



Potential Microorganisms from Bronchial Lavage Fluid in Bronchiectasis Patients: Bacteria, Nontuberculous Mycobacteria, and Fungi

Lam Nguyen Ho^{1,2,3,5,*} , Quoc-Khanh Tran-Le¹, Hoang Kim Tu Trinh⁴, Vu Le-Thuong^{1,2}, Van Pham-Hung^{6,7}, Huong Pham-Thien⁶, Phu Truong-Thien⁸, Thong Dang-Vu³, Dung Lam-Quoc³ and Ngoc Tran-Van^{1,5}

¹Department of Internal Medicine, University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam

²Department of Respiratory , University Medical Center Ho Chi Minh City, Ho Chi Minh City, Vietnam

³Department of Respiratory , Cho Ray's Hospital, Vietnam

⁴Center for Molecular Biomedicine, University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam

⁵Ngoc Minh Clinic, Ho Chi Minh City, Vietnam

⁶Microbiology, International Research Institute of Gene and Immunology, Ho Chi Minh City, Vietnam

⁷Microbiology, Phan Chau Trinh University, Vietnam

⁸Department of Microbiology , Cho Ray's hospital, Ho Chi Minh City, Vietnam

© 2025 The Author(s). Published by Bentham Open.

This is an open access article distributed under the terms of the Creative Commons Attribution 4.0 International Public License (CC-BY 4.0), a copy of which is available at: <https://creativecommons.org/licenses/by/4.0/legalcode>. This license permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

*Address correspondence to this author at the Department of Respiratory, University Medical Center Ho Chi Minh City, 215, Hong Bang, Ward 11, District 5, Ho Chi Minh City, Vietnam; E-mails: lam.nh@umc.edu.vn, nguyễnholam@ump.edu.vn, bsholam1986@gmail.com

Cite as: Ho L, Tran-Le Q, Trinh H, Le-Thuong V, Pham-Hung V, Pham-Thien H, Truong-Thien P, Dang-Vu T, Lam-Quoc D, Tran-Van N. Potential Microorganisms from Bronchial Lavage Fluid in Bronchiectasis Patients: Bacteria, Nontuberculous Mycobacteria, and Fungi. Open Respir Med J, 2025; 19: e18743064392945250613055623. <http://dx.doi.org/10.2174/0118743064392945250613055623>



CrossMark

Received: February 21, 2025

Revised: April 30, 2025

Accepted: May 07, 2025

Published: June 18, 2025



Send Orders for Reprints to
reprints@benthamscience.net

Supplement S1. Principles of designing primers and Taqman probes in multiplex real-time PCR:

- [1] Primers must have a melting temperature of 60°C and a matching efficiency on the target DNA of at least 75%.
- [2] Primers should be at least 18 bases long and no longer than 30 bases.
- [3] Primers should not have more than 3 identical bases at both ends.
- [4] Primers should not self-pair. Forward and reverse primers should not have sequences that allow them to bind to each other. Primers also must not have self-complementary regions to form hairpin structures.
- [5] Taqman probes must have a melting temperature of 70°C and a matching efficiency on the target DNA of at least

75%.

- [6] Taqman probes should be at least 20 bases long and no longer than 29 bases.
- [7] Taqman probes should not have a 5' end with G, as G adsorbs the fluorescence of the reporter attached to the 5' end of the Taqman probe.
- [8] Taqman probes should not have more than 3 identical bases at both ends.
- [9] Taqman probes should not self-pair, pair with primers, or form hairpin structures.
- [10] In multiplex real-time PCR, primers and Taqman probes should be designed to avoid pairing with each other.
- [11] In multiplex real-time PCR, the emission wavelengths of reporters should be separated to prevent cross-signal detection.

