



With News & Classifieds From: **The Post-Standard**



NEWSPAPER SEARCH

FIND A BUSINESS

- Home
- News+Biz
- Local
- Sports
- Forums+Chat
- Cams+Radio
- Living
- Entertainment

### CLASSIFIEDS

*Get The Best Local...*  
[Jobs](#) | [Autos](#) | [Real Estate](#)  
[All Classifieds](#) | [Place An Ad](#)

» [Win a night at Mirbeau Inn & Spa](#)

### CNY Business

- » [DestiNY USA Updates](#)
- » [DestiNY USA Forum](#)
- » [Mortgage Rates](#)
- » [Stock Market Report](#)
- » [CNY Business Forum](#)

- » Research New Autos
- » Find a Used Auto
- » Run an Auto History Report



#### MORE SEARCHES

##### Classifieds

- » [Jobs](#)
- » [Autos](#)
- » [Real Estate](#)
- » [All Classifieds](#)

##### Obituaries

- » [Obituaries & Guest Books](#)

##### Local Businesses

- » [Find A Business](#)

##### Entertainment

- » [Movies](#)
- » [Music](#)
- » [Arts & Events](#)
- » [Dining & Bars](#)

##### Local Web Sites

- » [Community Connection](#)

- >> [M & T Bank's Everyday Banking Solutions](#)
- >> [Selling your home? Sign up for a free home evaluation from Coldwell Banker Prime Properties](#)

» [Advertise With Us](#)

**WAER jazz 88**

# Search

[Back To Your Search Results](#) | [Search Again](#)

# The Post-Standard

Click here to subscribe!

» [More From The Post-Standard](#)

## Homeland Detective

April 20, 2003

By **Tim Knauss**  
Staff writer

Until recently, the only terrorists Greg Boyer grappled with were primitive one-celled organisms.

When a dog dies from ingesting water from Lake Champlain during a bloom of blue-green algae, for example, Boyer is the researcher called to identify the killer toxin. A biochemist at SUNY College of Environmental Science and Forestry, Boyer has studied algal toxins for 25 years.

Now fears of terrorism have propelled Boyer, several of his university colleagues and two local businesses into a venture to protect water supplies from all sorts of chemical and biological poisons.

Under the name Source Sentinel LLC - a partnership started by the college, engineering company O'Brien & Gere and Illumination Technologies of DeWitt - the entrepreneurs are trying to develop cutting-edge sensors to provide continuous, real-time monitoring of water systems.

The goal is to create the equivalent of a smoke detector for water-borne poisons - something simpler, quicker and more effective than the repeated sampling and lab tests that would be required to do the same job today.

▼ Try Our Classifieds

a special offer for new subscribers

SAVE more than 45%

SUNDAY HOME DELIVERY **10 WEEKS \$10**

SUNDAY & DAILY HOME DELIVERY **10 WEEKS \$20**

Click and order online Now!  
**The Post-Standard**

The project is pure homeland security, cooked up in the months after the terror attacks of Sept. 11, 2001, said Cornelius Murphy, president of the college and a former president of O'Brien & Gere.

Already, the researchers have garnered \$1.1 million in state and federal aid aimed at promoting homeland security.

U.S. Rep. James Walsh, R-Onondaga, helped secure \$725,000 from the Department of Health and Human Services in February. Gov. George Pataki steered another \$300,000 to the project in March, on top of \$75,000 the state provided last year for a feasibility study.

But if Source Sentinel succeeds, its technology might have uses far beyond homeland security.

Murphy, Boyer and others involved in the project talk about the potential to monitor water supplies in developing countries for cholera, to monitor packages of ground beef for bacteria or to monitor building air systems for toxic chemicals or germs.

"There's actually a larger need and more social benefit to the non-bioterrorism aspects of this technology," said Mike Muehlemann, president of Illumination Technologies. "But it's like anything else, you know. People need a motivator to work and spend money on something."

The proving ground for the new technology will be water systems.

Murphy said college officials have been contacted by several large water systems expressing interest in the technology, including those of New York City and Los Angeles. Representatives from Source Sentinel plan to meet next month with New York City water officials to discuss the possibility of deploying the system at Upstate reservoirs serving the city, Murphy said.

But the ideal first customer would be a water system in Central New York, so Source Sentinel can work out the bugs close to home, Murphy said.

Murphy said the promised state and federal money should be in hand by June, at which point Source Sentinel can start hiring people. A formal business plan for the company will be solidified over the next couple of months, said Terry Brown, president of O'Brien & Gere.

**Until then**, representatives from the three entities meet routinely in an executive committee headed by Terry Madden, a senior vice president of O'Brien & Gere. Madden is likely to become president of Source Sentinel when the company begins operating independently, Murphy said.

A key element of the technology Source Sentinel is making will be a dime-sized "bio-chip" that combines biological probes such as antibodies with a laser running over an optical circuit.

