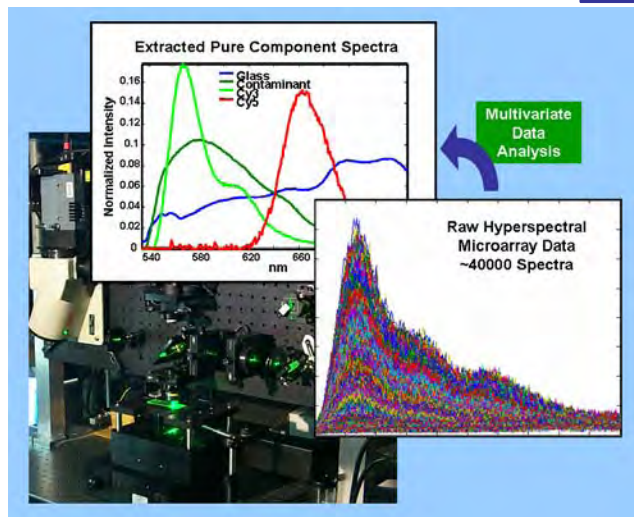


Improving the Reliability of Microarrays for Toxicology Research: A Collaborative Approach

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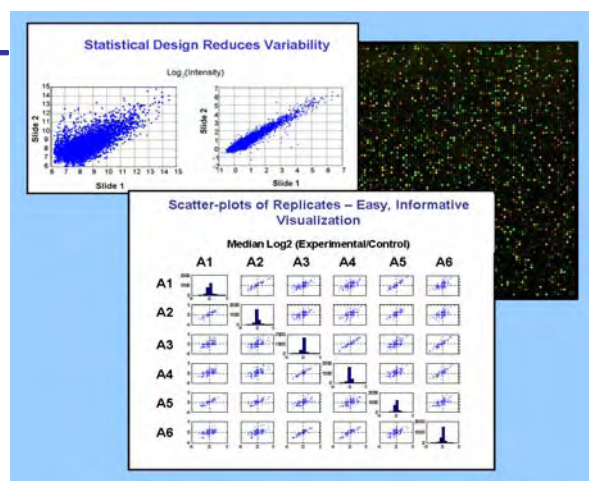
EPA Microarray / Sandia Hyperspectral Scanning



- EPA is developing a *Pimephales promelas* (fathead minnow) microarray as part of Computational Toxicology initiative to develop biomarkers for risk assessments
- Capitalizing on SNL's unique capabilities in hyperspectral imaging (HSI) of microarrays to ensure the highest confidence in EPA microarray data
- HSI performs QC of arrays by identifying and quantitating all emitting species
- Previous studies revealed many arrays possess contaminant emissions that can skew results, HSI is the only analytical technique that can detect and correct for these

Statistical Design and Analysis

- Leveraging EPA strengths in high volume experimental data and SNL strengths in statistical analysis of microarrays to provide improved *Pimephales promelas* array data
- Better facilitates data mining and biomarker identification
- Statistically robust array designs
- Multivariate data analysis
- Improved visualization tools



This integrated approach will permit extraction of highest quality data from a minimal set of experiments, leading to more accurate, more sensitive determination of specific molecular diagnostic indicators of bioavailable stressors in aquatic ecosystems – a critical component in the EPA's exposure characterization as part of its ecological risk assessment mission



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