

***Mycobacterium mantenii*, Strain NLA000401474T**

Catalog No. NR-49079

Product Description: *Mycobacterium mantenii* (*M. mantenii*), strain NLA000401474T was isolated in 2004 from a lymph node biopsy specimen from a 2-year-old female patient in the Netherlands.

Lot¹: 64362428

Manufacturing Date: 01AUG2016

TEST	SPECIFICATIONS	RESULTS
Phenotypic Analysis^{2,3} Cellular morphology Colony morphology ⁴ Growth rate Growth at 45°C Growth at 55°C Acid-fast stain Pigmentation in the dark (Scotochromogen) Photoinduction for 1 hour (Photochromogen) Nonchromogen (no pigment) Biochemical tests Catalase Catalase (semiquantitative) Catalase (68°C) Iron uptake Nitrate reduction Tween 80 hydrolysis Urease Growth in the presence of 5% sodium chloride Growth in the presence of thiophene-2-carboxylic acid hydrazide (TCH)	Rods Report results ≥ 7 days Negative Report results Positive (red colonies) Positive Negative Negative Report results Positive Positive Report results Negative Negative Negative Positive Report results Positive	Rods Circular, raised, entire, smooth and yellow (Figure 1) 11 days Negative Negative Positive (red colonies) Positive Negative Negative Positive Positive Positive Negative Negative Negative Positive Negative Positive
Genotypic Analysis Sequencing of 16S ribosomal RNA gene (~1470 base pairs) Digital DNA-DNA hybridization (dDDH) ⁵	≥ 99% sequence identity to <i>M. mantenii</i> type strain (GenBank: FJ042897.1) ≥ 70% for species identification	99.9% sequence identity to <i>M. mantenii</i> type strain (GenBank: FJ042897.1) Not determined ^{6,7} (Table 1)
Purity (post-freeze) Middlebrook 7H10 agar with OADC enrichment ⁸ Tryptic Soy agar ⁸	Growth consistent with expected colony morphology Report results	Growth consistent with expected colony morphology Growth consistent with expected colony morphology
Viability (post-freeze)⁴	Growth	Growth

¹NR-49079 was produced by inoculation of the deposited material into Middlebrook 7H9 broth with ADC enrichment and grown for 14 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 6 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. 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.

³Phenotypic characterization of *M. mantenii* was performed following van Ingen, J., et al. "*Mycobacterium mantenii* sp. nov., a Pathogenic, Slowly Growing, Scotochromogenic Species." *Int. J. Syst. Evol. Microbiol.* 59 (2009): 2782-2787. PubMed: 19625425.

⁴11 days at 37°C in an aerobic atmosphere with 5% CO₂ on Middlebrook 7H10 agar with OADC enrichment

⁵Relatedness between bacterial strains has traditionally been determined using DDH. For additional information, refer to Auch, A.F., et al. "Digital DNA-DNA Hybridization for Microbial Species Delineation by Means of Genome-to-Genome Sequence Comparison." *Stand. Genomic Sci.* 2 (2010): 117-134. PubMed: 21304684.

⁶The whole genome of *M. mantenii*, strain NLA000401474T (Contig Total Length ~ 6.1 megabase pairs) was sequenced using the Illumina[®] MiSeq[®] system and was assembled and analyzed with CLC Genomics Workbench Version 7.0.2.

⁷The required whole genome sequence for the type strain of this species is not available. dDDH testing rules out all species listed in Table 1, however, this does not rule out species for which the type strains whole genome sequences are not available.

⁸Purity of this lot was assessed for 11 days at 37°C in an aerobic atmosphere with 5% CO₂.

Figure 1: Colony Morphology

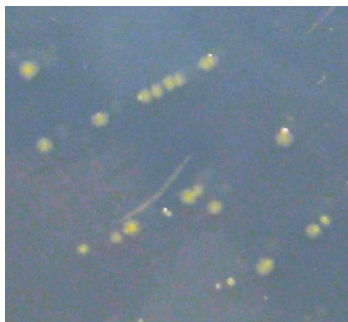


Table 1: Digital DNA-DNA hybridization (dDDH)

