Chemical cocktail affects humans and the environment

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Throughout our lives we are exposed to an enormous range of man-made chemicals, from food, water, medicines, cosmetics, clothes, shoes and the air we breathe. At the request of the EU, researchers at the University of Gothenburg, Sweden, have looked at the risk of "chemical cocktails" and have proposed a number of measures that need to be implemented in the current practice of chemical risk assessment.

In 2005 an American study showed that newborn babies have an average of 200 non-natural chemicals in their blood - including pesticides, dioxins, industrial chemicals and flame retardants. In a Swedish study, the Swedish University of Agricultural Sciences found 57 different pesticides in Swedish rivers and streams, many of them occurring simultaneously. However, the effects of chemicals on humans and the environment are traditionally evaluated on the basis of single substances, chemical by chemical.

Complex cocktail

Research has shown that this type of approach is inadequate as the chemicals that we use form a complex cocktail. The EU's environment ministers have therefore urged the European Commission to step up its risk assessments and amend the legislation on the combination effects of chemicals. In concrete terms, the Commission has been tasked with producing recommendations in 2010 on how combinations of hormone-disrupting substances should be dealt with on the basis of existing

legislation, and with assessing suitable legislative changes in 2011.

Unambiguous research results

In order to map out the current situation, researchers from the University of Gothenburg and the University of London carried out a review of the state of the art of mixture toxicology and ecotoxicology. The study showed that all the relevant research is unambiguous: the combined "cocktail effect" of environmental chemicals is greater and more toxic than the effect of the chemicals individually.

Guidelines needed

"The number of chemical combinations that the Earth's living organisms are exposed to is enormous," says Thomas Backhaus, researcher at the Department of Plant and Environmental Sciences and co-author of the report. "Assessing every conceivable combination is not therefore realistic, and predictive approaches must be implemented in risk assessment. We need guidelines on how to manage the chemical cocktail effect so that we can assess the risks to both humans and the environment."

More information: The study, State of the Art Report on Mixture Toxicity, is published by the EU's Directorate-General for the Environment. Download the report at: ec.europa.eu/environment/chemicals/effects.htm

Provided by University of Gothenburg