

# New fluorescent biosensor detects glyphosate herbicide in soil, water samples

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The fluorescent biosensor created by Shahir S. Rizk of IU South Bend can detect glyphosate below the federally mandated levels for drinking water in the U.S.  
Credit: Shahir S. Rizk

A researcher at Indiana University South Bend and his undergraduate students have developed a biosensor that could potentially be incorporated into devices that continuously monitor for a popular herbicide during food screening or water and soil treatment.

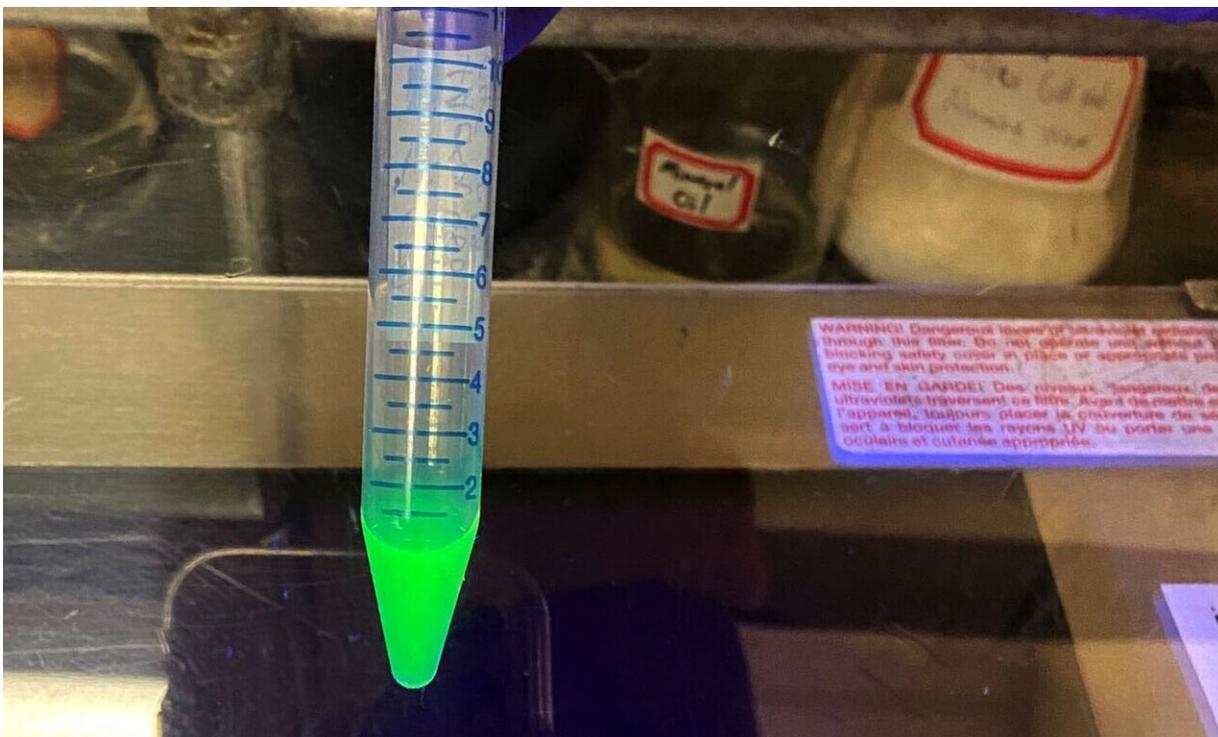
Shahir S. Rizk's biosensor detects glyphosate, which has been found to significantly increase the risk of developing non-Hodgkin lymphoma, a cancer of the immune system.

"Our sensor is based on a protein from bacteria that our lab has re-engineered to bind to glyphosate," Rizk said. "When glyphosate is detected, the sensor produces a fluorescent light signal that can be detected and used to quantify how much glyphosate is in a sample."

Rizk said glyphosate is the most widely used herbicide in the United States. More than 180 million pounds are used annually, mostly in the Midwest in agricultural applications. He said current methods to detect the herbicide have drawbacks that limit real-time detection.

"They require bulky lab equipment, and testing large numbers of samples is challenging, costly and time-consuming," Rizk said. "The [fluorescent biosensor](#) can detect glyphosate in water and soil samples with high specificity. It can also detect it below the federally mandated levels for drinking water in the U.S."

Rizk said the next step is to find industry partners to help develop the biosensor into a device to be used for field detection of [glyphosate](#). He disclosed the innovation to the IU Innovation and Commercialization Office, which applied for a patent from the U.S. Patent and Trademark Office.



The biosensor created by Shahir S. Rizk of IU South Bend produces a fluorescent light signal that can quantify how much glyphosate is in a sample.  
Credit: Shahir S. Rizk

Provided by Indiana University

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