Boyer and other researchers at SUNY ESF are developing antibodies, polymers and other compounds, each of which bonds with a specific toxin.

Muehlemann and his cohorts at Illumination Technologies take those compounds and integrate them into a tiny optical circuit, so small that 20 circuits could fit on a chip the size of a dime.

If a toxin in the water bonds chemically with its associated antibody or probe, the path of the laser will be altered, triggering an alert. The more toxin present, the stronger the reading.

It's an automated version of the immunoassay, a standard test used to identify diseases or compounds that trigger immune responses.

"We're marrying physics and biology," Muehlemann said.

**The chips** would have a service life of a week or two, and would be replaced automatically.

The bio-chips are being developed and are probably 12 to 18 months away from being deployed, said Muehlemann. Source Sentinel hopes to raise another \$1 million or so - either from the government or from investors - to hasten development, he said.

ESF has several proposals for aid before federal agencies, Murphy said.

The bio-chips would be used in conjunction with other types of sensors that are available. Until the bio-chips are ready, Source Sentinel plans to monitor water systems using existing technology.

By November, the company hopes to have at least one monitoring station up and running.

Until then, the challenge will be to transmit information from the sensors to a computer network, where "smart management" software will analyze the data and tell the water system operator how to respond. That part of the system will be developed mainly by O'Brien & Gere, Murphy said.

**Initially, the** Source Sentinel apparatus would be deployed from a buoy, probably at a point where water enters a municipal system. The buoy, manufactured by a Minnesota company, contains solar panels to power the on-board electronics and transmits data using cellular or satellite communications.

Suspended in the water beneath the buoy would be several off-the-shelf instruments: ion selective probes, which can detect inorganic poisons such as cyanide; a gas chromatograph/mass spectrometer, which detects organic compounds such as pesticides or solvents; and other sensors that detect DNA content, an indicator of bacterial or viral contamination.

All together, one such apparatus would probably cost between \$1 million and \$2 million, Murphy said.

Eventually, Source Sentinel hopes to adapt its technology so that sensors could be located at a variety of points within a water system - perhaps, someday, even at the water intakes of individual buildings. That's because the probability of causing death or illness by poisoning a water system would increase the closer to an end-user the poison were introduced. Toxins poured into a large reservoir would be greatly diluted by the time they flowed through the system.

"There is a need for buoys, in combination with distribution system monitoring. But the largest market, and the most critical need, is distribution monitoring as opposed to buoy monitoring," Muehlemann said.

In theory, the bio-chips being developed by Source Sentinel should be adaptable to uses beyond water monitoring.

Murphy suggested that a chip could be implanted on the plastic wrap around a package of hamburger to alert customers to bacterial contamination. Brown said the same technology could be used to monitor

indoor air quality.

**For now**, though, Source Sentinel is focusing on developing sensors for toxins that pose particular threats to water systems.

And when it comes to poisoning a water supply, few agents are more effective than cyanobacteria.

Commonly called blue-green algae, cyanobacteria are not true algae but a form of bacteria. They usually appear green because they contain chlorophyll, and make food through photosynthesis.

In fresh water, you may know cyanobacteria as pond scum.

Toxins produced by strains of cyanobacteria can be 1,000 times more potent than cyanide, said Boyer, who has been studying them for decades. In addition to being potential tools of terrorists, the toxins already make their way into water systems naturally.

In Lake Champlain, toxins produced by cyanobacteria - anatoxin-a, a nerve agent, and microcystin, which attacks the liver - have caused the deaths of several dogs in recent years, Boyer said.

**Saxitoxin, another** nerve poison produced by certain varieties of saltwater algae and by freshwater cyanobacteria, was researched as a biochemical weapon by both the United States and the Soviet Union during the early days of the Cold War. Eating shellfish contaminated by saxitoxin causes the sometimes fatal illness called paralytic shellfish poisoning.

Toxins produced by cyanobacteria are present in about one-third of some 150 New York lakes and reservoirs that have been tested, although not necessarily in numbers high enough to cause concern, Boyer said. Even before Sept. 11, 2001, Boyer was working on methods to monitor those toxins in the Great Lakes, under a \$3.2 million grant from the National Oceanic and Atmospheric Administration.

"Since we know these things occur naturally anyway, you don't even have to have a terrorist event for it to be an issue," Boyer said.

© 2003 The Post-Standard. Used with permission.

[The Best Local Classifieds: Jobs](#) | [Autos](#) | [Real Estate](#) | [Place An Ad](#)



Subscribe to The Post-Standard today and get incredible savings off home delivery! [Subscribe Now!](#)

[About Us](#) | [Help/Feedback](#) | [Advertise With Us](#)

Use of this site constitutes acceptance of our [User Agreement](#). Please read our [Privacy Policy](#).

©2003 [Syracuse.com](#). All Rights Reserved.

