitous bacterial species that is considered to be an important pathogen that causes hospital- and community-acquired infective diseases. The resulting infections are difficult to treat because of frequent resistance to commonly used antibiotics and the ability of the strains to form biofilms (1, 2).

Here, we report the genome sequence of S. aureus strain LYO-S2, isolated in 2001 from a patient suffering from a prosthetic joint infection after total knee arthroplasty in the public hospital of Lyon, France. The strain belongs to multilocus sequence type 45 (3) and is methicillin-susceptible.

The genomic DNA from LYO-S2 was sequenced by next-generation sequencing using an Illumina HiSeq 2500 instrument with 125-bp paired-end reads. The genome was assembled by SOAPdenovo2 v1.03 software (4), resulting in 50,307,694 reads with an average length of 125 pb, which assembled into 24 scaffolds ranging from 141 bp to 1,275,288 bp, and resulted in a total genomic length of 2,681,263 nt. The G+C content was 32.71%. The open reading frames (ORFs) were obtained by the software MyRast and were annotated by the Figfams database (5). Genome annotation resulted in 2,538 annotated genes, including 278 hypothetical proteins and 55 tRNAs.

The LYO-S2 genome contains the ica operon (for the synthesis of extracellular poly-N-acetyl-glucosamine), accessory gene regulator (agrB and D), elastin-binding adhesins (ebpS), fibronectin (fnbA and B), and collagen (cna), and multiple genes encoding staphylococcal enterotoxins, exotoxins, and superantigens.

Genes involved in resistance to antibiotics such as methicillin-resistance proteins (fmeA and B, hmra, and femC), multidrug-resistance protein B, drug-resistance transporter (emrB/qacA subfamily), teloiplacin resistance-associated membrane proteins (tcaA, B, and R), quinolone-resistance protein (norA), and chloramphenicol-resistance protein were also found. Moreover, some genes coding for resistance to metals such as cobalt-, zinc-, cadmium-, and aluminum-resistance proteins were identified, as well as genes encoding toxic anion- and glyoxalase/bleomycin-resistant proteins.

Nucleotide sequence accession numbers. This whole-genome shotgun project has been deposited at DDBJ/EMBL/GenBank under the accession numbers FCOV01000001 to FCOV01000024. The study identification number is PRJEB12461.

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