



Simple Biological Method and Device for Detecting a Toxin or Other Chemical

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WARF: P06373US

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a simple biological sensing method that uses the elastic instability of swelling hydrogels to act as a trigger to detect toxins or other chemical compounds.

Overview

Most schemes for detecting toxins or other chemicals are based on complex electronic, photonic and/or electrochemical methods, or on more elegant biomolecular methods, such as ELISA (Enzyme-Linked Immunosorbent Assay). Because these methods are generally expensive and complicated, a need remains for practical, cost-effective biosensors.

The Invention

UW-Madison researchers have developed a simple biological sensing method that can be used to detect toxins or other chemical compounds. The technology uses the elastic instability of swelling hydrogels to act as a trigger when contacted by a designated stimulus, such as a particular chemical.

Two different types of hydrogels are bonded together by a sensitive material, such as a degradable adhesive material specific to a certain enzyme or chemical. The hydrogels swell at different rates, causing them to bend. Because the adhesive restricts the motion of the hydrogels, an elastic force is generated. When the adhesive material contacts the target chemical, the adhesive degrades, releasing the elastic instability and causing the two hydrogels to separate with an explosive motion that is detectable by the naked eye.

Applications

- Creation of simple dipstick sensors to detect toxins, enzymes or chemicals

Key Benefits

- Does not require external power sources
- Sensors may be portable or disposable.
- Highly sensitive and selective
- Rapid response time
- Generates few false alarms
- Simple to use
- Easy to manufacture
- Signal is easily observable.

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For More Information About the Inventors

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Tech Fields

- [Analytical Instrumentation, Methods & Materials : Sensors](#)
- [Research Tools : Detection](#)

For current licensing status, please contact Jeanine Burmania at jeanine@warf.org or 608-960-9846

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