# UC Davis probes into oral cancer

## Doctors discover new ways to distinguish between tissues

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*Aggie Science Writer*

UC Davis is searching for new and more effective methods to deal with oral cancer.

Researchers at the university have begun using a fluorescent oral probe to aid in the detection of malignant tissues. The probe allows for doctors to differentiate between healthy and malignant tissue, along with having the capacity of working as a screening device. Although still a prototype, the fluorescent probe is showing that it can be helpful to doctors both prior to and during surgery.

"The big picture is to improve the ability to diagnose tumors at an earlier stage," said Dr. Gregory Farwell, a head and neck surgeon at the UC Davis Medical Center.

Farwell said that people's ability to survive oral cancer is significantly increased if the cancer is detected at an early stage. He said that oral cancer is primarily caused by smoking, drinking and human papillomavirus (HPV). Farwell said oral cancer through HPV usually takes 10 to 20 years to develop.

43,000 Americans are diagnosed with oral cancer each year. While the cancer is not the most prevalent in the United States, Farwell said it is a major problem worldwide, especially in countries like India and China.

He said this probe could be of great utility for efficiently diagnosing different stages of cancer.

"It is a very effective way to discriminate between normal tissue and tumor tissue," Farwell said. "We're showing better results in distinguishing differences in tissue. It can even help discriminate between pre-cancer and advanced cancer."

The probe, which is relatively small, uses a laser light to interact with the tissue in order to receive the signals indicating whether or not it is malignant.

Farwell explained that this tissue distinction by the probe is crucial when it comes to tissue in the mouth.

"Our hope is that this technology can leave more of the patient's tissue in place because taking out an extra centimeter could be the difference in impacting swallowing, speech, or disfigurement," he said.

Farwell believes the probe has the potential to have widespread impact with oral cancer, as there are not many light-based probes out today. This can yield the probe to have an ever-increasing influence in the field.

Laura Marcu, a biomedical engineering professor at UC Davis, has been researching the probe's effects and positives with Farwell for four years. She believes that the probe is helpful in terms of screening for oral cancer, but that its primary benefit comes from its assistance during surgery.

"It can increase specificity in screening and identifying patients who have malignant transformations in oral cavities," Marcu said.

Marcu, like Farwell, said the main causes of oral cancer can be attributed to smoking primarily, but that cancerous diagnoses as a result of HPV are increasing. She believes that it is important to treat the cancer early, and that the fluorescent probe can help.

"It's not just the fact that [oral cancer] is deadly, but that it impacts the oral cavities, causing the diminishment of the person's life," she said.

Marcu said that many people are developing oral cancer in their 30s as a result of HPV. Farwell said this could also be attributed to the sexual revolution of the late 20th century.

HPV, a sexually transmitted virus, is similar to the virus strain of cervical cancer that women develop, Farwell said. He believes that HPV will receive much more attention from the public in the next few years, due to the drastic increases — that are rapidly approaching tobacco in terms of figures for cases of oral cancer caused — of HPV-induced diagnoses.

Research results are already being published, as the probe has been the focus of increased attention. If successful, the probe could greatly increase the number of screenings for oral cancer by practitioners and dentists alike.

Farwell believes that the progress made with this probe is a reflection of the quality of the UC Davis Medical Center.

"It is a great example of the collaborative atmosphere we have in place here; a place where doctors from various backgrounds can work together for a common goal," Farwell said.

For more information on the research being done by the UC Davis Medical Center, visit ucdmc.ucdavis.edu/medicalcenter.

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