

***Mycobacterium tuberculosis*, Strain KT-0005**

Catalog No. NR-43790

Product Description:

Mycobacterium tuberculosis (*M. tuberculosis*), strain KT-0005 was isolated in 2006 from a human in South Korea. Strain KT-0005 was deposited as an extensively drug-resistant (XDR) Beijing genotype strain with resistance to capreomycin, isoniazid, kanamycin, ofloxacin, pyrazinamide and rifampin. NR-43790 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: 70013971

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 | > 16 µg/mL 64 µg/mL ^{5,6} 4 µg/mL ⁷ > 40 µg/mL ^{6,7,8} 2 µg/mL ^{6,9} > 40 µg/mL 4 µg/mL ^{6,10} 16 µg/mL ^{6,11} > 64 µg/mL ⁷ > 16 µg/mL ⁷ > 16 µg/mL 8 µg/mL ^{6,7,12} |
| Genotypic Analysis Sequencing of Heat Shock Protein 65 gene (1620 base pairs) | ≥ 99% sequence identity to <i>M. tuberculosis</i> , strain KT-0005 (GenBank: JUFV01000094.1) | 100% sequence identity to <i>M. tuberculosis</i> , strain KT-0005 (GenBank: JUFV01000094.1) ¹³ |
| Purity (post-freeze) Middlebrook 7H10 agar with OADC enrichment 32 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 (32 µg/mL and 64 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 (40 µg/mL and > 40 µg/mL) under identical test conditions. The highest MIC is being reported as the test result.

⁹Two MICs were observed for isoniazid (1 µg/mL and 2 µg/mL) under identical test conditions. The highest MIC is being reported as the test result.

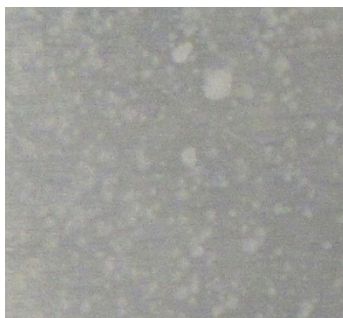
¹⁰Two MICs were observed for moxifloxacin (2 µg/mL and 4 µg/mL) under identical test conditions. The highest MIC is being reported as the test result.

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 streptomycin (4 µg/mL and 8 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



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