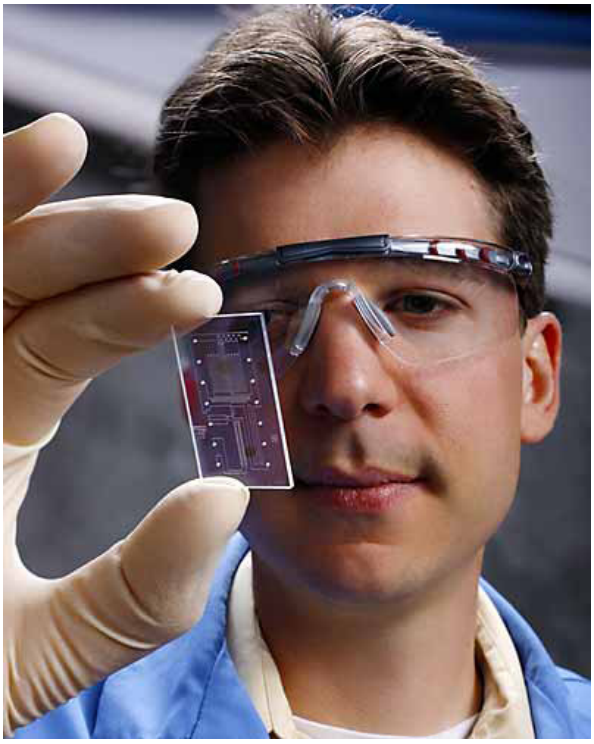
MICRO-PYROLIZER FOR RAPID BIO-IDENTIFICATION

US Pat. No.: 7,087,237
Technology Readiness Level: 4
Basic technological components are integrated to establish that the pieces will work together

Sandia has developed a micro-fabricated device for identifying different organisms by their unique chemical "fingerprint" based on fatty acid (lipid) content. Applications can include food composition testing (e.g. the purity of Extra Virgin Olive Oil), microbe analysis (e.g. Anthrax and virulent bacteria), high value/specialty crop verification (designer seeds, bio-fuels), and unknown substance testing.

Traditional methods for isolating fatty acids for are time-consuming and use large volumes of organic solvents. However, Sandia's micro-pyrolizer quickly turns fatty acids into volatile esters for separation and measurement in a gas chromatograph (GC) or ion mobility spectrometer (IMS). The resulting pattern of relative amounts of fatty acids can identify particular species.

This technology has been shown to be effective in distinguishing bacteria at the gram-type, genera, and sometimes species levels. The chart (left) shows the fatty acid content of two bacteria measured by Sandia's rapid-pryolysis technology.



TECHNICAL BENEFITS

- Microfabricated device suitable for low cost mass production
- Rapid, on-site identification of bio samples
- Requires only tiny sample volumes
- Integrates with lab-on-a-chip style micro-GC

INDUSTRIES & APPLICATIONS

- Agribusiness: crop testing and verification
- Bio-fuels: plants/algae lipid content
- Homeland & national security: bio-agent identification
- Medical: pathogen diagnosis
- Food products: testing virgin vs. adulterated cooking oil

ip.sandia.gov
ip@sandia.gov

Sandia National Laboratories is a multi-mission laboratory managed and operated by National Technology and Engineering Solutions of Sandia, LLC., a wholly owned subsidiary of Honeywell International, Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525. SAND #2010-5837P