Supplement Table S1. 5'-3' Primer and Probe Sequences for MPL Real-Time PCR Detection of Mycobacteria Species

MPL-rPCR	Target Species	Fluorophore	Forward Primer Sequence (5'-3')	Reverse Primer Sequence (5'-3')
MPL-rPCR 1	M. tuberculosis/M. bovis	FAM	TGCAAGTCGAACGGAAAGGT	TCACGAACAACGCGACAAAC
	M. avium	HEX	TCGAACGAAAGGCCCTTC	TCACGAACAACGCGACAAAC
	M. ulcerans/M. marinum	TexasRED	ACTGAGATAACGGCCAGACT	TCACGAACAACGCGACAAAC
	M. intracellulare	CY5	AATTCCCTGGTAGCGGTGG	TAGCATGTGTAAGGCCCTGG
MPL-rPCR 2	M. kansasii/gastri	FAM	ACTGAGATAACGGCCAGACT	TCACGAACAACGCGACAAAC
	M. scrofulaceum/kansasii/simiae/gastri	HEX	TGGTAGTCCACGCGTAAAC	CACCTTCCTCCGAGTTGACC
	M. xenopi	TexasRED	ACCGGAAGAACCTTACCTGG	TAGCATGTGTAAGGCCCTGG
	M. fortuitum	CY5	CTGCCCTGCACTTGGGATA	AGTCTGGGCCGTATCTCAGT
MPL-rPCR 3	M. senegalense	FAM	GCAGGGGAGACTGGAATTCC	TGTGCATGTCAAACCCCAGGT
	M. abscessus/chelonae	HEX	ACCTGGGTTTGACATGCACA	CGGCCATTGTAGCATGTGTG
	M. genavense	TexasRED	TCCTTCCTGGATCCGTGC	TAGCATGTGTAAGGCCCTGG
	M. gordoneae	CY5	CACTGGGACTGAGATAACGGC	CGACAAACCACCTACGAGCT
MPL-rPCR 4	M. malmoeense	FAM	TGCACCTCGGATAAGCCTG	AGAAAACCCGGACCTTCGTC
	M. tilburgii	HEX	CACTGGGACTGAGATAACGGC	CCACCGCTACACCAGGAATT
	M. smegmatis	TexasRED	ACCTGGGTTTGACATGCACA	CACCTTCCTCCGAGTTGACC
	M. szulgai	CY5	GCAGGGGAGACTGGAATTCC	CCAGGTAAGGTTCTCCGCGT
MPL-rPCR 5	M. leprae	FAM	AGCTCGTAGGTGGTTGTCG	GTTTACGGCGTGGACTACCA
	M. flavescentis/smegmatis	HEX	ACCTCTTCGGTAGGGACGA	GGAATTCCAGTCTCCCCCTGC
	M. terrae	TexasRED	GTCGAACGAAAGGCTTCG	AGTCTGGGCCGTATCTCAGT
	M. cosmeticum	CY5	ATCAGTTCCCTGTGGCCTG	CGGCCATTGTAGCATGTGTG

Supplement Table S2. . Antimicrobial resistance profiles of bacteria isolated from bronchial lavage fluid

	Carbapenems	Cefepime	Cephalosporins 3	Fluoroquinolones	Aminoglycosides	TMP/SMX
Klebsiella pneumoniae (n = 11)	3/11	0/8	2/11	5/11	2/11	1/11
Pseudomonas aeruginosa (n = 10)	0/10	0/10	1/9	1/10	0/10	NA
Haemophilus influenzae (n = 5)	0/3	0/1	0/3	1/4	NA	3/3
Acinetobacter baumannii (n = 4)	4/4	4/4	4/4	4/4	3/4	2/4
Staphylococcus aureus (n = 2)	NA	NA	NA	NA	0/2	0/2
Escherichia coli (n = 2)	0/2	NA	2/2	1/2	2/2	2/2

*Non-susceptible to at least 1 antibiotic of the corresponding antibiotic class

Carbapenems: Meropenem, Imipenem, Ertapenem

Cephalosporins 3: Cefazidime, Ceftriaxone, Cefotaxime

Fluroquinolones: Levofloxacin, Ciprofloxacin

Aminoglycosides: Amikacin, Gentamycin, Tobramycin

TMP/SMX: Trimethoprim - Sulfamethoxazole **Intermediate susceptibility is classified as non-susceptible**

NA: not applicable

DISCLAIMER: The above article has been published, as is, ahead-of-print, to provide early visibility but is not the final version.

Major publication processes like copyediting, proofing, typesetting and further review are still to be done and may lead to changes in the final published version, if it is eventually published. All legal disclaimers that apply to the final published article also apply to this ahead-of-print version.