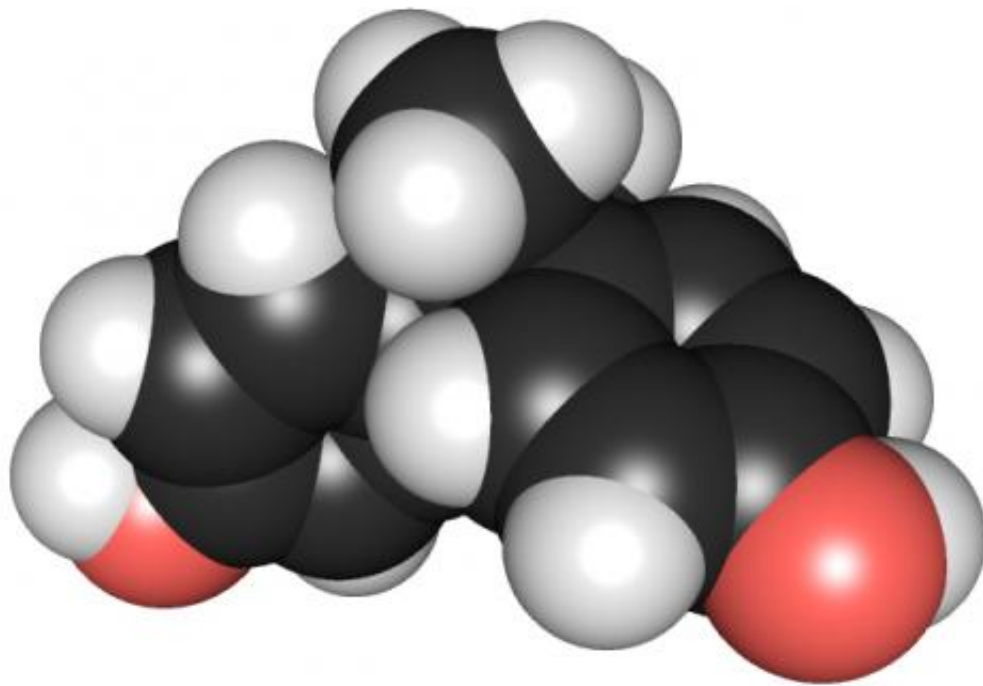


Exposure to Bisphenol A 'hard to avoid' in everyday life

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3D chemical structure of bisphenol A. Credit: Edgar181 via Wikimedia Commons

86 per cent of teenagers have traces of Bisphenol A (BPA), a chemical compound used to make plastics, in their body, an Engaged Research public engagement project in collaboration with the University of Exeter has found.

Measurable levels of BPA, an endocrine-disrupting chemical, were found in the urine of the vast majority of the 94 17-19 year olds tested, according to research at the University of Exeter led by Professor Lorna Harries, Associate Professor in Molecular Genetics, and Professor Tamara Galloway, Professor of Ecotoxicology.

They called for better labelling of packaging to enable consumers to choose BPA-free products.

The citizen-science project was carried out in a real-world setting to provide young people with first-hand experience of all aspects of scientific research.

Students designed, took part in and published the research study into whether changes in their lifestyle and diet could have an impact on BPA in their bodies.

They found that chemical is so ubiquitous that trying to reduce exposure by avoiding [food](#) packaging and food likely to contain BPA has no measurable impact on exposure, according to research published in the *BMJ Open* journal.

The research, An engaged research study to assess the effect of a 'real-world' dietary intervention on urinary bisphenol A (BPA) levels in teenagers is the largest self-administered intervention study of exposure to BPA in unrelated individuals. Teenagers are thought to be one of the population demographics with the highest levels of exposure.

BPA passes relatively swiftly out of the body with a short half-life of around 6 hours, but measurable BPA was detected in 86% of the participating students, with an average level of 1.9ng/ml. This is similar to population exposure levels in other countries around the world, and reflects the exposure to BPA in the environment.

