

# NanoTechLabs' Sensors



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Information is a highly valuable commodity, and of all types, information concerning our surroundings and environment is of the utmost importance. If we lost the ability to input information concerning our surroundings, we would be without function or direction.

Environmental input is a universal requirement, shared among all living things as well as high-functioning machines and devices.

Devices that gather information are collectively known as sensors, and there are countless numbers employed in a diverse range of applications, environments, and circumstances. The biological senses we possess are highly advanced and quite difficult to reproduce in the laboratory. However, synthetic sensors are growing in ability and precision as the need for timely and large-area environmental information increases.

Using nanomaterials and advanced electronics, NanoTechLabs sensors are developed in conjunction with Foster-Miller and Infoscitex (corporate collaborative research partners). NanoTechLabs' sensors are:

- Capable of detecting single biological entities, chemicals, and radiological particles (any microbe, molecule, or pathogen with a formulated antibody or binding peptide can be detected in singular amounts. In addition, chemicals with known receptors, and particles with formulated excitation energies can be sensed to single activities.)
- Capable of continuous monitoring of "soft targets" and generating immediate results
- Easily combined into multi-dimensional arrays
- Less prone to fouling thereby generating less false positives and fewer false negatives
- More disposable than competitors

## Applications

The applications for NanoTechLabs sensors include:

- Biological homeland defense (see Special Focus section)
- Chemical homeland defense
- Radiological homeland defense
- Rapid throat cultures to improve patient triage
- Monitoring drinking supplies for specific identification of low levels of cholera or typhus bacteria,
- Monitoring plasma glucose levels
- Large-scale sensor networks (telecommunications, monitoring, quality control, etc.)
- Many more

## Special Focus: Bioterrorism

Direct confrontation with the United States military is no longer a viable option for terrorists and most foreign governments. As such, asymmetric approaches including chemical, biological, or radiological terrorism will become a dominant component of future threats. As previous targets become fortified, terrorists will seek out "softer sites", and bioweapons will be the cost-effective method of choice. A NATO report estimated bioweapons cost only \$2.50 to kill unprotected civilians in one square mile.

Currently, the detection of biotoxins is performed through slow, expensive, laboratory-based immunoassay techniques that do not readily lend themselves to continuous monitoring of high density areas such as subway terminals, train stations, airports, shopping centers, national monuments/museums and sporting coliseums. NanoTechLabs' novel,

economical, and highly specific field sensor arrays are capable of detecting low concentrations of Botulinum neurotoxin (BoNT) and other high priority Category A pathogens and would therefore be excellent tools to monitor “soft sites”. (BoNT toxin is the most

poisonous substance known. A single gram of crystalline toxin, evenly dispersed and inhaled, would kill more than 1 million people although technical factors would make such dissemination difficult).

## More Information

For more information about sensors, contact us.

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