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**In support of: SB345 - Pesticides - PFAS Chemicals - Prohibition**  
**Before the Senate Education, Energy & Environment Committee**

Dear Chair Pena-Melnyk and members of the committee:

I am a toxicologist and microbiologist by training and as the former director of the [National Institute for Environmental Health Sciences \(NIEHS\)](#), as well as the [National Toxicology Program \(NTP\)](#), positions I held from January 2009 until October 2019, I have been one of the scientists sounding the alarm on PFAS—known as the “forever chemicals”—and have been engaged in efforts with other scientists and public health experts to address the serious health concerns related to PFAS. I also worked for the EPA for 19 years prior to my work at NIEHS and NTP, directing the largest division focused on environmental health research. My research has focused on the health impacts of environmental chemicals. I have been granted NIH scientist emeritus status and am a Scholar in Residence at the Nicholas School of the Environment of Duke University.

The widely accepted Organization for Economic Cooperation and Development (OECD) **definition of PFAS is considered *the* scientific definition, accepted by 37 nations including the US.** It is very similar to how **PFAS is defined in 22 states, the Dept. of Defense, and Congress, which all align with Maryland’s definition.** You may hear accounts that EPA’s Office of Pesticide Program has its own ‘working’ definition, not used by other EPA departments, that would reduce the 15,000+ PFAS to 6,000. This does not mean that more than half of the PFAS are no longer classified as PFAS. EPA allows its programs to define PFAS relative to distinct scopes of work within EPA. EPA’s [CompTox Chemicals Dashboard](#), a key tool in EPA’s PFAS Analytic Tools clearly identifies over 15,000 chemicals as PFAS, including these 66 pesticide active ingredients.

Many of the 15,000+ PFAS are not intended products but are produced while making the products or during the lifecycle of products. **PFAS break down into other PFAS products which are often more toxic and persistent than the original PFAS that were intentionally produced.**

The contaminants known as PFAS cause multiple health problems... I definitively say “cause” instead of “are linked”. While thousands of scholarly articles have linked the chemicals to a plethora of health effects, I believe we can currently say there is sufficient weight of evidence for causation of adverse impacts, as opposed to linkage, to our health.

While I was leading the NIEHS, one of the Institutes of the National Institutes of Health, whose mission is to discover how the environment affects people in order to promote healthier lives, I was not allowed to use the word “cause” when referring to the health effects from PFAS or other chemicals. If I was talking about human data or impacts on people, I had to always say there was an association with a laundry list of effects. This was because there are no double-blind, placebo controlled clinical trials for PFAS. It would be unethical to intentionally expose people to chemicals of great concern.

The term Association, the coincidence of a chemical exposure and disease, and causation, in which a health problem happens *as the result* of the exposure, are different. Because many factors, including chance and genetics and exposures to other substances can influence the development of disease, the term “cause” is used cautiously in the field of environmental health.

But I have studied PFAS compounds for decades and believe the global contaminants have cleared that high bar. In my mind, PFAS cause health effects because you have the same kind of effects reported in multiple studies in multiple populations. You have longitudinal studies showing the same effects in multiple populations done by multiple investigators and you have animal models showing the same impact. And there is temporality – exposure occurs before you can see the effect.

That is good evidence that PFAS or certain PFAS can cause health effects in people. It is not as strong for every effect, but there are many effects where the evidence is strong enough to say “caused,” in particular, to the relationship between these chemicals and immune system effects, kidney cancer, and elevated cholesterol in humans—the data is very clear.

And amidst continuing COVID-19 concerns, it’s important to note that PFAS reduces our antibody response to vaccines and that elevated PFAS levels are associated with COVID-19 susceptibility and with an increased risk of a more severe course of COVID-19. In 2021, a study observed higher mortality associated with COVID-19 for a population with heavy exposure to PFAS, which the study authors attributed to immunosuppression, bioaccumulation in the lungs, or pre-existing disease related to PFAS exposure. More recently, in 2024, another study conducted an analysis of PFAS contamination in community water systems and COVID-19 mortality rates, with the national-level analysis showing a 13% higher COVID-19 mortality rate with the presence of at least one PFAS above reporting limits. Another 2024 study investigated the antibody response to the COVID-19 vaccine and found a diminished increase in antibody response after receiving the booster for those with higher PFAS serum levels, indicating a potential immunotoxic effect.

