

## TAKING THE GUESSWORK OUT OF CANCER SURGERY

In 2016, nearly 1.7 million people in the United States alone will be diagnosed with cancer. For many of these people, treatment will involve surgery to remove the cancer. However, because it's very difficult for the naked eye to distinguish between normal tissue and cancerous tissue, standard protocol requires doctors to remove the tumor as well as some surrounding tissue. If this tissue is found to contain cancer cells, which can happen in as high as 40 percent of cases, the patient often faces a second round of surgery. Samuel Achilefu and his research team at Washington University in St. Louis have developed a simple, but powerful solution that might significantly improve these odds. Their cancer goggles, used with a special imaging dye also developed by Achilefu, illuminate cancer cells and make it easier for surgeons to remove all of the cancer the first time around.

Dr. Achilefu, the Michel M. Ter-Pogossian Professor of Radiology at Washington University School of Medicine, explains that dye injected into the patient binds to the cancer cells and emits a light undetectable by the human eye. With the goggles on and an infrared light shining on the tumor, the only light a surgeon sees is that emitted from the cancer cells, clearly illuminating the tissue that needs to be removed. This system also enables doctors to see cancerous cells in places beyond the target tumor — cells that would have been overlooked because they are too small to have been identified by traditional imaging techniques prior to surgery.

Improving cancer treatment, relieving patient anxiety, and reducing health care costs here in the United States, are clear potential

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# CANCER SURGERY

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benefits of the cancer goggles. However, the Nigerian native also has his eye on improving treatment options for people in less developed parts of the world. "One of my biggest joys would be to see this technology go to people who cannot afford good health care. The beauty of our system is that it can be used in the most advanced centers like Washington University in St. Louis, and it can be used in the most rural areas of the world."

The cancer goggles have been successfully used in a pilot study at Washington University's Siteman Cancer Center on patients with breast, skin and liver cancers. As of September 2016, Dr. Achilefu is awaiting U.S. Food and Drug Administration (FDA) approval to allow other institutions to evaluate the technology in clinical trials. He also is in the process of submitting an investigational new drug (IND) application to the FDA for the imaging dye.

Funding for Dr. Achilefu's work has come from a variety of public and private sources. However, he says that funding from the National Institutes of Health and other federal agencies has been absolutely essential to moving his cancer goggles from concept to reality. Moreover, he says that it's only through continued federal funding of research that future innovations will evolve.



PHOTOS COURTESY OF ROBERT BOSTON, WASHINGTON UNIVERSITY SCHOOL OF MEDICINE IN ST. LOUIS

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