

***Mycobacterium tuberculosis*, Strain KT-0009**

Catalog No. NR-43794

Product Description:

Mycobacterium tuberculosis (*M. tuberculosis*), strain KT-0009 was isolated from a human in South Korea. Strain KT-0009 was deposited as an extensively drug-resistant (XDR) Beijing genotype strain with resistance to isoniazid, kanamycin, moxifloxacin, ofloxacin and rifampin. NR-43794 was produced by inoculation of the deposited material into Middlebrook 7H9 broth with ADC enrichment. Broth inoculum was added to Middlebrook 7H10 agar with OADC enrichment kolles, which were grown for 44 days at 37°C in an aerobic atmosphere with 5% CO₂ to produce this lot.

Lot: 70013979

Manufacturing Date: 01JUN2018

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis¹ Cellular morphology 21 days at 37°C in an aerobic atmosphere with 5% CO ₂ on Middlebrook 7H10 agar with OADC enrichment Colony morphology Growth rate Growth at 26°C Growth at 37°C Acid-fast stain Pigmentation in the dark (Scotochromogen) Photoinduction for 1 hour (Photochromogen) Nonchromogen (no pigment) Biochemical tests Niacin production ² Nitrate reduction	Gram-positive rods Report results ≥ 7 days Negative Positive Positive (red colonies) Negative (no pigment) Negative (no pigment) Positive (no pigment) Positive Positive	Gram-positive rods Irregular, slight peaked, undulate, rough and cream (Figure 1) 21 days Negative Positive Positive (red colonies) Negative (no pigment) Negative (no pigment) Positive (no pigment) Positive Positive
Antibiotic Susceptibility Profile Sensititre™ System ^{3,4} Amikacin Cycloserine Ethambutol Ethionamide Isoniazid Kanamycin Moxifloxacin Ofloxacin Para-aminosalicylic acid Rifabutin Rifampin Streptomycin	Report results Report results Report results Report results Report results Report results Report results Report results Report results Report results Report results Report results	0.5 µg/mL 32 µg/mL ^{5,6} 4 µg/mL ⁷ 5 µg/mL ^{6,7,8} > 4 µg/mL 20 µg/mL ⁹ 8 µg/mL ^{6,10} 16 µg/mL ^{6,11} 1 µg/mL ⁷ 1 µg/mL ^{6,7,12} > 16 µg/mL 0.5 µg/mL ⁷
Genotypic Analysis Sequencing of Heat Shock Protein 65 gene (~ 1620 base pairs)	≥ 99% sequence identity to <i>M. tuberculosis</i> type strain (GenBank: AL123456.3)	100% sequence identity to <i>M. tuberculosis</i> type strain (GenBank: AL123456.3) ¹³
Purity (post-freeze) Middlebrook 7H10 agar with OADC enrichment 31 days at 37°C in an aerobic atmosphere with 5% CO ₂ Tryptic Soy agar 21 days at 37°C in an aerobic atmosphere with 5% CO ₂	Growth consistent with expected colony morphology Report results	Growth consistent with expected colony morphology Growth consistent with expected colony morphology

TEST	SPECIFICATIONS	RESULTS
Viability (post-freeze) 21 days at 37°C in an aerobic atmosphere with 5% CO ₂ on Middlebrook 7H10 agar with OADC enrichment	Growth	Growth

¹Information on *Mycobacterium* testing is available from Ribón, W. "Biochemical Isolation and Identification of Mycobacteria." Biochemical Testing. (2012) Jose C. Jimenez-Lopez (Ed.), InTech, <http://www.intechopen.com/books/biochemical-testing/biochemical-isolation-and-identification-of-mycobacteria> and Lévy-Frèbault, V. V. and F. Portaels. "Proposed Minimal Standards for the Genus *Mycobacterium* and for Description of New Slowly Growing *Mycobacterium* Species." Int. J. Syst. Bacteriol. 42 (1992): 315-323. PubMed: 1581193.

²All mycobacteria produce niacin but only *M. tuberculosis* accumulates it, resulting in a positive test for *M. tuberculosis*.

³Sensititre™ System *Mycobacterium tuberculosis* MIC Plate, Thermo Scientific™, catalog number MYCOTB

⁴Minimum Inhibitory Concentration (MIC); No Clinical & Laboratory Standards Institute (CLSI) interpretations of the Sensititre™ System data for *M. tuberculosis* are currently available.

⁵Two MICs were observed for cycloserine (16 µg/mL and 32 µg/mL) under identical test conditions. The highest MIC is being reported as the test result.

⁶Variability in the MIC result by the Sensititre™ method has been demonstrated [Lee, J., et al. "Sensititre MYCOTB MIC Plate for Testing *Mycobacterium tuberculosis* Susceptibility to First- and Second-Line Drugs." Antimicrob. Agents Chemother. 58 (2014): 11-18. PubMed: 24100497.], with the results for a single antibiotic typically within one doubling dilution.

⁷For ethambutol, ethionamide, para-aminosalicylic acid, rifabutin and streptomycin, the endpoint for these drugs is determined by the well with approximately 80% inhibition of growth compared to the positive control well with no drug.

⁸Two MICs were observed for ethionamide (2.5 µg/mL and 5 µg/mL) under identical test conditions. The highest MIC is being reported as the test result.

⁹Two MICs were observed for kanamycin (10 µg/mL and 20 µg/mL) under identical test conditions. The highest MIC is being reported as the test result.

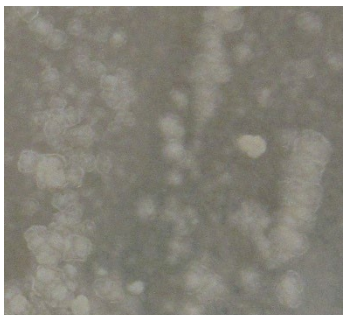
¹⁰Two MICs were observed for moxifloxacin (4 µg/mL and 8 µg/mL) under identical test conditions. The highest MIC is being reported as the test result.

¹¹Two MICs were observed for ofloxacin (8 µg/mL and 16 µg/mL) under identical test conditions. The highest MIC is being reported as the test result.

¹²Two MICs were observed for rifabutin (0.5 µg/mL and 1 µg/mL) under identical test conditions. The highest MIC is being reported as the test result.

¹³Also consistent with *M. africanum*, *M. bovis*, *M. canettii*, *M. caprae* and *M. microti*

Figure 1: Colony Morphology



/Heather Couch/

Heather Couch

Program Manager or designee, ATCC Federal Solutions

23 JUL 2020

ATCC®, on behalf of BEI Resources, hereby represents and warrants that the material provided under this certificate has been subjected 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.

