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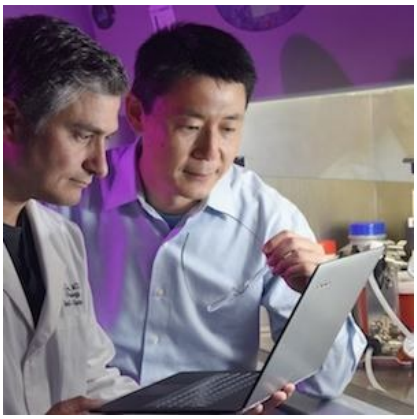
Study: New Nanosensor Improves Cancer Surgery



A transistor-like threshold sensor that can illuminate cancer tissue has been developed by researchers from UT Southwestern Medical Center. With this nanosensor, surgeons will be able to more accurately distinguish cancerous from normal tissue, according to the new study published in Nature Biomedical Engineering.

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The research team was able to demonstrate the ability of the nanosensor to illuminate tumour tissue in experiments with different mouse models. “We synthesised an imaging probe that stays dark in normal tissues but switches on like a light bulb when it reaches solid tumours. The purpose is to allow surgeons to see tumours better during surgery,” explains senior author Dr. Jinming Gao, Professor of Oncology, Pharmacology and Otolaryngology with the Harold C. Simmons Comprehensive Cancer Center.

Tumours do not have the same pH as normal tissue. What the nanosensor does is amplify pH signals in tumour cells to more accurately distinguish them from normal cells. "Tumours are acidic, and they secrete acids into the surrounding tissue. It’s a very consistent difference and was discovered in the 1920s,” says Dr. Baran Sumer, Associate Professor of Otolaryngology, and co-senior author of the study.

Dr. Sumer also explains how the improved surgical technology can eventually benefit cancer patients in many ways. “This new digital nanosensor-guided surgery potentially has several advantages for patients, including more accurate removal of tumours, and greater preservation of functional normal tissues,” he says. “These advantages can improve both survival and quality of life.”

For example, this technology may help cancer patients who face side effects such as incontinence after rectal cancer surgery.

In addition, the new technology may be able to assist radiologists by helping them to reduce false rates in imaging, and assist cancer researchers with non-invasive monitoring of drug responses, according to Dr. Gao.

Data from the National Cancer Institute show there are 15.5 million cancer survivors in the U.S., representing 4.8 percent of the population. The number of cancer survivors is projected to increase by 31 percent, to 20.3 million, by 2026.

Source & Image Credit: UT Southwestern Medical Center

Published on : Sat, 24 Dec 2016