Website address:
https://www.gesundheitsindustrie-bw.de/en/article/press-release/plasticizers-can-cause-asthma-and-allergies

Plasticizers can cause asthma and allergies

Plastic products can be found everywhere in daily life, soft plastic in particular often being used for packaging or children's toys. These often contain so-called plasticizers which ensure that the material remains flexible. Because plasticizers are not bonded permanently to the plastic, they can escape from the material, meaning they can be absorbed by humans.

One example of this is the plasticizer DEHP, which has long been associated with the development of asthma. Until now, what was known is that the plasticizer increases allergic reaction in the lungs. Researchers at Furtwangen University have now found that DEHP also affects the blood formation of stem cells in the bone marrow, in what are known as hematopoietic stem cells. "Our colleague Professor Dr Folker Wenzel found the first indications of this back in 2015," notes Chief Investigator Professor Dr Hans-Peter Deigner. "However, the effect differed depending on the type of blood cell formed, and we wanted to find out what caused this."

Doctoral student Lars Kaiser has found that the plasticizer disrupts blood formation through oxidative stress. "However, the sensitivity of the cell to this stress depends largely on the corresponding metabolism," explains Lars Kaiser. "Cells that predominantly break down fats are significantly less sensitive here than those that predominantly metabolize sugar." As a result, certain blood cells die even at low concentrations of the plasticizer, while others do not. "Although the experiments have been carried out in the petri dish, a comparable correlation in humans has already been found in an American study from the 1990s," emphasizes Chief Investigator Deigner. Lars Kaiser also found that the connection between metabolism and the sensitivity of cells to oxidative stress is not limited to bone marrow but is also present in other parts of the body.

The EU has already put substantial restrictions on the use of the DEHP plasticizer, but it can still be found in medical products or older floor coverings. The research group was also able to show that it is irrelevant which substance forms the oxidative stress. Other substances showed the same effects on blood formation. "The substitutes for DEHP currently in use are scarcely better," Lars Kaiser notes. "It has already been shown that many of these substitutes also lead to the formation of oxidative stress and thus most likely have similar effects on blood formation."

Press release

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Further information

- Furtwangen University

Publication:

Kaiser, L. et al. Lineage-Selective Disturbance of Early Human Hematopoietic Progenitor Cell Differentiation by the Commonly Used Plasticizer Di-2-ethylhexyl Phthalate via Reactive Oxygen Species: Fatty Acid Oxidation Makes the Difference. Cells 10, 2703 (2021). https://doi.org/10.3390/cells10102703