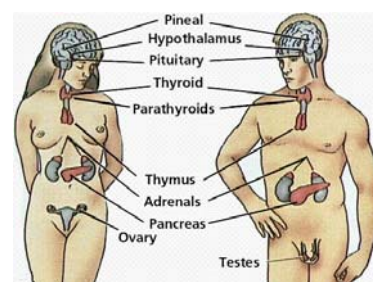


BEUC Factsheet

Endocrine Disrupting chemicals

1 What is the endocrine system of our organism?

The body's three great integrating networks are the nervous, immune and endocrine systems. Together with the brain, they all have multiple interconnections. The endocrine system is made of glands, hormones and receptors and uses chemical signals to control and maintain crucial body functions throughout our lives. Changes in one part of the system may lead to dramatic and unexpected consequences elsewhere.

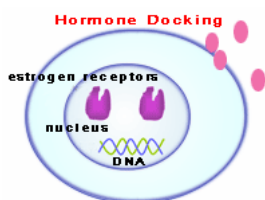


Source: <http://www.emc.maricopa.edu/faculty/farabee/biobk/biobookendocr.html>

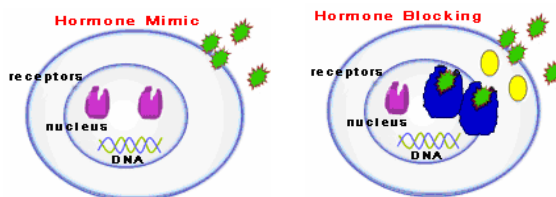
2 What are endocrine disrupting chemicals (EDCs)?

These are chemicals which mimic natural hormones such as estrogen and testosterone. As they act like natural hormones, they give wrong messages or block the right messages in our body from getting through. Hormones and receptors normally fit together like a "lock and key" mechanism. However, also foreign substances can interfere with hormones through interfering with receptors inside cells.

The healthy process of body hormones docking to the right receptors looks as follows:



The disturbed process through hormone mimicking and hormone blocking chemicals looks as follows:



Source: <http://e.hormone.tulane.edu/learning/docking-receptor-binding.html>

In addition to synthetic chemicals, there are also natural estrogens in plants which act like hormones such as for example isoflavones in soya beans. It is important to note that man-made chemicals fundamentally differ from plant estrogens as the body is able to break down and excrete the natural estrogens while many of the man-made chemicals resist the break-down and accumulate in the body. This leads to a low-level but long term exposure with unknown effects.



3 Why is it crucial to protect pregnant women and children from EDCs?

Until a couple of decades ago, scientists still believed that the placenta shielded cord blood would protect the unborn child from most chemicals and pollutants. However, studies which analyse the blood of newborn babies show that their blood already contains hundreds of hazardous chemicals such as heavy metals, flame retardants, dioxins, phthalates and pesticides. Many of the substances that have been found in newborn babies are known to cause cancer, to be toxic to the brain and nervous system and are suspected to disturb the hormonal system.

Contact with EDCs during critical stages of development in the womb seems to cause serious health effects which may become evident only decades later, e.g. when a child reaches puberty or anytime later. Studies with animals showed that hormones during pregnancy “programme” cells, organs, the brain and behavior before birth and thereby set the individual’s track for the entire lifetime. It seems that the actual timing of the exposure seems to be more important than the actual dose.

4 Are there low-dose effects?

Whether or not there are low-dose effects which are responsible for endocrine disruption is controversially discussed. Traditional toxicology usually asks how high levels of contamination are which affect health. When it comes to EDCs, some studies conclude that there is an effect at much lower doses than would normally be expected to have a negative effect. For this reason, it cannot be excluded that toxicologists who are responsible for assessing exposure have been misguided in past decades and have given false assurances of safety. Industry usually challenges findings on low-dose effects and say that these are not reliable.

However, as several studies found low-dose effects and as the inherent sensitivity of the endocrine system is only partly understood, it is quite likely that there are such low-dose effects. Moreover, as little amounts of chemicals in our body add to other small or large quantities of chemicals, there is an additive effect and even tiny amounts could lead to very negative health effects.

5 Which consumer products contain EDCs?

Every day we come in contact with an enormous range of man-made chemicals which are contained for example in food, cosmetics, textiles, toys and furniture. We use skin creams with parabens, computers with brominated flame retardants and hair dyes with resorcinol. Our plastic kitchen tools contain bisphenol A and our shower curtains contain phthalates. Children’s toys are full of polycyclic aromatic hydrocarbons and nonylphenol and plenty other hazardous chemicals. In other words, we are continuously exposed to chemicals from all the products we encounter in our everyday lives. Many of these chemicals are proven or suspected to affect the hormonal system of humans and animals. For the individual consumer it is almost impossible to know which products contain these chemicals. That is why BEUC members who carry out comparative product testing look at the chemical content of consumer products.

6 BEUC demands

- Reduce exposure to endocrine disrupting chemicals. To this end, the European Commission and the European Parliament need to drive forward the policy strategies to protect consumers and the environment better from endocrine disrupting chemicals.
- A science based definition for “endocrine disruptor” needs to be developed which will be applicable coherently to all existing and future EU legislation. Ideally such a definition will also be used at international level. It will be important that the definition covers confirmed endocrine disruptors as well as substances which are suspected to have endocrine disrupting



- In addition to a definition, a set of criteria needs to be developed which will allow authorities and industry to assess whether a substance should be considered as endocrine disrupting.
- REACH requires manufacturers, importers and downstream users to ensure that the substances they place on the market do not adversely affect human health and the environment. As this basic principle also applies to endocrine disruptors, we expect registrants under REACH to assess whether the substances are endocrine disruptors or potential endocrine disruptors. When assessing the chemical safety, the endocrine disrupting properties need to be taken into account and appropriate risk management measures have to be taken.
- Under REACH, the role of authorities is to evaluate registered substances and to propose appropriate risk management measures. When screening the registrants' chemical safety assessments, authorities should not only consider the information of the REACH dossier but also take into account other available information to assess whether or not the substance is endocrine disrupting or potentially endocrine disrupting.
- As part of the EU strategy on endocrine disruptors, the European Commission identified a priority list of substances for further evaluating their role in endocrine disruption. However, this list was established several years ago and should be updated taking into account REACH registration dossiers and new available data.
- EDCs which have been identified as Substances of Very High Concern (SVHC) should be included in Annex XIV of the REACH Regulation. Consequently the use of these substances needs authorization.
- Risk assessment and risk management methods have to be updated to take into account low-dose effect of EDCs as well as the added effect of different chemicals.
- More EU-funded research is needed to better understand the complexity of the endocrine system and the negative health effects of endocrine disrupting chemicals on human health and on the environment.
- Use the precautionary principle and ban the use of EDCs in consumer goods if safer alternatives are available.

7 Literature

The information of this factsheet is based on the following publications:

1. Theo Colborn, Dianne Dumanoski and John Peterson Myers (1996): Our Stolen Future. Are we threatening our fertility, intelligence, and survival? A scientific detective story.
2. German Federal Institute for Risk Assessment (2010): Questions and Answers on endocrine disruptors, http://www.bfr.bund.de/cm/279/questions_and_answers_on_endocrine_disruptors.pdf
1. Women's Reproductive Health and the Environment Workshop report: Girl disrupted, Hormone Disruptors and Women's Reproductive Health, January 6-9, 2008, Bolinas, CA.
2. The website of the European Commission on endocrine disruptors: http://ec.europa.eu/environment/endocrine/definitions/index_en.htm