

Biomonitoring

Background



Biomonitoring is the measurement of chemicals present in tissues or body fluids, such as blood and urine. Measuring chemicals in blood or urine provides a lens through which to identify chemicals that are both made by our body and those that come from our diet or the environment.

Modern analytical techniques allow researchers to detect and measure minute levels of an increasing number of substances in body fluids. Should this technology advance far enough, it will become possible to find some level in blood or urine of virtually every chemical on earth, of which there are millions.

In its 2006 report, *Human Biomonitoring for Environmental Chemicals*, the U.S. National Academy of Sciences (NAS) cites the successful use of biomonitoring data to identify and reduce exposure to lead, mercury and second-hand cigarette smoke. The NAS concluded, “biomonitoring is a powerful new lens for examining public exposures to toxic chemicals.”

Alone, biomonitoring data are not very informative in helping the public understand individual health risk. This point is underscored by the Centers for Disease Control (CDC) which states: *“Just because people have an environmental chemical in their blood or urine does not mean that the chemical causes disease. The toxicity of a chemical is related to its dose or concentration. Small amounts may be of no health consequence, whereas larger amounts may cause disease.”*

A major challenge facing biomonitoring programs is how to interpret the data and how to best communicate the meaning of the information to the public. Biomonitoring of cholesterol for example, required years of research and millions of dollars to establish acceptable risk-based values to protect against heart disease.

There is a lack of adequate information to determine health risks associated with minute levels of chemicals detected in biomonitoring samples.

To address the need for interpretation, industry and government scientists and regulators are working together to validate a methodology that can be used to bridge conventional risk assessment with data generated in biomonitoring studies.

Pharmacokinetic models are used to convert regulatory exposure guidelines such as reference doses (RfDs) into equivalent quantitative values specific for blood or urine. These values are termed “biomonitoring equivalents,” or BEs.

Information gathered from biomonitoring can be severely misconstrued and subsequently misused. Assertions that any level of a synthetic chemical in the body is harmful are scare tactics with no factual basis. In recent news, biomonitoring data were collected from a handful of politicians or celebrities to gain public attention. This is sensationalism that lacks ethical oversight and is scientifically meaningless.

Position

Scientifically and statistically sound biomonitoring data can provide regulatory and public health officials with information on actual chemical exposure, which can improve interpretation of epidemiology studies. The caution is that the mere presence of a substance may be misinterpreted and could create unwarranted alarm.

Pesticides potentially detected in biomonitoring programs are among the most extensively studied and regulated chemicals on earth, and any use keeps human health and environmental safety top of mind.

California recently passed a biomonitoring bill. The Centers for Disease Control already has a comprehensive scientifically sound biomonitoring program in place. Multiple state programs could lead to duplication, inconsistency and misinterpretation of data.

REPRESENTING THE PLANT SCIENCE INDUSTRY