The study concluded:

"We found no evidence in this self-administered intervention study that it was possible to moderate BPA exposure by diet in a real-world setting. Our study participants indicated that they would be unlikely to sustain such as diet long term, due to the difficulty in identifying BPA free foods."

BPA is an industrial chemical which has been used since the 1960s to make certain types of plastic. The chemical can be found in plastic containers and water bottles, till receipts, on the inside of cans and bottle tops and in plastic packaging and tubing. DVDs, CDs and sunglasses can also contain BPA though this is not a major route for exposure through skin.

BPA, a chemical with similarities to oestrogen, can get into the body through our diet. Highly-processed foods, or foods packaged in some plastics, can contain high levels of BPA. It is capable of causing changes to the expression of oestrogen-responsive genes, and the regulation of hormones, previous research by the Exeter team has found.

Endocrine disruptors are chemicals that may interfere with the body's endocrine system. A wide range of substances, both natural and man-made, are thought to cause endocrine disruption. The EU Member State Committee (MSC) has said that Bisphenol A is an endocrine disruptor.

Leaching of BPA from products can increase with higher temperatures and with time and use, for example through repeated use of plastic water bottles if they contain BPA.

The Exeter academics said consistent labelling of packaging would enable consumers to identify products containing BPA.

Professor Galloway said: "We found that a diet designed to reduce exposure to BPA, including avoiding fruit and vegetables packaged in plastic containers, tinned food, and meals designed to be reheated in a microwave in packaging containing BPA, had little impact on BPA levels in the body".

"Our students who followed the BPA-free diet reported that it would be difficult to follow it long term, because labelling of BPA products was inconsistent. They found it difficult to source and identify BPA-free foods."

Professor Harries, Associate Professor of Molecular Genetics at the University of Exeter, said: "Our study shows that currently we do not have much of a choice about being exposed to BPA. We believe that much better labelling of products containing BPA is needed so people can make an informed choice".

The teenagers' urine was tested before they took part in the trial and afterwards to see if the diet made a measurable difference to levels of BPA in the urine.

Overall, teenagers who spent a week following guidelines designed to reduce BPA exposure in their diet did not see a drop in exposure. However, some of those with the highest levels of BPA in their urine did show some reduction.

The students from schools in Devon followed strict guidelines that they had designed as part of the research team for a week which included avoiding plastic packaging which contains BPA, switching to stainless steel and glass food and drink storage containers, and avoiding tinned food. They were also asked to switch to ceramic or glass food containers before microwaving.

Professor Galloway said:

"Exposure to the endocrine-disrupting chemical Bisphenol A is ubiquitous. There is growing evidence that exposure to endocrine-disrupting chemicals may be associated with adverse health outcomes. Measurable levels of BPA were present in the vast majority of our participants. They were unable to achieve a reduction in their urinary BPA levels over the 7-day trial period despite good compliance to supplied guidelines."

Students who followed the BPA-free diet reported that it would be difficult to follow it long term, because labelling of BPA products was inconsistent and the difficulty of sourcing and identifying BPA-free foods.

Professor Harries, Associate Professor in Molecular Genetics at the University of Exeter, added: "BPA is a pervasive endocrine-disrupting chemical widely present in our food chain and our environment. Most people are exposed to BPA on a daily basis. In this study, our student researchers have discovered that at the present time, given current labelling laws, it is difficult to avoid [exposure](#) by altering our diet. In an ideal world, we would have a choice over what we put into our bodies. At the present time, since it is difficult to identify which foods and packaging contain BPA, it is not possible to make that choice.

"This study shows that it is possible to involve school students in real research. We wanted to give the students an authentic experience of what being a researcher is really like."

More information: *BMJ Open* (2018). [DOI: 10.1136/bmjopen-2017-018742](https://doi.org/10.1136/bmjopen-2017-018742)

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