

***Mycobacterium tuberculosis*, Strain HN4702**

Catalog No. NR-19048

Product Description: *Mycobacterium tuberculosis* (*M. tuberculosis*), strain HN4702 was isolated in 2008 from human pulmonary tissue in Texas, USA. *M. tuberculosis*, strain HN4702 was deposited as an extensively drug-resistant (XDR) strain of tuberculosis with resistance to rifabutin, isoniazid, rifampicin, ethambutol, pyrazinamide, ofloxacin, streptomycin and kanamycin.

Lot¹: 63383548

Manufacturing Date: 21MAY2015

| 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, slight peaked, undulate, rough and cream (Figure 1) 20 days Negative Positive Positive (red colonies) Negative (no pigment) Negative (no pigment) Negative (no pigment) Positive (no pigment) Positive Positive Positive |
| Genotypic Analysis Sequencing of Heat Shock Protein 65 gene (430 base pairs) | ≥ 99% sequence identity to <i>M. tuberculosis</i> type strain (GenBank: AL123456) | 100% sequence identity to <i>M. tuberculosis</i> type strain (GenBank: AL123456) ⁵ |
| Purity (post-freeze)⁶ | Consistent with expected colony morphology | Consistent with expected colony morphology |
| Viability (post-freeze)³ | Growth | Growth |

¹NR-19048 was produced by inoculation of the deposited material into Middlebrook 7H9 broth with ADC enrichment and grown for 36 days at 37°C in an aerobic atmosphere with 5% CO₂. Broth inoculum was added to Middlebrook 7H10 agar with OADC enrichment kolles which were grown for 27 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-Frédault, 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.

³20 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*.

⁵Also consistent with *M. africanum*, *M. bovis*, *M. canettii* and *M. microti*

⁶Purity of this lot was assessed for 21 days at 37°C in an aerobic atmosphere with 5% CO₂ on Middlebrook 7H10 agar with OADC enrichment and Tryptic Soy agar plates.

Figure 1: Colony Morphology



Date: 22 JUN 2016

Signature:

A handwritten signature in black ink, appearing to read "David C. Cook". The signature is written in a cursive, flowing style.

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