

Bacteriophage lysin as an alternative to MGIT PANTA to control normal flora in processed sputum specimens for rapid detection of Mycobacterium tuberculosis using BACTEC MGIT 960 system

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Reference ID:

ICMR/EoI/PM/12/Bacteriophage lysin MTB/2026

Lead Inventor: Dr. Balaji Subramanyam

Institute: ICMR – National Institute for Research in Tuberculosis

Technology Domain: Diagnostics

Disease Area (Broad):

Communicable Diseases (bacterial, viral, fungal, parasitic) – Mycobacterium Tuberculosis

Need and utility of the Technology from Public health perspective:

Phage lysin can selectively remove non-mycobacterial contaminants without affecting mycobacterial viability, offering a low-cost alternative to the current PANTA antibiotic mix used in sputum processing. Given its similar effectiveness and minimal production cost, it has strong potential for commercialization in rapid mycobacterial detection across liquid culture systems, including BACTEC MGIT 960.

Technology Readiness level (TRL):

- TRL-5: Validated at laboratory and by third-party

Validation Status and outcome:

Phage lysin was independently validated across four centres and proved to be comparable to MGIT-PANTA in controlling contamination and accurately detecting M. tuberculosis, confirming its suitability as a reliable, low-cost alternative for liquid culture diagnostics.

Market Potential:

The phage lysin-based contaminant control system has strong market potential as a cost-effective and efficient alternative to the widely used PANTA antibiotic mix in liquid culture-based TB diagnostics. With multicentric validation demonstrating performance comparable to PANTA in reducing contamination rates and maintaining high sensitivity, specificity, and diagnostic accuracy, the technology is well-positioned for adoption across the extensive network of TB laboratories currently using systems like BACTEC MGIT 960 under the National TB Elimination Program (NTEP).

Publication:

- Subramanyam B, Sivaramakrishnan GN, Dusthacker A, Nagamiah S, Kumar V. Phage lysin as a substitute for antibiotics to detect Mycobacterium tuberculosis from sputum samples with the BACTEC MGIT 960 system. Clin Microbiol Infect. 2012 May;18(5):497-501.
- Subramanyam, Balaji et al. "Phage lysin to control the overgrowth of normal flora in processed sputum samples for the rapid and sensitive detection of Mycobacterium tuberculosis by luciferase reporter phage assay." BMC infectious diseases vol. 13 44. 28 Jan. 2013.

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