

Two new compounds show promise for eliminating breast cancer tumors

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Two new compounds created by a University of Central Florida professor show early promise for destroying breast cancer tumors.

Associate Professor James Turkson's compounds disrupt the formation and spread of breast cancer tumors in tests on mice. The compounds, S3I-201 and S3I-M2001, break up a cancer-causing protein called STAT3, and researchers have observed no negative side effects so far.

"The compounds are very promising," Turkson said. "They've worked very well in mice, and now we're looking for partners to help us take these compounds to the next level of trials."

Turkson's research has been published in the academic journals Proceedings of the National Academy of Sciences and ACS Chemical Biology, and he has obtained patents for both compounds.

Turkson is passionate about his research and has a very personal reason for wanting to find a cure for cancer. During his first year of college, his 52-year-old mother was diagnosed with uterine cancer and died. He dedicated his life to finding a cure.

The two compounds developed in his lab hold promise in part because they efficiently disrupt the abnormally active STAT3 protein he said.

"We all have the STAT3 protein in our bodies, and under normal circumstances it causes no harm. But in breast cancer patients, the

protein is abnormally active. It never shuts off."

When that happens, the protein goes into overdrive and is bent on supporting the proliferation of breast cancer cells. The protein even creates a network of blood vessels to feed the cancer cells, support their growth and eventually promote the spread of the cancer into the blood, bones and organs.

"Our compounds go after STAT3, stripping away its power," Turkson said.

Both compounds disrupt the bonding process that one STAT3 molecule goes through to connect with another in the body. If the STAT3 can't bond to stay abnormally-active, cancer cells can't develop. The network of blood vessels that formed to feed the cancer cells also shuts off.

Left without their source of food, the existing cancer cells die off. The body's immune system, which until now has been tricked by the abnormally active STAT3 into thinking the tumor cells are harmless, also recognizes that something is wrong. The immune system re-activates, recognizes any remaining cancer cells as harmful and destroys them.

Turkson worked with researchers at the H. Lee Moffitt Cancer Center and Research Institute, and the Beckman Research Institute and the Comprehensive Cancer Center of the City of Hope National Medical Center.

Turkson is a native of Ghana, West Africa. He completed his studies and obtained his honors B.S. degree in Biochemistry with Chemistry at the University of Ghana. He earned a Ph.D. in Pharmacology from the University of Alberta in Canada.

He completed post-doctoral fellow training in Molecular Oncology at the

H. Lee Moffitt Cancer Center and Research Institute in Tampa, where he served as an assistant professor before joining UCF's Burnett School of Biomedical Sciences in 2005.

While Turkson continues to look for partners to further his research, he's already working on a similar compound for pancreatic cancer.

In that case the compound would enhance the potency of another drug and use the body's immune system to make the effect more powerful.

Source: University of Central Florida

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