

Exposure of humans to cosmetic UV filters is widespread

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An investigation conducted in the context of the Swiss National Research Programme (NRP50), Endocrine Disrupters: Relevance to Humans, Animals and Ecosystems, demonstrates for the first time that internal exposure of humans to cosmetic UV filters is widespread.

In the course of the Summer and Fall 2004, 2005 and 2006 (3 cohorts), human milk was sampled by mothers who had given birth at the University Women's Hospital in Basel. The participants filled out a detailed questionnaire with general questions and, as special feature, in depth questions on use of different types of cosmetic products.

Chemicals out of a large range of products including "modern" chemicals and classical persistent organic pollutants (POPs) were analyzed in the same human milk sample by analytical laboratories in Freiburg, Erlangen and Baden. The list comprised cosmetic UV filters, synthetic musk fragrances, pesticides, phthalates, parabens, <u>flame</u> <u>retardants</u> (polybrominated diphenylethers), and polychlorinated biphenyls (PCBs); in total 89 analyses per milk sample. The chemical analytical data of milk samples of individual mothers were then compared with the information obtained through the questionnaire.

The investigation revealed that one and the same human milk sample contained a large range of <u>chemical contaminants</u>, most of which are known to interact with endocrine systems. Individual exposure patterns differed between different types of chemicals. The study demonstrates for the first time that internal exposure of humans to cosmetic UV filters



is widespread. Cosmetic UV filters were present in 85% of human milk samples, at concentrations comparable to PCBs. Synthetic musk fragrances were also present in the milk samples. The presence of UV filters in human milk was significantly correlated with the use of cosmetic products containing these UV filters. As a result, exposure patterns differed between individuals.

It seems plausible that exposure to other cosmetic constituents such as synthetic fragrances is also linked to the use of the corresponding products. However, this could not be investigated because musk fragrances are not declared. In contrast, classical contaminants such as PCBs, DDT and metabolites of DDT as well as some other persistent organochlor pesticides represented a rather uniform background exposure. Their levels were in part correlated with each other and also with fat-rich nutrition.

A total daily intake of each individual chemical was calculated for each individual infant from their individual levels in human milk. Calculation included fat content of individual milk samples, total daily milk intake per infant and body weight of the infant. Some infants exhibited values of daily intake of PCBs and several organochlor pesticides that were above US EPA reference dose values.

Margret Schlumpf and Walter Lichtensteiger, who lead the research said, "Research on the effects of endocrine disrupters (chemicals interfering with hormone actions) has shown that it is of utmost importance to obtain information on simultaneous exposure of humans to different types of chemicals because endocrine active chemicals can act in concert. Information on exposure is particularly important for the developing organism at its most sensitive early life stages. Human milk was chosen because it provides direct information on exposure of the suckling infant and indirect information on exposure of the mother during pregnancy."



An important question during the research was: To what extent lifestyle can influence the presence of chemicals in breast milk? This question was the foundation for the preparation of the questionnaire. The questions were focused particularly on the use of cosmetic products; information on the relationship between the exposure of human populations to constituents of cosmetics and the presence of these constituents in the human body was limited and, in the case of UV filters, absent.

Gert-Jan Geraeds, Executive Publisher of *Chemosphere* commented, "This study once again emphasizes the importance of global research on the impact of contaminants in the human environment and the need for continuous critical assessment of our priorities in environmental health and consumer habits. I am sure that this investigation will also spark debate at the upcoming first Environmental Health conference in Brazil, February 2011".

More information: The article Exposure Patterns of UV Filters, Fragrances, Parabens, Phthalates,Organochlor Pesticides, PBDEs, and PCBs in Human Milk. Correlation of UV Filters with Use of Cosmetics by Margret Schlumpf et all will be published in Chemospehere, later this year. <u>DOI:10.1016/j.chemosphere.2010.09.079</u>

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