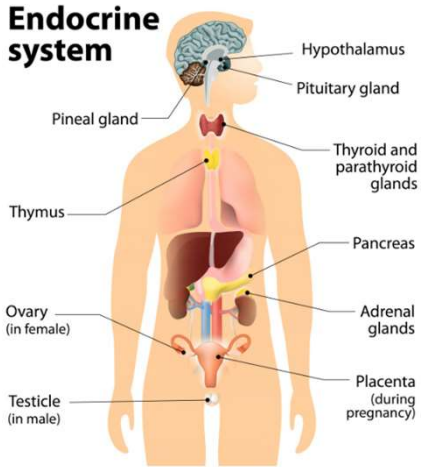


Understanding Endocrine Disruptors



<https://www.epa.gov/endocrine-disruption/overview-endocrine-system>

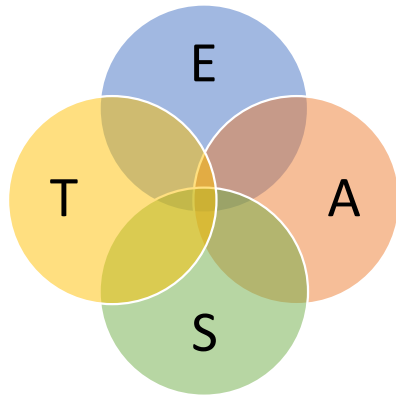


Our understanding of systems biology is ever increasing.

Parameters relevant for identification of endocrine-disrupting properties are grouped by modalities:

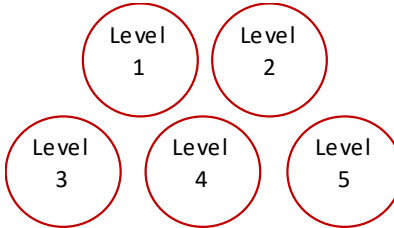
- Estrogen (E) modality
- Androgen (A) modality
- Thyroid (T) modality
- Steroidogenic (S) modality

(Collectively known as EATS).



Our understanding of how the endocrine system is influenced by exogenous substances is also growing.

OECD Conceptual Framework for testing and assessment of Endocrine Disrupting Chemicals (OECD, 2018)



<https://www.oecd.org/env/ehs/testing/oecdworkrelatedtoendocrinedisrupters.htm>

The tools we use to detect endocrine disruptors have and will continue to improve.

An endocrine disruptor (ED) is an exogenous substance or mixture that alters function(s) of the endocrine system and consequently causes adverse health effects in an intact organism, its progeny or (sub)populations.
- WHO/IPCS (2002)

<https://www.who.int/publications/i/item/9789241505031>

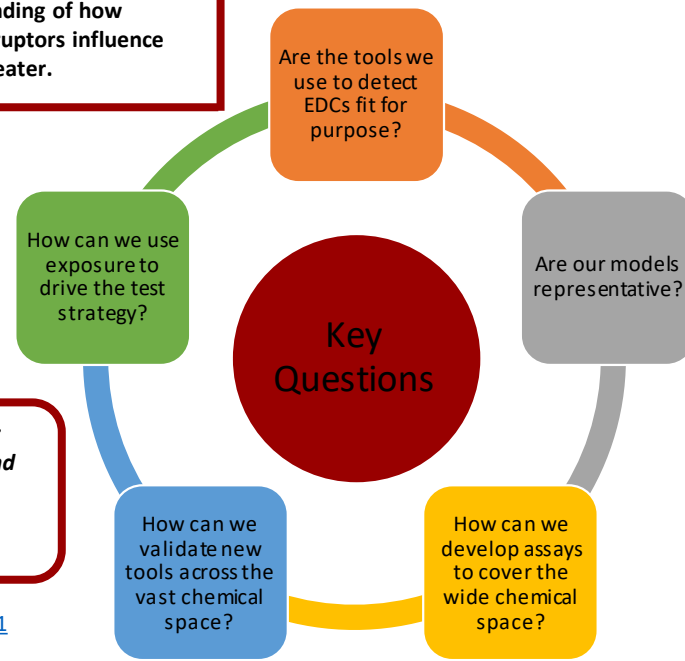
Concerns:

- Endocrine-related cancers.
- Reproductive effects in humans (e.g., effects on fertility).
- Developmental effects (e.g., developmental neurotoxicity).
- Reproductive effects in wildlife.

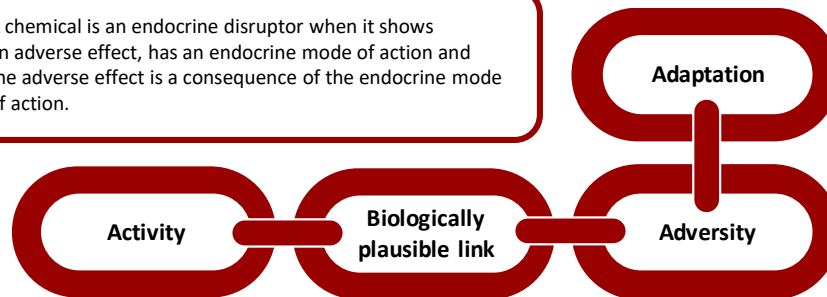
Our understanding of how endocrine disruptors influence the body is greater.

But we still have a long way to go.

The situation is more complex still for mixtures.



A chemical is an endocrine disruptor when it shows an adverse effect, has an endocrine mode of action and the adverse effect is a consequence of the endocrine mode of action.



One challenge is to determine and differentiate a true adverse effect from an adaptive effect. This important aspect is subject to expert judgement.