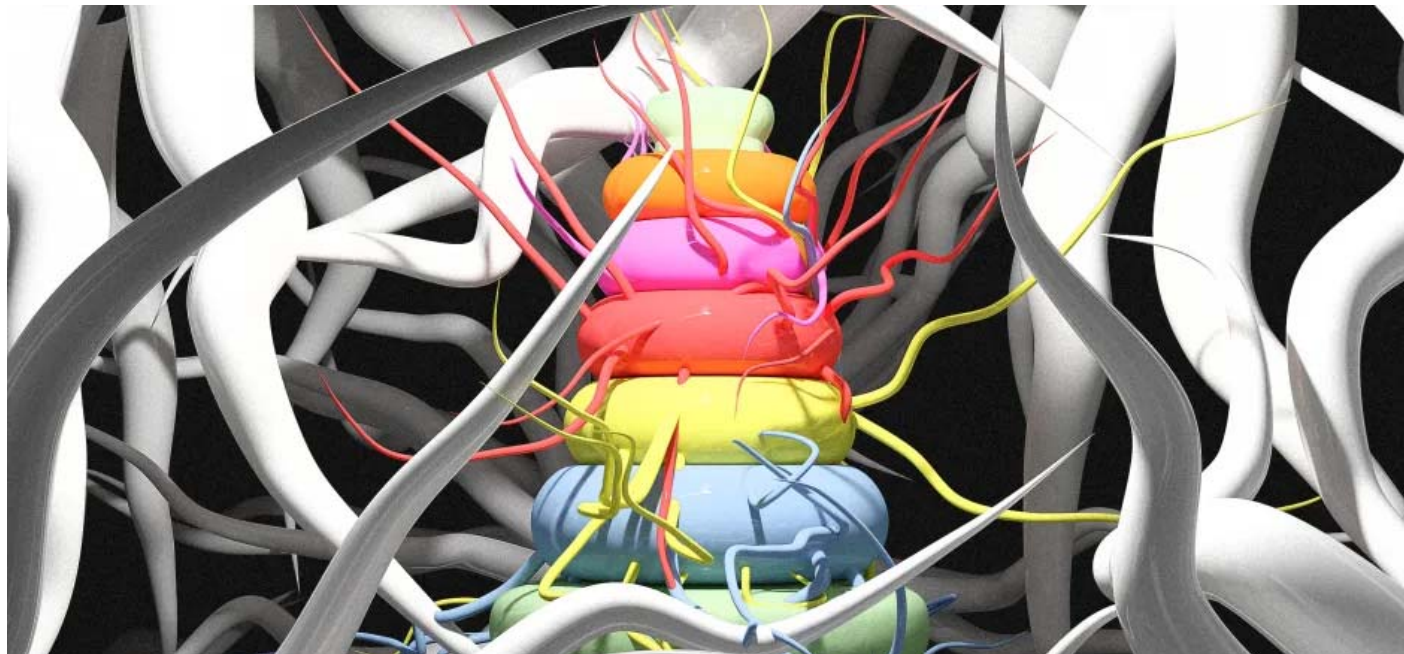


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# There are thousands more toxic chemicals in plastic than we thought

You know that phthalates and flame retardants are toxic. But a new study finds that a quarter of all chemicals in plastics could be equally harmful to you.



BY ELIZABETH SEGRAN

5 MINUTE READ

You may already be trying to cut down on your plastic usage because the material doesn't biodegrade and it can pollute the planet for hundreds of years. But there's another reason you might want to stay away.

