

**Mycobacterium tuberculosis, Strain KT-0016**
**Catalog No. NR-43801**
**Product Description:**

*Mycobacterium tuberculosis* (*M. tuberculosis*), strain KT-0016 was isolated from a human in South Korea. Strain KT-0016 was deposited as an extensively drug-resistant (XDR) Beijing genotype strain with resistance to capreomycin, isoniazid, kanamycin, moxifloxacin, ofloxacin, pyrazinamide, rifampin and streptomycin. NR-43801 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 38 days at 37°C in an aerobic atmosphere with 5% CO<sub>2</sub> to produce this lot.

**Lot: 70014681**
**Manufacturing Date: 01JUN2018**

TEST	SPECIFICATIONS	RESULTS
<b>Phenotypic Analysis<sup>1</sup></b> Cellular morphology 21 days at 37°C in an aerobic atmosphere with 5% CO <sub>2</sub> 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) Nonchromogen (no pigment) Biochemical tests Niacin production <sup>2</sup> Nitrate reduction	Gram-positive rods  Report results  ≥ 7 days Negative Positive Positive (red colonies) Negative (no pigment) Negative (no pigment) Positive (no pigment) Positive (no pigment)	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 (no pigment)
<b>Antibiotic Susceptibility Profile</b> Sensititre™ System <sup>3,4</sup> 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 <sup>5,6</sup> 8 µg/mL <sup>7</sup> 20 µg/mL <sup>6,7,8</sup> > 4 µg/mL <sup>6,9</sup> > 40 µg/mL 8 µg/mL 16 µg/mL > 64 µg/mL <sup>7</sup> 1 µg/mL <sup>7</sup> > 16 µg/mL 1 µg/mL <sup>6,7,10</sup>
<b>Genotypic Analysis</b> Sequencing of Heat Shock Protein 65 gene (~ 1620 base pairs)	≥ 99% sequence identity to <i>M. tuberculosis</i> , strain KT-0016 (GenBank: JLSF01000011.1)	100% sequence identity to <i>M. tuberculosis</i> , strain KT-0016 (GenBank: JLSF01000011.1) <sup>11</sup>
<b>Purity (post-freeze)</b> Middlebrook 7H10 agar with OADC enrichment 45 days at 37°C in an aerobic atmosphere with 5% CO <sub>2</sub> Tryptic Soy agar 21 days at 37°C in an aerobic atmosphere with 5% CO <sub>2</sub>	Growth consistent with expected colony morphology Report results	Growth consistent with expected colony morphology Growth consistent with expected colony morphology

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

<sup>1</sup>Information 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. 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.

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

<sup>3</sup>Sensititre™ System *Mycobacterium tuberculosis* MIC Plate, Thermo Scientific™, catalog number MYCOTB

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

<sup>5</sup>Two 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.

<sup>6</sup>Variability 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.

<sup>7</sup>For 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.

<sup>8</sup>Two MICs were observed for ethionamide (10 µg/mL and 20 µg/mL) under identical test conditions. The highest MIC is being reported as the test result.

<sup>9</sup>Two MICs were observed for isoniazid (4 µg/mL and > 4 µg/mL) under identical test conditions. The highest MIC is being reported as the test result.

<sup>10</sup>Two MICs were observed for streptomycin (0.5 µg/mL and 1 µg/mL) under identical test conditions. The highest MIC is being reported as the test result.

<sup>11</sup>Also consistent with *M. africanum*, *M. bovis*, *M. canettii*, *M. caprae* and *M. microti*

**Figure 1: Colony Morphology**



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