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## Pharmaceutical Residues: How to Effectively Lower Occurrence in the Environment

**International experts met at the Deutsche Bundesstiftung Umwelt (DBU) to discuss strategies for making pharmacy more sustainable.**

The growing problem of environmental impacts of pharmaceuticals can only be solved with an integrated strategy that combines the development of more sustainable products, with the environmental-conscious handling of medicine on the part of physicians, pharmacists and patients and the optimisation of municipal waste water treatment. This conclusion was drawn by Dr. Florian Keil (Institute for Social-Ecological Research), Prof. Dr. Klaus Kümmerer (University Hospital Freiburg) and Dr. Hans-Christian Schaefer (Deutsche Bundesstiftung Umwelt) at the first international conference on "Sustainable Pharmacy" in Osnabrück, Germany. On April 24-25 around 50 renowned experts were discussing strategies aiming at keeping tons of pharmaceutical agents off water bodies in order to prevent the contamination of water resources and the exposure of aquatic organisms. According to the experts pharmaceutical agents are in most cases not entirely metabolised in the human body and are so robust that even modern sewage plants cannot eliminate them.

### Pharmaceuticals: A Problem for the Environment

In front of experts from science and industry as well as representatives from administration, water management, health care and environmental research Prof. Kümmerer pointed out that although pharmaceutical products are crucial for maintaining physical health and general well-being one will have to find ways to reduce their impact on the environment. "If we want to make pharmaceuticals more sustainable it will be necessary to consider their entire life-cycle: development, production, application and disposal."

### Development of Environmentally Benign Pharmaceuticals

If for example the environmental properties of pharmaceuticals were explicitly taken into account already at the beginning of the development process, more environmentally benign alternatives could principally be selected. Important progress in this respect is expected in the future by computer based methods for the targeted development of 'green' pharmaceuticals. A promising approach is also the development of drugs that act pinpoint at the location in the body where they are needed. By this means therapeutic doses and thus environmental loads can likely be reduced.

### Role Model Sweden: Environmental Classification of Pharmaceuticals

Another possibility to make pharmacy more sustainable is to classify pharmaceutical agents according to their hazardous potential for the environment. Dr. Keil stated that such an open-access classification scheme is already enabling physicians in Sweden to preferentially prescribe environmentally benign

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medication. However, in order for such a scheme to be accepted, the physicians' and pharmacists' awareness for the topic has to be increased.

### **Improving Waste Water Disposal: Sustainable Sanitation**

The experts underlined that even if significant progress in the above mentioned areas will be achieved, an improved waste water treatment remains indispensable. Sustainable sanitation concepts, which are based on the separate collection of the different kinds of sewage at their place of origin thus allowing a more efficient treatment are here a promising perspective. These already well developed concepts could be implemented for example in development areas and hospitals. In addition an upgrade of municipal sewage treatment plants has to be taken into consideration.

### **Returning Unused Medicine to Pharmacies**

Additional regulatory measures have to be taken if anything else fails, according to the experts. The creation of an incentive-system was discussed which could help encourage the development of sustainable pharmaceuticals. Generally, however, it was argued that society as whole has to take responsibility. DBU expert Dr. Schaefer stated: "Everyone can contribute. We as patients should find out if alternative treatments apart from conventional medication might be able to help with ailments. And of course: unused medication should under no circumstances be flushed down the toilet but should go into the garbage, or better should be returned to the pharmacy.

Conference contributions can be downloaded at:

[http://www.dbu.de/550artikel27307\\_147.html](http://www.dbu.de/550artikel27307_147.html)