

## **Is It Really Doses And Responses Instead Of Dose Response?**

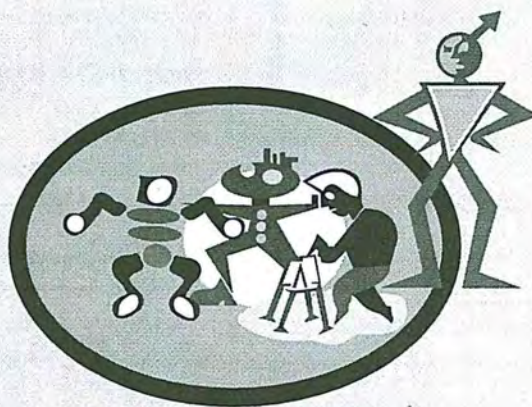
Barbara A. MacKenzie, Raymond E. Biagini, Deborah L. Sammons, Jerome P. Smith, John E. Snawder and Cynthia A.F. Striley, National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, Cincinnati, OH

A major limitation in biological monitoring for human exposures to xenobiotics and the evaluation of their effects from these exposures is that the body burdens are looked upon as multiple independent variables. In fact, the multivariate effects of exposures to numerous xenobiotics and their effects on multiple systems are a truer picture of the outcome of occupational or environmental exposures. The pre-existing view of exposure-effect relationships is brought about by practical limitations of the experimental method, where measurements of body burdens and effects of even a few xenobiotics by classical methods is resource taxing. Furthermore, conclusions regarding exposure-effect relationships when a limited number of body-burdens and effects are investigated are wrought with numerous potential errors which may be propagated during risk analyses. In the present work, we describe and review a technology that overcomes some of these limitations by multiplexing (measuring numerous analytes simultaneously), using fluorescence microsphere covalent immunoassays (FM CIA). Examples of the utility of this method for multiplexed measurements of biomarkers of exposure and effect (as many as 25 analytes simultaneously) from exposure to pesticides, multivalent vaccinations, and anthrax are presented and reviewed.



# *Applying Biomarkers to Occupational Health Practice*

**Exposure Assessment Methods Workshops**



## *Abstract*

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