GreenFacts Highlights
Facts on Health and the Environment
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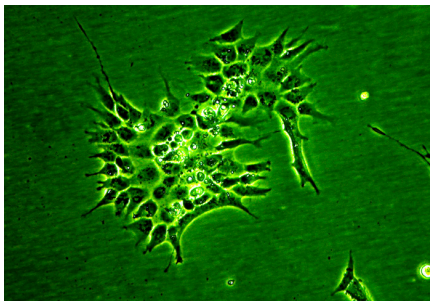
Methods for the assessment of endocrine disruptors



➔ WHAT ARE ENDOCRINE DISRUPTORS?

Endocrine disruptors are substances, either natural or of human synthetic origin, that have an effect considered to be negative on the endocrine system.

The endocrine system is composed of various glands and organs in the body that play various roles in maintaining the good physiological status of the body. It includes for instance the adrenal glands, the thyroid, the testes and ovaries. The endocrine system influences almost every cell, organ, and function of an organism.

It regulates, by the use of numerous molecular messengers known as hormones, various vital functions such as metabolism, growth and development, tissue function, or mood, from conception through adulthood and into old age. This includes for example the development of the brain and nervous system, the growth and function of the reproductive system, or the regulation of blood sugar level.

The endocrine system can be, and often is, affected by external factors, such as chemicals. There are many synthetic or natural substances that can interact with the endocrine system, and if the interaction creates problems, the substance is considered to be an 'endocrine disruptor'.

➔ WHAT KIND OF SUBSTANCES CAN INTERFERE WITH THE ENDOCRINE SYSTEM?

Many substances released into the environment through human activity can potentially interfere with the endocrine or hormonal systems of animals and humans. Such endocrine active substances (EASs) include synthetic drugs, pesticides, compounds used in industry and in consumer products, industrial by-products and pollutants, including some metals.

There is also a large number of substances of natural origin that can interact with the endocrine system. These substances occur in plants consumed as food or feed, and also as contaminants from fungi that may be present in food and feed.

This is because the endocrine system functions, like many other systems in the body, in a 'lock and key' model, where a signalling molecule – in this case an hormone – is 'recognized' by a cellular structure named "a receptor " by fitting in it. For many hormones, these receptors are at the surface of the cells, and the biochemical message they carry tells the cell to do something specific, from growing to producing a specific compound, or to any of a myriad of functions a cell can accomplish. Any compound that either fits the 'lock' instead of the hormone or prevents the 'key' from entering the lock e.g. by masking it, can potentially disturb the system by sending a false signal, or by preventing a signal from reaching its intended target.

➔ ARE THERE SPECIFIC ISSUES WITH THE EVALUATION OF ENDOCRINE DISRUPTORS?

There are a number of key issues with the evaluation of potential endocrine disruptors:

- There is no clear scientific definition of what a 'problem'is, when it comes to the endocrine system, and as such, a standard evaluation of chemicals is difficult. This is in part due to the fact that there are so many different ways that chemicals can interact with the endocrine system;
- The concentrations of any substance that would have an endocrine effect can be very low, sometimes even lower that the detection limit of standard measuring methods. This makes it very difficult to evaluate a cause and effect relationship, for instance;
- It is difficult to define below which concentration endocrine disruptors cause no problem;
- There is a lack of standard evaluation methods for many of the numerous ways that endocrine disruptors can interact with an organism.

The opinion of the committee is thus that for their risk assessment, EDs can be treated like most other substances of concern for human health and the environment. But, it adds that the level of concern is not determined exclusively by risk assessment but also by protection goals set by the risk management.

These are highlights of the report: **"The scientific criteria for identification of endocrine disruptors and appropriateness of existing test methods for assessing effects mediated by these substances on human health and the environment.", a report produced by the European Food Safety Agency.**

You can find more information in this topic on the GreenFacts website : www.greenfacts.org/en/evaluation-endocrine-disruptors/