

# A new detection system can reveal bioterrorist attacks on our water supply network

May 9 2011, by Annette Oestrand

---



If pathogens enter into our water supply network many people may fall ill quickly. To protect us against this biological threat, researchers have developed a detection system partly based on nanotechnology that can warn authorities in time.

In the 21st century several countries have suffered great losses after terrorist attacks. Although the risk of bioterrorist attacks or accidental contamination of our water supply network is low, the consequences could be fatal. Researchers connected to DINAMICS (DIagnostic NAnotech and MICrotech Sensors), a project co-funded by the European commission, have made a lab-on-a-chip device that can

monitor our [drinking water](#) and spot different pathogens even at very low concentrations.

The device uses sensors with very small strands of different pathogenic [DNA](#) integrated onto their surfaces to quickly recognize pathogenic DNA from water samples. The DNA in the sensors will only bind to the water samples' corresponding DNA, multiplied for easier identification. To see what different DNAs are present in the water samples, the researchers apply a reaction called chemiluminescence that will make the bound DNAs emit light. The nanoscale reactions are then interpreted by a computer. The DINAMICS project's researchers have also developed another type of sensor that changes the bound DNAs into electric signals. The signal's magnitude is proportional to the quantity of pathogenic DNA from the water sample.

At present, water samples are brought to the laboratory for analysis. The researchers' goal is to make this step redundant by bringing the laboratory to the water instead, since the device is part of a portable detection system. This would speed up the process substantially. If the system detects a biological threat the authorities can be informed through email or mobile phone.

Another way of spotting accidental or deliberate water contamination has been developed by the Fraunhofer Institute in Germany. By also recognizing that existing methods for water analysis are time-consuming they have set up a system called AquaBioTox, which uses living microorganisms. A sensitive camera system continuously records and analyses the microorganisms' reactions to the water. Even though the researchers have documented a reliable and fast detection of contaminants, to guarantee robustness against false alarm and maximum reliability in diagnosis they recommend that the system is combined with other sensors on the market.

The DINAMICS project is planned to end the last day of March and if the system becomes widely available in the water industry this more cost-efficient way of testing could significantly improve [water](#) safety, alone or in combination with other [sensors](#).

Provided by Youris.com

Citation: A new detection system can reveal bioterrorist attacks on our water supply network (2011, May 9) retrieved 9 April 2024 from <https://phys.org/news/2011-05-reveal-bioterrorist-network.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--