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# Occurrence, fate and effects of pharmaceutical substances in the environment- A review

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## Abstract

Medical substances (pharmaceuticals) are a group of substances that until recently have been exposed to the environment with very little attention. The reason why they may be interesting as environmental micropollutants, is that medical substances are developed with the intention of performing a biological effect. Especially antibiotics used as growth promoters, as feed additives in fish farms are anticipated to end up in the environment. Very little is known about the exposure routes of the medical substances to the environment. Only few investigations have reported findings of medical substances in other field samples than sediment or treated waste water samples. Several substances seem to be persistent in the environment. This paper outlines the different anticipated exposure routes to the environment, summarises the legislation on the subject and gives an outline of present knowledge of occurrence, fate and effect on both the aquatic

and terrestrial environments of medical substances. Present knowledge does not reveal if regular therapeutic use may be the source of a substance carried by sewage effluent into the aquatic system, even though clofibrate, a lipid lowering agent, has been identified in ground and tap water samples from Berlin. Further research would be necessary to assess the environmental risk involved in exposing medical substances and metabolites to the environment.



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## Keywords

medical substances; pharmaceuticals; environmental fate; toxicity; legislation

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