Researchers create tool to help unravel secrets of cancer

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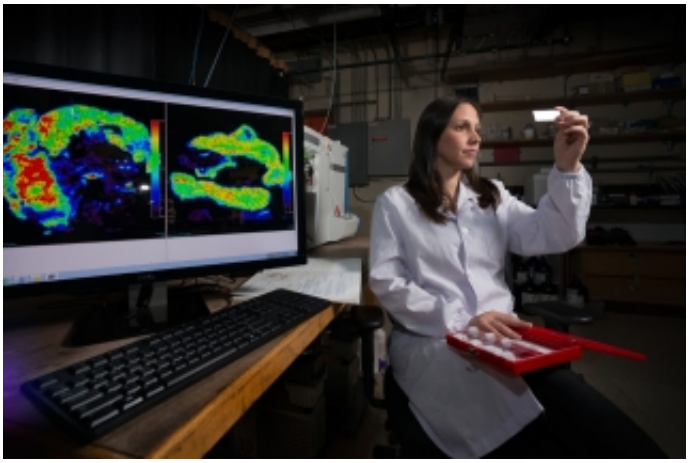

Livia Eberlin is the lead researcher of a project examining the biological signatures in cancer cells. Credit: Linda A. Cicero/Stanford News Service

An interdisciplinary team of chemists, oncologists and one statistician at Stanford has taken the first step toward developing a technique that can identify the origin of certain types of cancer—a potential boon to doctors prescribing therapies for their patients.

The researchers' findings were published July 3 in the *Proceedings of the National Academy of Sciences.*

"The same cancer can occur because of different genes, but in certain cases the aggressiveness and the type of treatment actually depend a lot

on what oncogene caused that cancer," said Livia Eberlin, PhD, a postdoctoral scholar in chemistry and lead author of the paper.

An oncogene is a normal gene that has mutated, causing cells to become cancerous. In this study, the team members looked at one that is related to lymphoma and responsible for approximately half of all human cancers. They wanted to find a biological signature that would trace the mutating cancer cells back to the original oncogene.

"When cancer takes place, the cell loves to gobble up glucose—that's a sugar—and glutamine," said Richard Zare, PhD, professor of chemistry and senior author of the paper, who served as an adviser to Eberlin. "It takes those and makes different lipids—different fatty molecules than what it normally makes."

Diagnostic and prognostic

Using an statistical method from co-author Robert Tibshirani, PhD, professor of health research and policy and of statistics, the team was able to identify not just one but 86 lipids that can be traced back to an oncogene.

"It's not just diagnostic," Eberlin said. "It gives extra information that could be prognostic."

Depending on the bio-signature of the cancer cells, physicians will have a better idea of the aggressiveness of a patient's cancer. In the future, this research may lead to a better knowledge of cancer in general.

"The next step is to use this as a way to figure out the causal mechanism," said Dean Felsher, MD, PhD, professor of medicine and of pathology and a co-author of the paper. "Though the connection between the cancer cells and their origin is clear, the actual cause of cancer—the

biological trigger that pushes cancer to progress—is still mysterious.

As Zare mused, "How does cancer really work? This is a tool to understand the nature of how cancer progresses."

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