

New infrared light may open new frontier in fighting cancer, Tay Sachs

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A "game-changing" technique using near infrared light enables scientists to look deeper into the guts of cells, potentially opening up a new frontier in the fights against cancer and many other diseases.

University of Central Florida chemists, led by Professor Kevin Belfield, used near [infrared light](#) and fluorescent dye to take pictures of cells and tumors deep within tissue. The probes specifically target [lysosomes](#), which act as cells' thermostats and waste processors and which have been linked to a variety of diseases, including types of mental illnesses and cancers.

The probes can be adapted to search for certain proteins found in tumors, which means they someday may help doctors diagnose and potentially treat tumors.

"This is a game-changer," Belfield said. "Until now, there was no real way to study lysosomes because existing techniques have severe limitations. But the probe we developed is stable, which allows for longer periods of imaging."

Current imaging probes work for only a few minutes. They cannot penetrate [deep tissue](#), are sensitive to pH levels and have poor water solubility. Belfield's technique gets around those problems by using near infrared light. Once researchers identified the correct light frequency, they took images of lysosomes for hours.

The new approach will allow researchers to see lysosomes at work and to piece together their role in diseases such as cancer and Tay-Sachs, a [genetic disorder](#) from which children typically die by age 4.

"We've come up with something that should make a huge difference in finding answers to some very complicated conditions," Belfield said.

Belfield's findings are published in this month's [Journal of the American Chemical Society](#).

Provided by University of Central Florida

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