Times of India (Indore), 12th December 2020, Page-2

IIT researchers find cost-effective, and fast way of detecting cancer

TIMES NEWS NETWORK

A team of researchers at IIT-Indore has published a study in understanding the mechanism of propagation of a widely known cancer causing virus, Epstein-Barr Virus (EBV) in brain cells using Raman Spectroscopy (RS)

Indore: A preliminary study by researchers at Indian Institute of Technology (IIT), Indore claims to have found non-invasive detection of virus infection in the brain and early diagnosis of cancer using Raman spectroscopy.

A team of researchers at IIT-I has published a study in understanding the mechanism of propagation of a widely known cancer causing virus, Epstein-Barr Virus (EBV) in brain cells using Raman Spectroscopy (RS). EBV can cause cancers like nasopharyngeal carcinoma (a type of head and neck cancer), B-cell (a type of white blood cells) cancer and stomach cancer.

Dr Hem Chandra Jha, corresponding author of the research and faculty at Biosciences and Biomedical Engineering at IIT, Indore said, "This method can be an alternative for biopsy in detecting cancer. This will be a fast, cost effective and robust diagnosis for virus related infection and cancer detection. Since, all the techniques available for viral load detection in the brain by far include invasive methods, RS can be a sigh of relief for patients undergoing brain biopsies for diagnostic purposes." The findings can be helpful in determining the stage of infection based on biomolecular markers and aid in early diagnosis.

The research team was led by Dr Hem Chandra Jha and Dr. Rajesh Kumar, faculty at IIT, Indore and assisted by research scholars Deeksha Tiwari, Shweta Jakhmola and Devesh Pathak.

The study says Raman scattering provides information on the structure of any material based on the vibrations produced in them. The light falling on the virus generates vibration in the biomolecules and RS can be used to capture and analyze its structure and behaviour. Every virus has a different biomolecular composition and thus generates a unique Raman Spectrum that serves as a fingerprint to its identity. The study said that 95 per cent of the adult population is positive for EBV, though the infection is mostly asymptomatic and very little is known about the factors which trigger development of such disease.

Another corresponding author of the study Dr Rajesh Kumar said, "The recent reports of consistent presence of EBV in brain tissue of the patients suffering from neurological disorders such as Alzheimer, Parkinson and multiple Sclerosis, has made it important to study the mechanism and its probable role in neurodegenerative disorders." The study also showed that EBV can infect the glial cells in the brain.

Jha said "We found that the virus may take different time intervals to establish and spread infection in various types of glial cells of the brain".

Some additional findings in collaboration with Dr Fouzia Siraj from National Institute of pathology, ICMR-Delhi, include detection and grading of brain tumors using Raman scattering. Chanchal Rani, Manushree Tanwar, Anjali Chaudhary, Ritika Kaushik, Kumari Neeshu, Omkar Indari, Dharmendra Kashyap and Buddhadev Baral are other scholars who contributed in the study.