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# Endocrine disrupting chemicals and emerging contamination issues

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Evidence suggests that environmental exposure to some anthropogenic chemicals may result in disruption of endocrine systems in human and wildlife populations. This disruption can happen through altering normal hormone levels, halting or stimulating the production of hormones, or changing the way hormones travel through the body, thus affecting the functions that these hormones control. Chemicals that are known human endocrine disruptors include diethylstilbesterol (the drug DES), dioxin, PCBs, DDT, and some other pesticides. Many chemicals, particularly pesticides and plasticizers, are suspected endocrine disruptors based on limited animal studies.

The problem of persistent organic chemicals, popularly recognized as POPs was thought to be over but they reappear from buried sources during developmental activities. Several new chemicals such as flame retardants are recognized as persistent and could possibly be "future PCBs". There are very limited studies on these chemicals that are widely used in electronic, electrical, automobile and textile industries, especially in Korea. Off shore sewage dumping, a potential source of several industrial and human health chemicals, is still practiced in Korea adding chemical burden to local environment.

Problematic compounds of the future are household chemicals (perfluorooctanesulfonate (PFOS), pharmaceuticals, and other consumables as well as biogenic hormones. These chemicals are released directly to the environment after passing through wastewater treatment processes (via wastewater treatment plants, or domestic septic systems), which often are not designed to remove them from the effluent. Veterinary pharmaceuticals used in animal feeding operations may be released to the environment with animal wastes through overflow or leakage from storage structures or land application. Surprisingly, little is known about the extent of environmental occurrence, transport, and ultimate fateof hormonally active chemicals,

personal care products, and pharmaceuticals that are designed to stimulate a physiological response in humans, plants, and animals. One reason for this general lack of data is that, until recently, there have been few analytical methods capable of detecting these compounds at low concentrations which might be expected in the environment. However, using new generation, high sensitive, high resolution instruments such as HRGC-HRMS, HPLC-HRMS it is possible to determine these chemicals in drinking water, freshwater reservoirs and in coastal waters.

Once proper methodologies are developed for these trace chemicals, degradation processes, human exposure pathways and bio-geochemistry of these chemicals can be studied easily. With enough monitoring data contaminant models can be developed.