We have developed a new gene amplification method, loop-mediated isothermal amplification (LAMP), which has the potential advantages in rapidity, simplicity, and specificity. Because of the aforementioned characteristics, LAMP is recognized as one of ideal gene amplification methods that can be applied in resource-limited facilities in developing countries.

Tuberculosis (TB) is one of the greatest threats to global public health, infecting approximately one-third of the world’s population. Sputum smear tests are widely used for the detection of TB. However, they do not offer sufficient specificity and sensitivity for screening TB patients effectively. While the culture methods provide the most sensitive and reliable TB detection and have used as the standard of TB diagnostics, it has a disadvantage in rapidity since it often takes 4-6 weeks to obtain the results. Simple, rapid and sensitive TB diagnostic technology has been desired for effective TB control and elimination.

In order to meet the above demand, we have developed a new TB diagnostic method named TB-LAMP. One of the key technologies composing the TB-LAMP is the sample processing method named PURE (Procedure for Ultra Rapid Extraction) that can remove inhibitory components from unprocessed sputum samples in approximately 10 minutes. The other important technology is the formulation of LAMP reagents. Formulation in dried form enables us to transport and store the LAMP reagents at room temperature without relying on the expensive infrastructures such as cold chains and freezers.

The recommendation from World Health Organization (WHO) is essential for introducing a technology into the most developing countries. In order to obtain the recommendation to TB-LAMP, we conducted the evaluation study of TB-LAMP in various countries and successfully earned the recommendation in 2016. Because of its simplicity, rapidity and robustness, TB-LAMP is now widely recognized as a WHO recommended genetic test and begins to be implemented in some developing countries.

The LAMP technologies are also being applied to the diagnostics of malaria and some neglected tropical diseases. We hope to contribute to the improvement of global public health and to the realization of universal health coverage through the development of the effective diagnostics using LAMP.