

Testing fluorescent tracers used to help surgeons determine edges of breast cancer tumors

September 20 2018, by Bob Yirka



Three-dimensional culture of human breast cancer cells, with DNA stained blue and a protein in the cell surface membrane stained green. Image created in 2014 by Tom Misteli, Ph.D., and Karen Meaburn, Ph.D. at the NIH IRP.

A team of researchers with members from institutions in The Netherlands and China has conducted a test of fluorescent tracers meant to aid surgeons performing tumor removal in breast cancer patients. In their paper published in the journal *Nature Communications*, the group describes the study they carried out and what they found.

Breast [cancer](#) patients who undergo [tumor](#) removal surgery are often left with less healthy breast tissue than need be—this is because surgeons routinely remove an extra centimeter of tissue around the perimeter of a tumor as a precaution against leaving behind hidden [cancerous cells](#). Even so, approximately 20 percent of such patients must undergo a second procedure for removal of tumor tissue that was missed. The problem occurs because cancerous cells are often difficult to see—surgeons quite often must resort to using their fingers to find tiny lumps. Because of this, medical researchers have been working on developing fluorescent tracers to improve accuracy. As their name suggests, fluorescent tracers are elements introduced into the body to induce fluorescence in cancer cells, making them easier to see. The authors with this new study noticed that despite a lot of work in this area, no one had actually tested whether using such tracers would actually improve surgical results. For that reason, they designed a relevant study.

The study consisted of first creating a tracer using a compound called 8000C that could be delivered via a cancer drug already in use—bevacizumab. Next, the team enlisted the assistance of 26 female volunteers (and their surgical teams) who were already scheduled for tumor removal. Each was given the tracer prior to their surgery. The researchers then looked at video of the surgeries and compared what they saw with pathology reports. They report that eight of the patients still had remaining cancer cells post-surgery. They further report that the tracer correctly identified those cancerous remnants in seven of those eight patients. Unfortunately, the tracer also highlighted (though very weakly) [cells](#) in two patients that were later found to be non-cancerous.

The researchers conclude their analysis by suggesting that using fluorescent tracers in breast [tumor removal](#) appears to offer benefits that offset drawbacks.

More information: Marjory Koller et al. Implementation and benchmarking of a novel analytical framework to clinically evaluate tumor-specific fluorescent tracers, *Nature Communications* (2018). [DOI: 10.1038/s41467-018-05727-y](#)

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