

Raman spectroscopy tech can diagnose oral cancer at early stage: IIT-I study

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Raman Spectroscopy technique can be used to diagnose oral cancer at an early stage, according to a study by the Indian Institute of Technology Indore.

The institute has conducted a study on the effects of betel nut on the health of humans. Supari or betel nut has been a part of Indian culture since long and as per modern science, extensive use of supari is known to create health issues especially related to oral health in malnourished condition.



"Betel nut is a key cause of an oral precancerous condition called Oral Submucous Fibrosis (OSMF), characterised by a loss of elasticity in the cheek and a reduced mouth opening. If the condition is unad-

dressed, it can progress into oral cancer. The team studied the biomolecular mechanisms behind the pathogenesis of OSMF and identified the pathways that can be targeted to prevent its transformation to

cancer," Dr Hem Chandra Jha, the lead researcher said.

The study used a non-invasive spectroscopic technique, Raman microspectroscopy which was supported by Department of

Science and Technology (DST) under FIST scheme. The results were also verified using established sophisticated methods such as metabolomics and lipidomics by liquid chromatography-mass spectrometry (LC-MS).

Jha said, "Such studies can help doctors and scientists to develop methods for early diagnosis of cancer; moreover, they can help in cancer therapeutic to treat in early stages and improve the overall quality of life of the patients."

The research team consisted of Jha, along with his students Dr Tarun

Prakash Verma, Siddharth Singh, and Sonali Adhikari, in collaboration with prof Rajesh Kumar and Dr. Chanchal Rani from Department of Physics.

Rajesh Kumar said, "Methods like Raman Spectroscopy can serve as a non-invasive method in identification of the signature molecules for early diagnosis of cancer and various other diseases. Such techniques can be fast and reliable for mass screening in public health centres."

The study has been published in the Journal of Raman Spectroscopy.