New glow-in-the-dark material can track path of drugs through the human body

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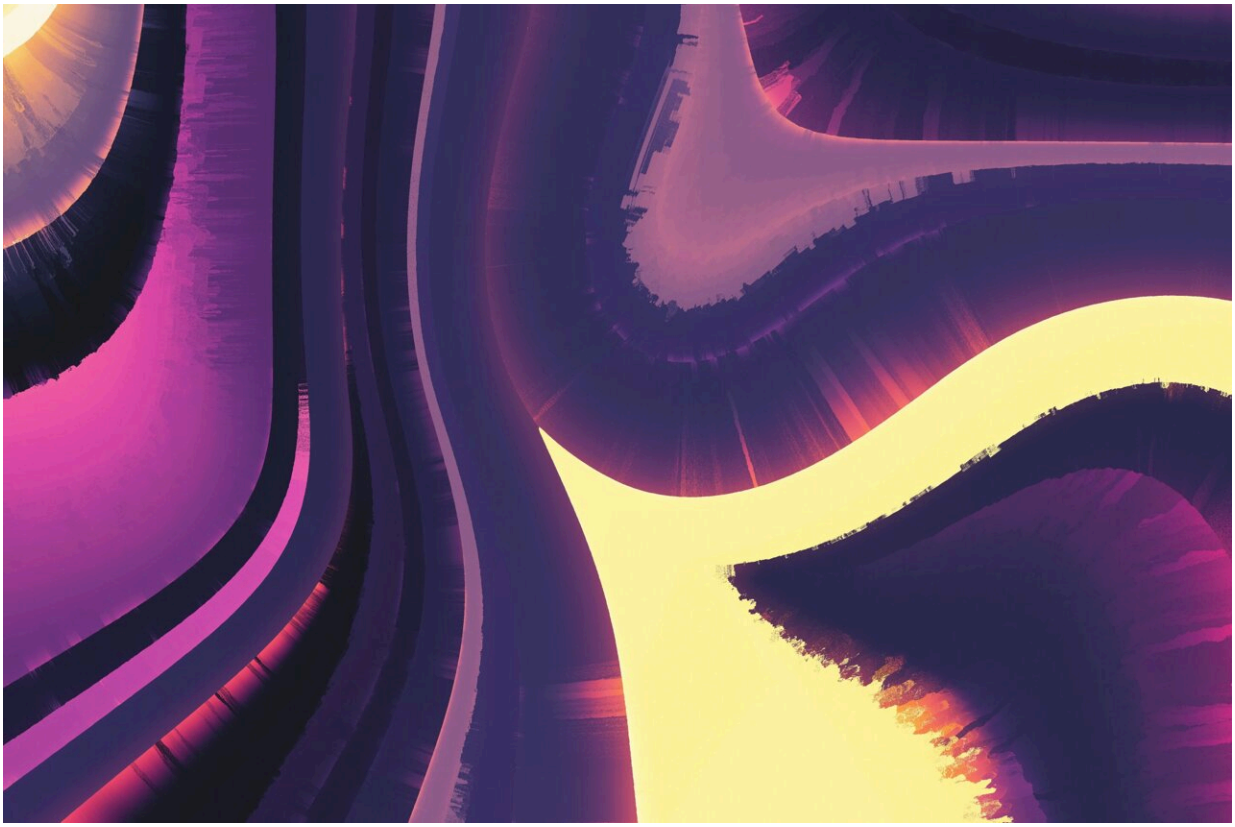

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Researchers from Western University have developed a material that could eventually improve the way drugs are administered to patients, by allowing doctors to "see" exactly whether drugs are reaching the targets

and working properly.

By combining a material already used to deliver medication to specific sites in the body with another that glows in the dark (optical probe), Assistant Professor Lijia Liu and graduate student Ellie W.T Shiu have created a composite that can be used to track the path of a drug carrier through the human body. In the short term, the new approach could be used to monitor medication used for cancer and bone diseases—but it could eventually have a wide range of therapeutic applications.

With the help of the Canadian Light Source (CLS) at the University of Saskatchewan (USask), Shiu and Liu were able to see the interaction between the luminescent optical system and the drug carrier. Their findings were recently published in the journal *Physical Chemistry Chemical Physics*.

"Our optical probe is kind of like glow-in-the-dark paint or when you walk into a club wearing those [glow-stick] bracelets, and you can still see the light," says Liu.

The probe designed by Liu and Shiu emits near infrared light and can be tracked by standard bioimaging techniques. This system is safer than other probes which need a source of radiation to produce light.

This impressive research began as an undergraduate project for Shiu, who is currently a master's student in Liu's lab. Shiu was able to collaborate with CLS scientists who helped her conduct experiments remotely.

"I did gain a lot of insight from the meaningful conversations with the scientists at the CLS," says Shiu.

There are elements of Liu and Shiu's research that cannot be achieved

without the use of synchrotron technology.

"There is one particular technique that can only be done at a synchrotron, and that piece of the puzzle is very important in terms of understanding the structure of our materials," says Liu.

More information: Wai-Tung Shiu et al, Synthesis and characterization of a near-infrared persistent luminescent Cr-doped zinc gallate–calcium phosphate composite, *Physical Chemistry Chemical Physics* (2022). DOI: 10.1039/D2CP03431J

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