

Mycobacterium tuberculosis, Strain KT-0024
Catalog No. NR-43809
Product Description:

Mycobacterium tuberculosis (*M. tuberculosis*), strain KT-0024 is a human isolate from South Korea. Strain KT-0024 was deposited as an extensively drug-resistant (XDR) Beijing genotype strain with resistance to ethambutol, isoniazid, moxifloxacin, ofloxacin, pyrazinamide, rifampin and streptomycin.

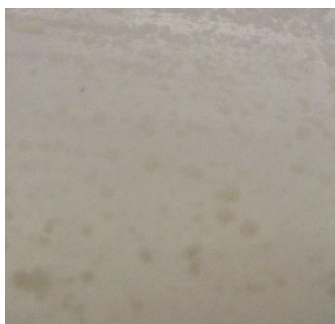
Lot: 70021308¹
Manufacturing Date: 01MAR2019

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis² Cellular morphology Colony morphology ³ 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 ⁴ Nitrate reduction Pyrazinamidase	Gram-positive rods Report results ≥ 7 days Negative Positive Positive (red colonies) Negative (no pigment) Negative (no pigment) Positive (no pigment) Positive Positive Positive	Gram-positive rods Irregular, low convex, undulate, rough and cream (Figure 1) 21 days Negative Positive Positive (red colonies) Negative (no pigment) Negative (no pigment) Positive (no pigment) Positive Positive Negative⁵
Antibiotic Susceptibility Profile Sensititre™ System ^{6,7} 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 Report results	0.25 µg/mL 32 µg/mL 8 µg/mL ⁸⁻¹⁰ 5 µg/mL ⁸ 1 µg/mL 2.5 µg/mL ^{10,11} 4 µg/mL 16 µg/mL 2 µg/mL ^{8,10,12} 4 µg/mL ^{8,10,13} > 16 µg/mL > 32 µg/mL ⁸
Genotypic Analysis Sequencing of Heat Shock Protein 65 gene (~ 1540 base pairs)	≥ 99% sequence identity to <i>M. tuberculosis</i> , strain KT-0024 (GenBank: JLSA01000069.1)	100% sequence identity to <i>M. tuberculosis</i> , strain KT-0024 (GenBank: JLSA01000069.1) ¹⁴
Purity (post-freeze) Middlebrook 7H10 agar with OADC enrichment ¹⁵ Tryptic Soy agar ¹⁶	Growth consistent with expected colony morphology Report results	Growth consistent with expected colony morphology Growth consistent with expected colony morphology
Viability (post-freeze)³	Growth	Growth

¹NR-43809 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 22 days at 37°C in an aerobic atmosphere with 5% CO₂ to produce this lot.

- ²Information 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-Frébault, V. V. and F. Portals. "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.
- ³21 days at 37°C in an aerobic atmosphere with 5% CO₂ on Middlebrook 7H10 agar with OADC enrichment
- ⁴All mycobacteria produce niacin but only *M. tuberculosis* accumulates it, resulting in a positive test for *M. tuberculosis*.
- ⁵A negative result may indicate a low expression of pyrazinamidase activity or a mutation to the pyrazinamidase/nicotinamidase (*pncA*) gene conferring resistance to pyrazinamidase (Sheen, P., et al. "Effect of Pyrazinamidase Activity on Pyrazinamide Resistance in *Mycobacterium tuberculosis*." *Tuberculosis (Edinb.)* 89 (2009): 109-113. PubMed: 19249243.).
- ⁶Sensititre™ System *Mycobacterium tuberculosis* MIC Plate, Thermo Scientific™, catalog number MYCOTB
- ⁷Minimum Inhibitory Concentration (MIC); No Clinical & Laboratory Standards Institute (CLSI) interpretations of the Sensititre™ System data for *M. tuberculosis* are currently available.
- ⁸For 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.
- ⁹Two MICs were observed for ethambutol (4 µg/mL and 8 µg/mL) under identical test conditions. The highest MIC is being reported as the test result.
- ¹⁰Variability 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.
- ¹¹Two MICs were observed for kanamycin (1.2 µg/mL and 2.5 µg/mL) under identical test conditions. The highest MIC is being reported as the test result.
- ¹²Two MICs were observed for para-aminosalicylic acid (1 µg/mL and 2 µg/mL) under identical test conditions. The highest MIC is being reported as the test result.
- ¹³Two MICs were observed for rifabutin (2 µg/mL and 4 µg/mL) under identical test conditions. The highest MIC is being reported as the test result.
- ¹⁴Also consistent with *M. africanum*, *M. bovis*, *M. canettii*, *M. caprae* and *M. microti*
- ¹⁵Purity of this lot was assessed for 32 days at 37°C in an aerobic atmosphere with 5% CO₂.
- ¹⁶Purity of this lot was assessed for 21 days at 37°C in an aerobic atmosphere with 5% CO₂.

Figure 1: Colony Morphology



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