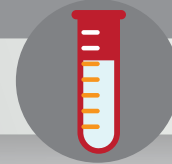


# Improving Active Tuberculosis Diagnosis Using Gene Expression Biomarkers



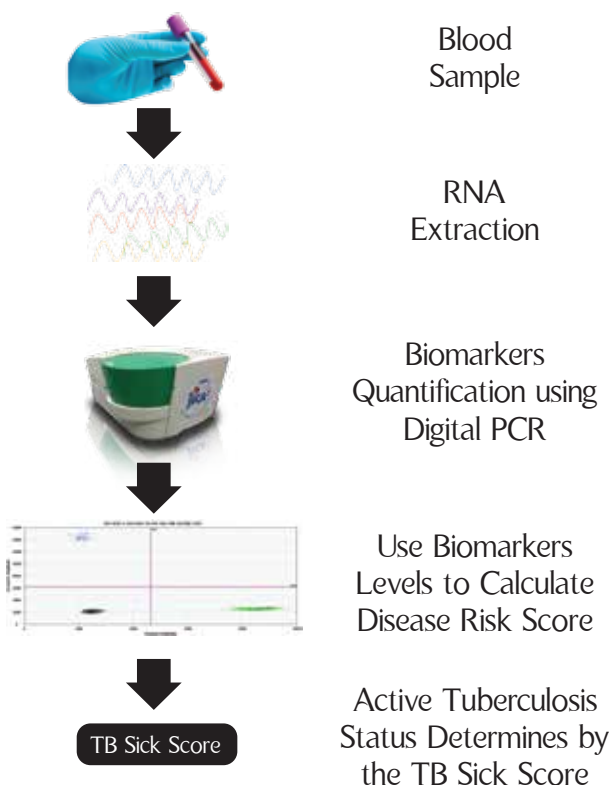
## Background

According to a report from the national Tuberculosis (TB) prevalence survey in Asia approximately 40-60% of the TB patients is asymptomatic and usually presents no bacteria in the sputum [1]. Therefore, the conventional methods to detect bacterial in sputum samples are not sensitive. Thus, a new method that looks for biomarkers for TB in samples other than sputum are required in order to improve the diagnosis of TB.

Recently, many reports describe the possible use of blood gene expression as novel biomarkers for identification of active TB in addition to conventional methods [2, 3].

Here, we developed a novel method for diagnosis of active TB by quantification of gene expression biomarkers in blood [4].

## Methodology



## Output

Methods for quantification of gene expression biomarkers for diagnosis of TB in suspect adult TB cases  
Identification of gene expression biomarkers that can distinguish active Tuberculosis cases in suspected pediatric TB patients

Identification of gene expression biomarkers that can be used for monitoring disease progression or treatment outcome in TB patients who receive anti-TB chemotherapy

## Outcome

Blood gene expression biomarkers quantification can be implemented for use as a diagnostic method for active Tuberculosis case finding in clinical setting, Especially for hard-to-diagnose cases such as sputum smear-negative cases, pediatric tuberculosis cases and HIV-TB co-infection cases where sputum smear and culture confirmation are not sufficiently informative.

## Impact

Ultimately, overall active TB case identification shall be improved by using this newly developed method in conjunction to the standard sputum smears and culture confirmation. This method could associate the decision-to-treat in cases whose sputum smears are negative and culture confirmation results are indeterminate. This will reduce unnecessary anti-TB chemotherapy usage given to the suspected TB cases with no confirmation and lead to better precise treatment for TB. There is also possibility to use this biomarkers to improve the TB preventive therapy, the key step of End TB strategy

## References

1. Onozaki, I., Law, I., et al. *Tropical Medicine and International Health*, 1-18. doi:10.1111/tmi.12534
2. Berry, M. P., Graham, C. M., et al. (2010). *Nature*, 466(7309), 973-977.
3. Zak, D.E., Penn-Nicholson, A., et al. (2016) *Lancet*, 387(10035), 2312-2322.
4. Satproedprai, N., Wichukchinda, N., et al. (2015). *Genes Immun*, 16(4), 253-260.