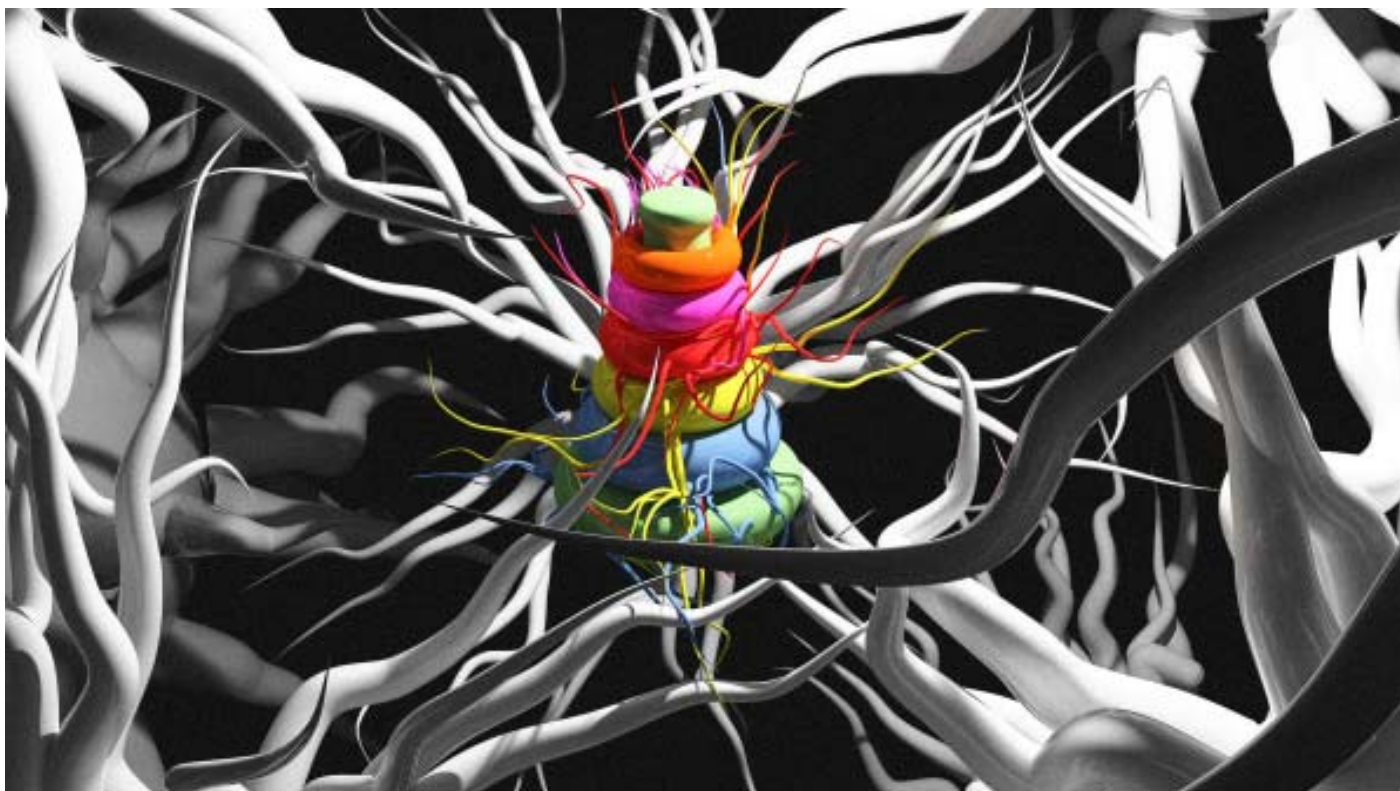
A **new study** finds that plastics release many more toxic chemicals throughout their life cycle than previously thought, posing significant risks to both people and the planet. Until now, only a small number of these chemicals have been properly studied. But the new paper published in the journal *Environmental Science & Technology* provides the most comprehensive database of chemicals in plastic, and offers a terrifying look into just how harmful the material may be.

The team of researchers, led by Stefanie Hellweg, a professor of ecological systems design at the Swiss university ETH Zurich, identified a whopping 10,500 chemicals in the plastics they studied. The team spent two and a half years studying a wide variety of plastic products, using scientific, regulatory, and industry databases to identify all the chemicals contained within them. They then cross-referenced these chemicals with scientific databases that identified whether the chemicals were hazardous, benign, or not adequately studied.

