

***Paenibacillus macerans*, Strain NRS 888**

Catalog No. NR-52258

(Derived from ATCC® 8244™)

Product Description:

Paenibacillus macerans (*P. macerans*), strain NRS 888 was originally isolated by B. W. Hammer in 1915 and deposited at ATCC® in 1961 by Dr. N. R. Smith. NR-52258 lot 70033088 was produced by inoculation of ATCC® 8244™ lot 3841708 into Nutrient broth and grown for 2 days at 30°C in an aerobic atmosphere. Broth inoculum was added to Nutrient agar kolles, which were grown for 2 days at 30°C in an aerobic atmosphere to produce this lot. Quality control testing was completed under propagation conditions unless otherwise noted.

Lot: 70033088

Manufacturing Date: 14FEB2020

BEI Resources is committed to ensuring digital accessibility for people with disabilities. This Certificate of Analysis contains complex tables and may not be fully accessible. Please let us know if you encounter accessibility barriers and a fully accessible document will be provided: E-mail: Contact@BEIResources.org. We try to respond to feedback within 24 hours.

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis Cellular morphology Colony morphologies ² Hemolysis 2 day at 37°C in an aerobic atmosphere on Tryptic Soy agar with 5% defibrinated sheep blood Motility (wet mount) Biochemical tests Catalase VITEK® MS (MALDI-TOF)	Gram-positive rods Report results Report results Report results Report results <i>P. macerans</i>	Gram-positive rods ¹ Colony type 1: Circular, raised, undulate and translucent (Figure 1) Colony type 2: Circular, convex, entire, smooth and cream (Figure 1) Non-hemolytic Motile Negative <i>P. macerans</i> (99.9%)
Genotypic Analysis Sequencing of 16S ribosomal RNA gene (~ 1520 base pairs) Digital DNA-DNA hybridization (dDDH) ³	≥ 99% sequence identity to <i>P. macerans</i> , strain NRS 888 (GenBank: JMQA01000002.1) ≥ 70% for species identification	99.3% sequence identity to <i>P. macerans</i> , strain NRS 888 (GenBank: JMQA01000002.1) <i>P. thermophilus</i> (95.7%) ^{4,5}
Purity (post-freeze) 7 days at 37°C in an aerobic atmosphere with 5% CO ₂ on Tryptic Soy agar with 5% defibrinated sheep blood	Growth consistent with expected colony morphology	Growth consistent with expected colony morphology
Viability (post-freeze)	Growth	Growth

¹Gram-negative rods were also observed. While *Paenibacillus* sp. have a Gram-positive cell wall, they can stain Gram-negative and Gram-variable. For more information, refer to Grady, E. N., et al. "Current Knowledge and Perspectives of *Paenibacillus*: A Review." *Microb. Cell Fact.* 15 (2016): 203. PubMed: 27905924.

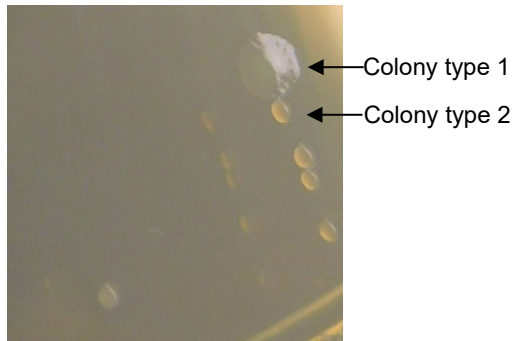
²Two colony types were observed. Plating of the individual colony types showed that they did not revert to the mixed colony type. The 16S ribosomal RNA gene of each colony type was sequenced and found to be consistent with the other colony type and *P. macerans*, strain NRS 888 (GenBank: JMQA00000000.1).

³Relatedness between bacterial strains has traditionally been determined using DDH. For additional information, refer to Auch, A. F., et al. "Digital DNA-DNA Hybridization for Microbial Species Delineation by Means of Genome-to-Genome Sequence Comparison." *Stand. Genomic Sci.* 2 (2010): 117-134. PubMed: 21304684. dDDH analysis was performed using the Type (Strain) Genome Server.

⁴The whole genome of *P. macerans*, strain NRS 888 was sequenced using the Illumina® MiSeq® system. *De novo* contig sequences were generated using Unicycler v0.4.8-beta.

⁵*P. thermophilus* is a heterotypic synonym for *P. macerans*. For more information, please see Kobayashi, H., et al. "Reclassification of *Paenibacillus thermophilus* Zhou et al. 2013 as a later heterotypic synonym of *Paenibacillus macerans* (Schardinger 1905) Ash et al. 1994." *Int. J. Syst. Evol. Microbiol.* 69 (2019): 417-421. PubMed: 30540240.

Figure 1: Colony Morphology



/Heather Couch/
Heather Couch

14 JUL 2021

Program Manager or designee, ATCC Federal Solutions

ATCC[®], on behalf of BEI Resources, hereby represents and warrants that the material provided under this certificate has been subjected by ATCC[®] to the tests and procedures specified and that the results described, along with any other data provided in this certificate, are true and accurate to the best of ATCC[®]'s knowledge.

ATCC[®] is a trademark of the American Type Culture Collection.

You are authorized to use this product for research use only. It is not intended for human use.