A striking feature of PFAS is how they can cause harm to so many systems within our bodies—our livers, our kidneys, our immunity, our metabolism. Other health issues caused by PFAS include elevated cholesterol levels, liver dysfunction, weight gain, reproductive problems, and kidney cancer, which have been shown to increase along with the levels of the chemicals in blood.

PFAS also increases asthma in children, during pregnancy can impact the health of the mother and her child, can cause poor executive functioning, ulcerative colitis, high cholesterol, thyroid disruption, prostate and ovarian cancer, lower birth weight and size, delayed puberty, early menopause and more.

### **Concerns about PFAS have existed since the 1960's**

PFAS has been of great concern to me and many other scientists around the globe for decades. PFAS-exposure related health concerns began in the 1960s starting with DuPont raising concerns regarding health risks of PFAS in an internal 1962 document—fast forward to 1978 when an unpublished study shows adverse effects of PFOA in monkeys, then in 1980 PFAS was detected in serum of workers, in 1981 concerns arose about birth defects in children born to women workers, in 1987 PFOA was shown to cause cancer in a rat study, and later on in 1998, samples from U.S. blood donors in the general population were shown to contain PFAS. In fact, 3M knew this from 1975!

In 2000, PFOA and PFOS were detected in nearly 100% of Americans and 3M announced plans to phase-out PFOA and PFOS. In 2004, DuPont settled a class action suit (>80,000 plaintiffs) for \$343 million. In 2006, EPA invited 8 major company producers to phase out PFOA by 2015. In 2012, immune system suppression related to PFAS was reported in children. This finding has been repeated multiple times in different populations.

EPA released a statement December 20, 2021 announcing a nationwide monitoring effort for 29 per- and polyfluoroalkyl substances (PFAS) in drinking water. The Fifth Unregulated Contaminant Monitoring Rule (UCMR5) will provide data on the frequency and magnitude at which these chemicals are found in the nation's drinking water systems and will improve EPA's ability to conduct state and regional assessments of contamination. EPA promulgated Maximum Contaminant Level, or MCLs, for PFOA, PFOS, PFNA, PFHxS, and GenX, and used a mixtures approach and the Hazard Index for PFNA, PFHxS, GenX, and PFBS on April 26, 2024. The MCLs for PFOA and PFOS are 4 ppt (ng/L), an infinitesimally small amount. In the past year, numerous Maryland schools have been found to have unsafe levels of PFAS in their drinking water.

We are exposed to PFAS most often through ingestion, however the [ultra-short chain PFAS targeted in this bill have been found to be readily absorbed through skin](#), making PFAS pesticides a particularly dangerous occupational hazard for farmers and farm workers exposed to PFAS pesticides used in the fields, in the air, and when produce is handled.

As you will also hear from other experts, the current total number of PFAS is more than 15,000 chemicals—that includes PFOS, PFOA, PFHxS, PFMOAA, GenX, ADONA, Nafion Byproduct 2, TFA, etc.—these compounds are environmentally persistent, mobile, and bio-accumulative. Some of these PFAS pesticides cannot be removed from our drinking water or our soil with any currently available remediation technology.

We need to turn off the tap on this avoidable source of PFAS from pesticides. There are scores, if not hundreds of effective alternative pesticides among the 14,000 pesticides registered in Maryland, that do not contain PFAS forever chemicals. Therefore, it behooves the state to at least ban these 66 known PFAS active ingredient pesticides to protect Marylanders and the precious resources of our soil and water.

Turning off the tap of known PFAS-containing pesticides, is a critical step forward, given how frequently Maryland residents and communities are exposed daily to PFAS-contaminated food and water, and to mosquito control products, lawn care, and agricultural pesticides throughout the year. To help protect future generations, we need comprehensive state policies to end unnecessary uses of PFAS prior to EPA setting federal policies. Under the new federal administration, we cannot rely on EPA to adequately address needed PFAS protections. States like Maryland need to protect their residents from this source of needless and often repeated PFAS exposure.

I urge this committee to take a crucial simple step in protecting Marylanders by passing SB345.