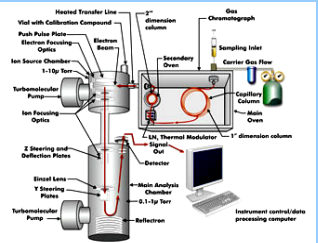




In the Forefront - New Technologies



Comprehensive Two-Dimensional Gas Chromatography with Time-of-Flight Mass Spectrometer (GCxGC-TOFMS)



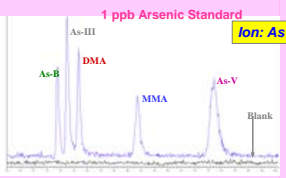
Two-Dimensional Gas Chromatography-GCxGC system is accomplished with a dual-stage, quad-jet thermal modulator positioned between the two columns resulting in a separation of compounds across a plane, rather than just along a line. Capable of identifying thousands of individual components from complex mixtures. Comprehensive quantitative analysis of target analytes. Automated mining of complex GCxGC data to extract previously unidentifiable similarities and differences.

Qualitative analysis with Automated Peak Find and True Signal Deconvolution® algorithms.

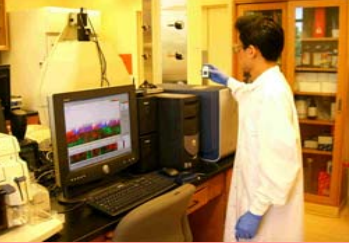
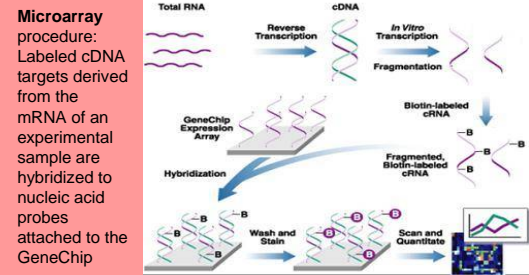
Metals Speciation Analysis by ICPMS-DRC-HPLC Inductively Coupled Plasma-Mass Spectrometer with the Dynamic Reaction Cell technology linked to the High Performance Liquid Chromatography system



Why do Speciation?
 To learn more about a contaminant
 ❖ Bioavailability
 ❖ Toxicity
 ❖ Metabolism
 ❖ Environmental Mobility

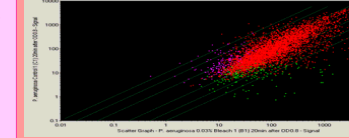


Cutting Edge Microarray Technology



Affymetrix Gene Chip: Contains the entire genome of different pathogenic bacteria of public health significance.

Affymetrix GeneChip Scanner: Used to scan the chip in order to visualize the fluorescence intensities of the spots representing the genes in the entire bacterial genome

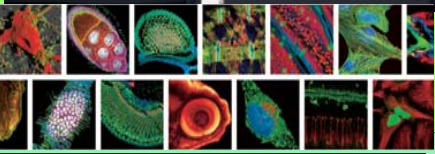
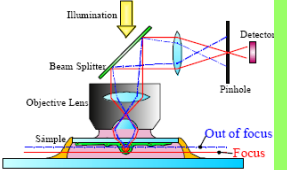
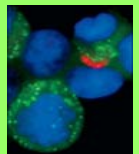


Scatter plot shows the fold changes in gene expression that occur in the bacterial species after disinfectant treatment.

Laser Scanning Confocal Microscope



- High Resolution Fluorescence Imaging
- 3-Dimensional high speed imaging through optical sectioning



Detection of pesticide residues in food by Ultra-high Performance Liquid Chromatography/ Tandem Mass Spectrometry (UPLC-MS/MS)



- ACQUITY UPLC™ 1.7 μm particle size columns for faster speed, higher sensitivity and resolution of analytes.
- Enhanced triple quadrupole mass spectrometer for higher sensitivity, better selectivity and confirmation.
- Analysis of over 400 pesticides in 15 minutes or less.

Permeability of Agricultural Tarps:



- Collaborating with USDA-ARS to develop and validate a new method to test permeability of agricultural tarps to fumigants.
- Headspace analysis of fumigants by gas chromatography/mass spectrometry.
- Generate tarp permeability database for risk assessment and buffer zone credit calculation.
- Outcome may assist EPA to establish rules to reduce emissions and workers exposure to fumigants

Method 1668B -- PCB Congener analysis by High Resolution Mass Spectrometry (HRMS)



- QL of 20 pg/L or 10 pg/g
- PCB congeners provides the most accurate analysis of the total PCBs
- To calculate risks from dioxin-like PCB congeners

