

Monitoring of Selected Herbicides, Antibiotics, Steroids, and Industrial Chemicals in Water by ELISA

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Biographical Sketches of Authors

Fernando Rubio is a biochemical scientist and president of Abraxis, LCC. Fernando has developed immunoassays for analytes of clinical and environmental significance since 1976. His current interests are the development of immunochemical products to serve the agricultural, environmental, food safety and clinical markets.

Kristy Ramsey has served as a researcher in the department of research and development, Abraxis LLC. Since 2000, she has developed ELISA kits for monitoring environmental pollutants such as pesticides, endocrine disruptors, industrial chemicals and algal toxins.

Paul Stackelberg has worked as a hydrologist with the Water Resources Discipline of the USGS since 1988. Paul participates on the National Water Quality Assessment (NAWQA) Program, assessing the occurrence of pesticides in ground-water samples from across the Nation and identifying those natural and anthropogenic factors most clearly associated with pesticide occurrence. Recently Paul has been working in cooperation with the NJDEP and the Centers for Disease Control to assess the occurrence of contaminants of emerging concern in New Jersey's water resources. Specifically, Paul has focused on the occurrence of pharmaceuticals and other wastewater-related compounds in the State's streams and their persistence and fate through conventional and advanced drinking-water-treatment facilities.

Dr. Meyer has served as a research assistant and research scientist with the U.S. Geological Survey (USGS) since 1988. Mike was the Chief Research Scientist of the USGS, Florida District, Water Quality and Research Laboratory from 2000 to 2003 and is currently the director of the USGS, Kansas District Organic Geochemistry Research Group. The focus of his research is development of analytical methods to study the nature of organic contaminants in surface water and ground water. His primary interest is the study of "emerging contaminants" such as pesticide degradates and pharmaceutical compounds. Dr. Meyer has initiated and participated in several field, watershed, regional, and national scale studies of selected "emerging organic contaminants" in surface and ground water.

Abstract

Concerns due to the potential health effects on human health and wildlife resulting from the production, use, and disposal of numerous chemicals used in agriculture, pharmaceuticals, industry, and household conveniences, have increased over the years. Many of these compounds find their way into rivers and streams from agriculture run offs, raw sewage waste overflows, incomplete waste treatment, other point discharges and diffuse sources. Very sensitive methods are required to analyze for these contaminants in water samples because in many instances, they are present at very low concentrations (ng/mL). Enzyme linked immunosorbent assay (ELISA) technology was used to analyze water samples collected during the summer of 2003 at various locations of water treatment plants (WTP) in New Jersey, and from stream providing raw water to those plants. Each sample was analyzed for selected herbicides, antibiotics, steroids, and industrial chemicals. Details of the technology, testing procedures, and results obtained will be presented.