Species	Strain	Accession #	GGD vs. NR-49079 (Deposited as: <i>M. mantenii</i>)
<i>M. abscessus</i> subsp. <i>abscessus</i>	Hauduroy L948 ^T	NC_010397.1	19.6
<i>M. abscessus</i> subsp. <i>bolletii</i>	BD ^T	AHAS00000000.1	19.5
<i>M. abscessus</i> subsp. <i>massiliense</i>	CCUG 48898 ^T	NZ_AP014547.1	19.4
<i>M. aromaticivorans</i>	JS19b1 ^T	JALN00000000.2	20.1
<i>M. aurum</i>	ATCC 23366 ^T	CVQQ01000001.1	20.1
<i>M. austroafricanum</i>	E9789-SA12441 ^T	HG964450.1	19.9
<i>M. avium</i> subsp. <i>avium</i>	ATCC 25291 ^T	ACFI00000000.1	29.8
<i>M. avium</i> subsp. <i>paratuberculosis</i>	ATCC 19698 ^T	AGAR00000000.1	30.3
<i>M. avium</i> subsp. <i>silvaticum</i>	6409 ^T	AYOC00000000.1	30.2
<i>M. bohemicum</i>	CIP 105808 ^T	CSTD01000001.1	24.9
<i>M. canariense</i>	502329 ^T	BCSY00000000.1	20.2
<i>M. celatum</i>	ATCC 51131 ^T	BBUN00000000.1	22.4
<i>M. chelonae</i>	CM 6388 ^T	CP010946.1	19
<i>M. chlorophenicolum</i>	PCP-I ^T	JYNL00000000.1	20
<i>M. chubuense</i>	48013 ^T	NC_018027.1	19.9
<i>M. colombiense</i>	10B ^T	AFVW00000000.2	36.6
<i>M. conceptionense</i>	D16 ^T	CTEF00000000.1	20.2
<i>M. cosmeticum</i>	LTA-388 ^T	CCBB00000000.1	20.4
<i>M. crocinum</i>	czh-42 ^T	BBHD00000000.1	21.7
<i>M. farcinogenes</i>	IEMVT 75 ^T	CCAY00000000.1	20
<i>M. fluoranthenorivorans</i>	FA4 ^T	BBFT00000000.1	21.6
<i>M. fortuitum</i> subsp. <i>fortuitum</i>	ATCC 6841 ^T	CP014258.1	19.7
<i>M. fortuitum</i> subsp. <i>acetamidolyticum</i>	NCH E11620 ^T	BCSZ00000000.1	19.8
<i>M. gastri</i>	ATCC 15754 ^T	AZYN00000000.1	22.5
<i>M. genavense</i>	2289 ^T	JAGZ00000000.1	23.5
<i>M. haemophilum</i>	ATCC 29548 ^T	CP011883.2	22.4
<i>M. hassiacum</i>	3849 ^T	ARBU00000000.1	20.3
<i>M. hodleri</i>	EMI2 ^T	BBGO00000000.1	23.1
<i>M. intracellulare</i>	ATCC 13950 ^T	NC_016946.1	31.2
<i>M. kansasii</i>	ATCC 12478 ^T	NC_022663.1	22.3
<i>M. kyorinense</i>	KUM 060204 ^T	BBKA00000000.1	21.9

Species	Strain	Accession #	GGD vs. NR-49079 (Deposited as: <i>M. mantenii</i>)
<i>M. mageritense</i>	938 ^T	CCBF000000000.1	20.1
<i>M. neoaurum</i>	ATCC 25795 ^T	JMDW000000000.1	19.9
<i>M. neworleansense</i>	W6705 ^T	CWKH000000000.1	20
<i>M. novocastrense</i>	73 ^T	BCTA000000000.1	20.2
<i>M. obuense</i>	47001 ^T	JYNU000000000.1	20.2
<i>M. pallens</i>	czh-8 ^T	BBHE000000000.1	21.9
<i>M. parascrofulaceum</i>	HSC-68 ^T	ADNV000000000.1	26.3
<i>M. pseudoshottsii</i>	L15 ^T	BCND000000000.1	21.3
<i>M. pyrenivorans</i>	17A3 ^T	BBHB000000000.1	22.1
<i>M. rufum</i>	JS14 ^T	JROA000000000.1	20
<i>M. rutilum</i>	czh-117 ^T	BBHF000000000.1	23.6
<i>M. septicum</i>	W4964 ^T	CBMO000000000.1	19.9
<i>M. setense</i>	ABO-M06 ^T	JTJW000000000.1	19.9
<i>M. simiae</i>	ATCC 25275 ^T	CBMJ000000000.2	22.9
<i>M. smegmatis</i>	ATCC 19420 ^T	LN831039.1	19.9
<i>M. thermoresistibile</i>	ATCC 19527 ^T	BCTB000000000.1	20
<i>M. triplex</i>	90-1019 ^T	CCAU000000000.1	24.2
<i>M. tuberculosis</i>	H37Rv ^T	NC_000962.3	22
<i>M. vaccae</i>	ATCC 15483 ^T	BCRS000000000.1	20.3
<i>M. vanbaalenii</i>	PYR-1 ^T	NC_008726.1	20.1
<i>M. vulneris</i>	NLA000700772 ^T	CCBG000000000.1	20.1
<i>M. yongonense</i>	05-1390 ^T	NC_021715.1	30.9
<i>Nocardia asteroides</i>	NBRC 15531 ^T	BAFO000000000.2	19.3

Date: 15 JUN 2017

Signature:

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