Bioagent Detection Device

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing an inexpensive, real-time wireless microsensor for detecting biological agents in water supply networks and other aqueous environments such as the milk supply.

Overview

Because potential biological attacks against civilian populations have become an important issue for homeland security, practical and efficient biosensors are needed. However, no currently available biosensor systems are capable of detecting biological agents in real time.

The Invention

UW-Madison researchers have developed an inexpensive, real-time wireless microsensor for detecting biological agents in water supply networks and other aqueous environments such as the milk supply. This system includes a microdevice composed of a sampling chamber and a capacitor chamber connected by a channel. A biosensitive membrane blocks the channel between the two chambers.

To detect a biological agent, a sample of fluid is introduced into the sampling chamber and contacts the membrane. If a target bioagent is present in the fluid, it causes the membrane to become permeable or even to dissolve. When this occurs, fluid flows from the sampling chamber into the capacitor chamber, creating a very large change in impedance and an extremely large electrical output signal. The output signal is then wirelessly transmitted to a device that alerts the user to the presence of the target bioagent.

Applications

- Detection of biological agents

Key Benefits

- Highly sensitive and selective
- Generates few false alarms
- Output electrical signal does not need to be amplified, unlike in other systems which use expensive, bulky devices that consume lots of power
- Takes advantage of the large difference in dielectric properties between fluid and air to keep the device small and lightweight while still producing a large output signal
- Inexpensive to manufacture
- Potential to detect the presence of multiple biological agents for which the appropriate chemistry is available
- Can communicate wirelessly over a large area

Additional Information

For More Information About the Inventors

- Hongrui Jiang
- David Beebe

Tech Fields

- Analytical Instrumentation, Methods & Materials : Biodefense
- Animals, Agriculture & Food : Food safety & quality
- Clean Technology : Monitoring, remediation & waste reduction

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