

Analytical Biochemistry Technology Transfer in the Field

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EDITORIAL

In an analytical laboratory, detecting and identifying biological macromolecules and organisms such as bacteria and viruses is a difficult task. This scenario allows for thorough sample preparation and analysis while avoiding significant time, instrument size, power availability, and ambient conditions, contamination, and consumables constraints. Indoor laboratory preparation and analysis, on the other hand, are not usually seen as trivial when the detection and identification of biological substances is at stake. Consider the identical situation in an unrestricted outdoor environment. Routine procedures and situations that are taken for granted in an indoor, controlled environment are a blessing when they occur in a field situation.

The element of unpredictability is the only constant that can be guaranteed in an outdoor detection and identification situation using analytical instrumentation. This can happen during detector/identifier operation, weather/climate, operator consistency, reagent performance reliability, and sample-collection procedures. In all parts of an outdoor-based biological investigation, the operator must be always watchful. Depending on whether the biological sample is in an environmental liquid matrix or must be collected from the air as bioaerosols, different issues and relative control approaches are evoked.

In addition to the papers in this issue of Field Analytical Chemistry and Technology, there are some other exciting and intriguing technologies that are now being applied outside of the limits of a laboratory environment. The following are seven handheld biological detection and identification devices, each with a brief summary of the fundamental scientific concept. technologies are

1. MesoSystems Technology, Inc.'s BioCapture BT-550, Richland, WA:

A liquid is used to capture and concentrate bioaerosols. On a test strip, an aliquot of the liquid is deposited.

2. Alexiteric Technologies, LLC's Guardian Bio-Threat Alert Test Strip Reader, Wheeling, IL: The test strip contains antibodies against a specific infection. The strip accepts liquid aliquots of biological substances and runs an environmental screening experiment on them.
3. Analyte 2000, Research International, Woodinville, WA: Fluorophore-labeled antibodies glow in the presence of an evanescent wave from the surface of a glass waveguide support.
4. EAI Corp.'s Biohazard, Abingdon, MD: The whole test kit is made up of individual hand-held, stand-alone instruments such as a luminometer that measures cellular ATP, a fluorimeter that measures DNA, and protein detection and pH measuring devices.
5. Research International, Woodinville, WA: Raptor To detect and identify biological agents, this system employs immunoassay reactions. Furthermore, the Raptor is outfitted with antibodies capable of detecting explosives and chemical pollutants.
6. And Care gadget manufactured by And Care and Becton-Dickinson in Hunt Valley, Maryland. With hybridization procedures, an electrochemical sensor element is employed to detect sample nucleic acid.
7. Lawrence Livermore National Laboratory and Environmental Technologies Group, Inc., Baltimore, MD, developed the Handheld Advanced Nucleic Acid Analyzer (HANAA). This

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