Of these chemicals, about a quarter—2,480—were “substances of potential concern,” which means there is some evidence to indicate they are harmful. In some cases, the chemicals are known to be toxic to aquatic life, cancer-causing, or damaging to specific organs. In others, the chemicals can accumulate in humans and animals, causing problems such as memory loss over time.

Helene Wiesinger, lead author of the study and a doctoral student at ETH Zurich, says that at least 1,000 of the chemicals identified as substances of concern can be harmful even in small doses. “If something is a carcinogen, it is agreed upon in the scientific community that there is no safe level of exposure,” she tells *Fast Company*. “Even at very low levels, these can lead to cancer, and obviously [it] gets worse with high doses. With endocrine disruptors, small doses can be problematic. With these chemicals, using any at all is a problem.”

The researchers could not properly categorize a further 39%—4,100—of the chemicals, because there is no clear evidence about whether or not they are hazardous. There are many ingredients in plastic that scientists agree are not harmful, but this study reveals that there are many chemicals that have just not been adequately studied. “Our research was designed to nudge the scientific community to devote more resources to studying these chemicals,” Wiesinger says. “So far, scientists have focused on a limited number of dangerous chemicals in plastic, but there’s a lot we don’t know.”



[Source Image: twin97/Blendswap]

Plastics are all around us. More than 350 million metric tonnes are produced worldwide every year, adding to the billions of metric tonnes that are clogging up our landfills and oceans. The harmful chemicals the researchers identified were found in many plastic objects we use everyday, including toys, medical devices, masks, food packaging, and textiles.

They also eventually invade our ecosystems, where they can harm both people and animals. Some plastics end up in the ocean, where sea animals mistake them for food, and eventually become part of the human food chain. Chemicals can also be released in recycling processes, which means they can make recycled plastic unsafe.

So why are plastics so jam-packed with chemicals? Plastic is a cheap substance that can be transformed into almost any material you can imagine, from silk-like synthetic fabrics to sturdy furniture. To create these different materials, factories use additives to give the plastic its desired properties, such as antioxidants to prevent degradation, flame retardants, and plasticizers to reduce brittleness. During production, catalysts, solvents, and other chemicals are used to help process the material.

Researchers have known that some of these chemicals are dangerous. A study by the U.S. Consumer Product Safety Commission about [phthalates](#) (which make materials more flexible) found that they cause asthma, breast cancer, type 2 diabetes, disruption to reproductive health, and a slew of other health problems. The Environmental Protection Agency also determined that [brominated flame retardants](#) found on furniture, in house dust, and in indoor air have been linked to hormone disruption and development problems in children. But this latest study identified other chemicals in plastics that researchers aren't paying enough attention to. A propanol commonly used as a solvent in colorants is known to cause damage to the reproductive system. A benzene used in controlling polymerization is known to cause skin sensitivity and harm aquatic life.

Even regulators aren't keeping track of these chemicals. A full 53% of chemicals the researchers identified as potentially concerning are not regulated in the United States, the European Union, or Japan. In fact, 901 chemicals known to be hazardous are actually approved for use in contact with food in these regions.

A big part of the problem, the researchers say, is that there isn't a central database that offers information about all of these different chemicals and their potential risks. Indeed, the researchers spent two and a half years combing through 190 publicly available data sources to figure out what constituted a substance of potential concern. There is also a lack of transparency in the plastics industry about the chemicals that go into their products. In the study, the researchers call on regulators to compel plastics manufacturers to disclose all the ingredients in their products.

What's a consumer to do? We can opt for organic materials whenever possible, but it is virtually impossible to eradicate plastic from our lives completely. The modern world is saturated with plastic, from the coatings on our wood furniture to the garments that fill our closets to the paints that cover our walls. To Wiesinger, the onus is on companies to better track and eliminate these chemicals.

"It's an overwhelming burden to ask consumers to be responsible for keeping the environment they live in safe by choosing the right kinds of plastics," Wiesinger says. "This is a problem that needs to be tackled by the industry and regulators, rather than by the consumers themselves. But what every citizen can do is demand more transparency from companies that produce plastic."

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#### ABOUT THE AUTHOR

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