

N.2: Transfer of technologies

N.2.1: “Raman Probe” for in-situ measurement of Raman scattering from low Raman active materials like biological tissues

A Raman probe is an important component of a Raman spectroscopic system intended for non-invasive analyses of any Raman active material. However, the extremely weak Raman intensity of biological tissues associated with the order of magnitude larger Rayleigh background swamping the measured Raman signal makes it difficult to develop an appropriate tissue Raman probe. Most of the commercially available Raman probes introduce various artefacts in the acquired signal that interfere with the Raman signatures appearing in the fingerprint region of the tissue Raman spectra. These artefacts create hindrance in signal detection and thus utility of the 'Raman Spectroscopy' systems is reduced. The Raman probe developed at RRCAT is meant for *in situ* measurement of artefact-free, good quality Raman spectra from low Raman-active materials like biological tissues. Technology of the 'Raman Probe' has been transferred to M/s Applied Optical Technologies Pvt. Ltd., Thane, through 'Technology Transfer and Coordination Division' of BARC, Mumbai. The developed Raman probe is expected to enhance utility of Raman spectroscopy systems in the field of biomedical applications where *in situ* measurement of Raman spectra is often desired but not possible because of unavailability of a suitable Raman probe.



The developed “Raman probe”.



Technology of “Raman Probe” being transferred to M/s Applied Optical Technologies Pvt. Ltd., Thane on the Technology Transfer Day Ceremony held on Oct 24, 2018 at BARC, Mumbai.

N.2.2: "TuBerculoScope"- A point-of-care of device of sputum microscopy to test for tuberculosis

Tuberculosis (TB) is a major health concern in India. Fluorescence microscopy is one of the WHO recommended methods for initial diagnosis of TB. However, the utility of this method largely remains inaccessible in rural and developing areas due to prohibitive cost of the equipment (fluorescence microscope) and its maintenance apart from the cost of trained technicians and laboratory infrastructure.



The developed “TuBerculoScope”.



Technology of “TuBerculoScope” being transferred to M/s RTK Meditech, Indore on the Technology Transfer Day Ceremony held on Oct 24, 2018 at BARC, Mumbai.

The 'TuberculoScope', developed at RRCAT, Indore is a low-cost, easy-to-use and portable point-of-care device for detection of Mycobacterium tuberculosis (the bacteria responsible for TB disease). It acquires fluorescence images of Mycobacterium tuberculi bacteria (Mtb) from a patient's sputum smeared on a microscope glass slide following its staining with an appropriate fluorescent dye (Auramine O). A Graphic User Interface (GUI) software enables hardware control of the device and automated counting of the Mtb bacteria in the field of view of the microscope objective. Technology of this device has been transferred to M/s RTK Meditech, Indore, through 'Technology Transfer and Coordination Division' of BARC, Mumbai. Due to the technology transfer, the 'TuBerculoScope' will now be available from Indian industry at a much lower cost as compared to the presently used imported equipment. This will facilitate early start of treatment for TB and reduction of patient dropouts particularly in remote areas.

Reported by:
S. K. Majumder (shkm@rrcat.gov.in)