EPA's new pesticide testing is outdated, crude

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In its search for endocrine-disrupting chemicals, the EPA should turn to scientists who think outside the box and inside the womb. The agency's testing program is "a pitiful skeleton" that will fail to detect many serious effects on human development.

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The Environmental Protection Agency is ready to start testing 67 pesticide ingredients for their possible endocrine disruption effects. But the testing program the agency plans to use is only a pitiful skeleton of what it needs to be. This battery of tests, first recommended in 1998, is outdated, insensitive, crude, and narrowly limited.

Each test and assay was designed under the surveillance of corporate lawyers who had bottom lines to protect and assorted toxicologists who were not trained in endocrinology and developmental biology. For over a decade, EPA has ignored the vast wealth of information on endocrine disruption from independent academic researchers funded by the United States and other governments in Europe and Asia. This 21st century research is based on different assumptions than the toxicological assumptions that drove the EPA test designs. And most important, because of the limited scope of its test battery, EPA is not in a position to address the pandemics of endocrine-related disorders that pose a threat to every child born today.

The big question, of course, is how could this have happened? Well, from the very beginning, institutional barriers, bureaucratic inertia, and corporate interference led to one disconnection after another.

Starting in 1996, when Congress passed the new Food Quality Protection Action with the Federal Food, Drug, and Cosmetic Act Amendments, it told EPA to develop a screening program using tests and other scientifically relevant information to determine whether substances have hormonal activity. In response, EPA set up the Endocrine Disruptor Screening Program, including a committee with members representing the industries to be regulated, toxicologists, and a few token representatives from non-profit organizations. The scientists who discovered endocrine disruption and the hundreds of others, most of whom were not toxicologists and had shifted their research focus to the connections between a mother and her embryo and fetus, were not invited to participate. Instead of listening to those who knew something about endocrine disruption, EPA tried to use traditional toxicology protocols, forgetting that these had failed miserably and allowed endocrine disruptors to get through the government's programs to protect public health. EPA ignored the growing knowledge about endocrine disruption and trade associations

representing corporations with deep pockets denied it. Consequently, EPA struggled along under the false assumptions that 'the dose makes the poison' and that high dose testing is sufficient to detect any chemical that can interfere with endocrine control of development and function.

Since the early 1990s, independent scientists in academic laboratories around the world have published hundreds of articles demonstrating how a broad selection of chemicals can interfere with the normal development of a baby at extremely low levels of exposure – in fact, levels similar to those experienced every day by people worldwide. These studies were done with the knowledge that the embryo and fetus develop under the control of hormones at parts per billion and parts trillion, and that as the baby matures hormone concentrations are regulated by sensitive, thermostat-like, feedback control systems in the brain. These pioneering scientists discovered effects for some widely used chemicals at concentrations thousands of times less than government "safe" levels of exposure derived through traditional toxicological tests. But their publications announcing damage in other components of the endocrine system, such as the pancreas, adrenal glands, bone, and mammary tissue, got no farther than headlines in newspapers. They had no effect on policy. While this wealth of knowledge was piling up, EPA, held back by institutional inertia, continued to attempt to validate a handful of single-focus assays to detect only a very small component of endocrine disruption. There was no connection between the assumptions of the toxicologists and those of the endocrinologists, developmental biologists, and the multi-disciplinarians doing the research needed to detect endocrine disruptors. This same disconnection was being played out in Europe where governments also continued to use outdated toxicological dogma.

One of the chemicals on EPA's list, atrazine, is a herbicide reported in aquatic and drinking water systems across the USA. It will likely pass this battery of tests with flying colors even though it feminizes laboratory animals and frogs by turning on the enzyme that converts testosterone to estrogen. EPA is proposing an assay to detect chemicals that can block that enzyme, but it cannot detect chemicals that turn it on.

EPA's testing program is full of voids, addressing only a segment of the organs, tissues, and systems that make up the endocrine system. It will not detect chemicals that can alter development and function of the pancreas, and its hormone, insulin, which could lead to diabetes and obesity. It also will not detect chemicals that alter how the brain is constructed and programmed that can undermine intelligence and behavior. An insecticide--like chlorpyrifos, which alters how brains develop and leads to measurable changes in behavior and function later in life--will probably not be picked up by the proposed tests.

In light of the increasing pandemics and the new administration's willingness to seek and make 180 degree changes, the time is ripe to move forward and let the scientists who understand the complexity of the endocrine system step in. Give these scientists, who have proven that they can think outside the box and inside the womb, the opportunity and wherewithal to design a couple of comprehensive, multi-organ

assays to detect the most sensitive alterations in embryonic and fetal development and function. These assays that will ultimately reduce the use of thousands of animals and make up for the time lost over the past decade. Thanks to the internet, a rich set of data about endocrine disruption research is available, and with teleconferencing, scientists no longer have to leave their labs and travel long distances to communicate in large group sessions. These scientists are on the verge of developing protocols that will look nothing like what was done in the past to address a serious global health problem.

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