

## A Rapid Immunodiagnostic Test for Active Tuberculosis.

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### Abstract

**Aim & Objective:** Tuberculosis (TB) is a globally prevalent disease that is caused by the aerobic, gram-positive agent *Mycobacterium tuberculosis*. Despite the accessibility of broad-spectrum antibiotics which are very effective against *M. tuberculosis*, the social and financial burden of the patients with the disease continues to be huge, especially in the developing regions such as India and sub-Saharan Africa. This is mainly owing to limited laboratory infrastructure, treatment with the least sensitive diagnostics, and non-adherence to the standard therapeutic regimens. In less equipped countries like India, where most TB cases occur, diagnosis and management of such infections become difficult owing to unavailability of rapid, accurate, and cost-effective detection systems. The available tests are either time consuming, cumbersome, or very costly. Here, we introduced new antigen detection from patient blood samples using monoclonal antibodies generated against three novel recombinant antigens.

**Methods:** The selected novel proteins named as Rv2145c (SS1), Rv1827 (SS4), and Rv2970c (SS5) were expressed in *E. coli* BL21DE3 cells and purified by affinity column chromatography. Furthermore, mice were injected with recombinant proteins and Freund's adjuvant. The monoclonal antibodies (mAbs) were developed using these antigens via hybridoma technology. Hybridoma clones were screened and positive clones were selected for further experiments. The mAbs were purified from cell culture supernatant using protein A mediated affinity column chromatography. The diagnostic potential of these mAbs was investigated using a well characterized cohort of patients with tuberculosis (pulmonary-TB, extra-pulmonary, and sera from healthy subjects) using sandwich ELISA.

**Results:** Our experimental results show admirable sensitivity of 94.59% (SS1), 86.49% (SS4), and 93.24% (SS5) while specificity was 98.29% (SS1), 96.57% (SS4), and 97.71% (SS5) in antigen detection test.

**Conclusions:** The developed antigen detection test could be useful for detection of active TB directly from patient serum sample. Furthermore, this test would be useful as screening in the poor and high burden countries.

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### Biography

Dr. Anil Gupta has completed his doctorate at the age of 32 years from ALL INDIA INSTITUTE OF MEDICAL SCIENCES (AIIMS), NEW DELHI, INDIA (Apex medical institute of India). He has published many research articles in various international journals i.e. Nature Publishing Group (NPG),

Parasite and Vector, Journal of Infection, ASM group etc. Additionally, He has published four book chapters and deposited more than 40 Genes to GenBank, NCBI, USA. His research interest is to develop an effective, cost effective, rapid test for the diagnosis of infectious diseases.