MedicalXpress

Researchers developing novel method to test for HPV and oral cancers

June 24 2013

Research being carried out at the University of Notre Dame and its affiliated Harper Cancer Research Institute (HCRI) may lead to the development of a rapid, cost-effective means of screening for oral cancers and the human papillomavirus.

M. Sharon Stack, Ann F. and Elizabeth Riley director of the HCRI and professor of chemistry and biochemistry, points out that oral cancers are a significant global health problem. Although tobacco and alcohol awareness have helped decrease the overall incidence of oral cancers, HPV positive cancers, especially oropharynx cancers, have risen significantly.

Stack and Hsueh-Chia Chang, Bayer Professor of Engineering and director of Notre Dame's Center for Microfluidics and Medical Diagnostics, are attempting to prescreen for oral cancer and HPV by examining the micro-RNAs of tumor cells. They are working on developing a microfluidic sensor to help detect the presence of tumor cells.

The researchers point out that to be effective, the screening tests need to be done regularly, for example at a dentist's office during teeth cleaning. Rinsing with a mouthwash at a dentist's office can produce up to 10,000 cells that can be tested. In order to be feasible for a dentist's office, the screening process must be low cost, rapid and patient-friendly.

Chang's research group has developed a microfluidic membrane sensor

that can be used for this type of rapid screening. Although he points out that his sensor is not as accurate as optical sensors like real-time polymerase chain reaction (PCR), it is much cheaper ($1 versus $45 per test) and is rapid and can be used by personnel in a dentist's office. It also will allow the quantification of a panel of micro-RNAs.

The researchers believe that such a rapid and low-cost device would help to better reach high-risk patients prior to development of last-stage disease.

Provided by University of Notre Dame