

MODULE 1

Tox-free, circular, and climate-friendly buildings

1.4. 10 FACTS – Construction materials and health

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Co-funded by
the European Union



SUSTAINABLE WATERS

NonHazCity 3



NONHAZCITY

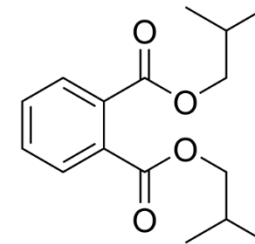
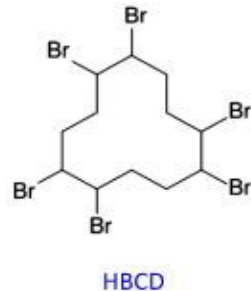
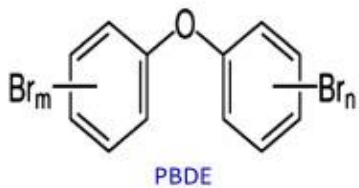
FACT 1

We spend **80 %**
of our time indoors



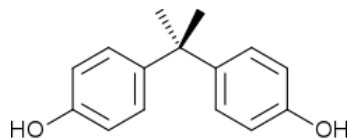
FACT 2

Indoors we are exposed to various **hazardous substances (HS)**

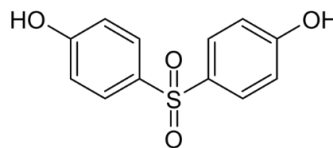


brominated flame retardants (BFRs)

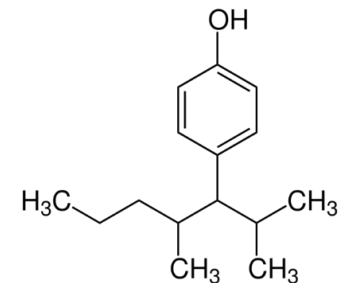
phthalates



bisphenol A (BPA)



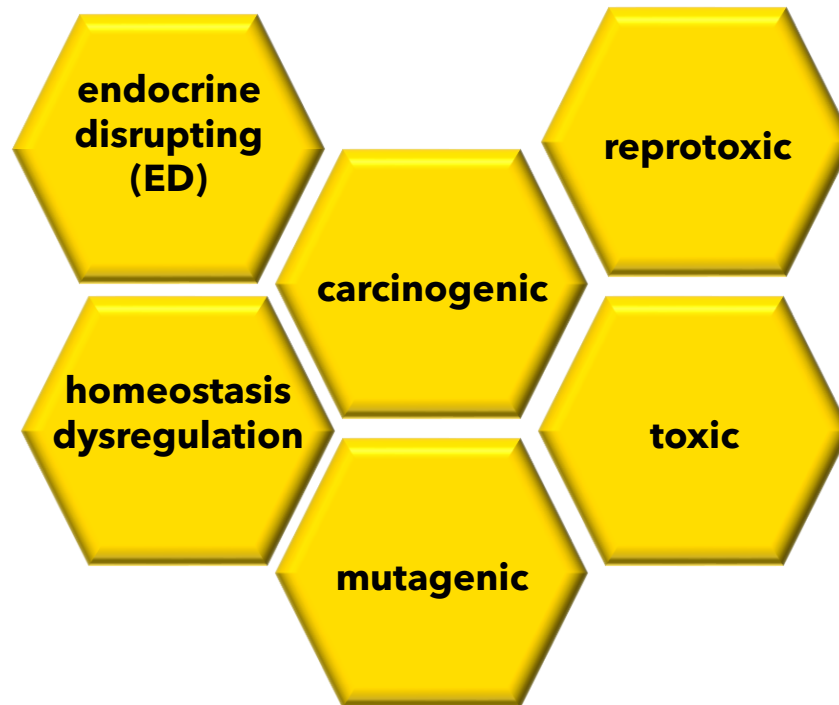
bisphenol S (BPS)



nonylphenol

FACT 3

Hazardous substances cause various **adverse health effects**



FACT 4

HS doses and their **effects**

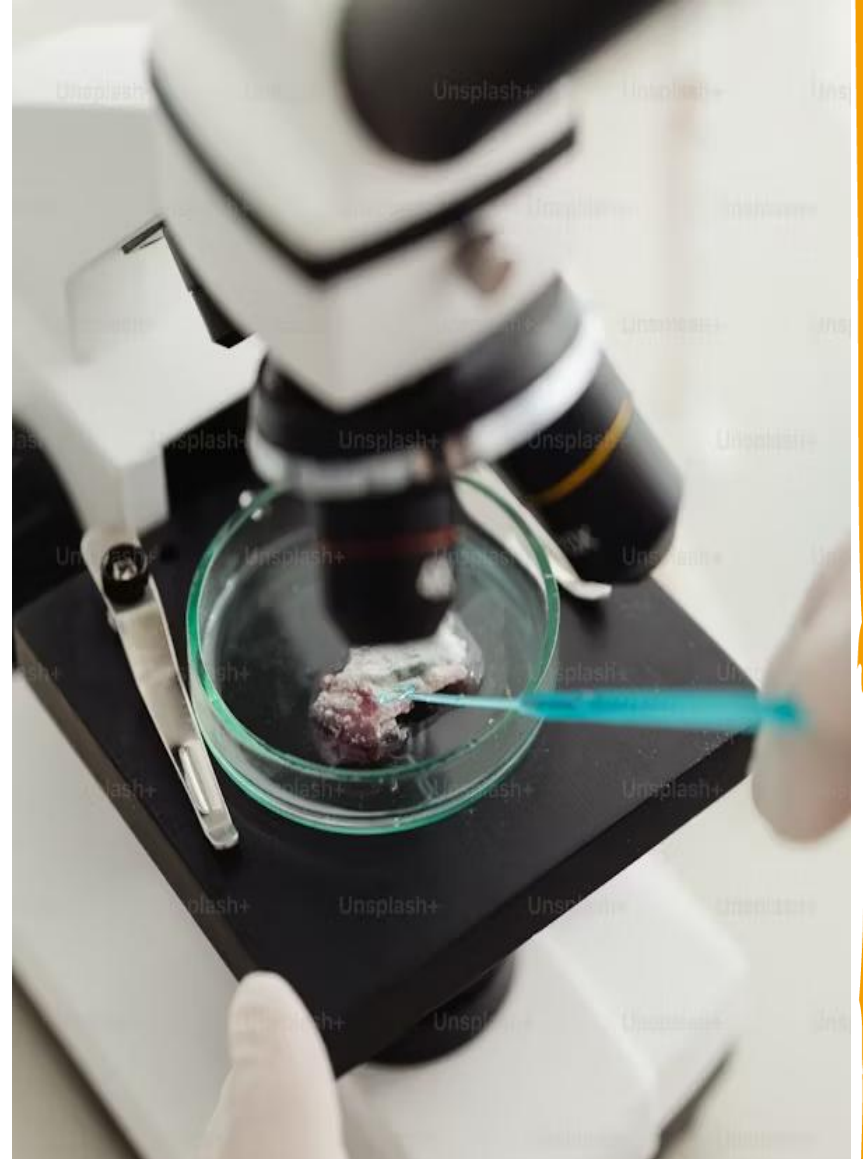
- Dose is crucial for toxic substances
- EDs - dose as in the action of hormones (very, very low, effects not related to dose change)
- The significance of HS dose changes in the mixture of various compounds
- Age: infants and children may have a higher EDC burden for a given dose compared to adults



FACT 5

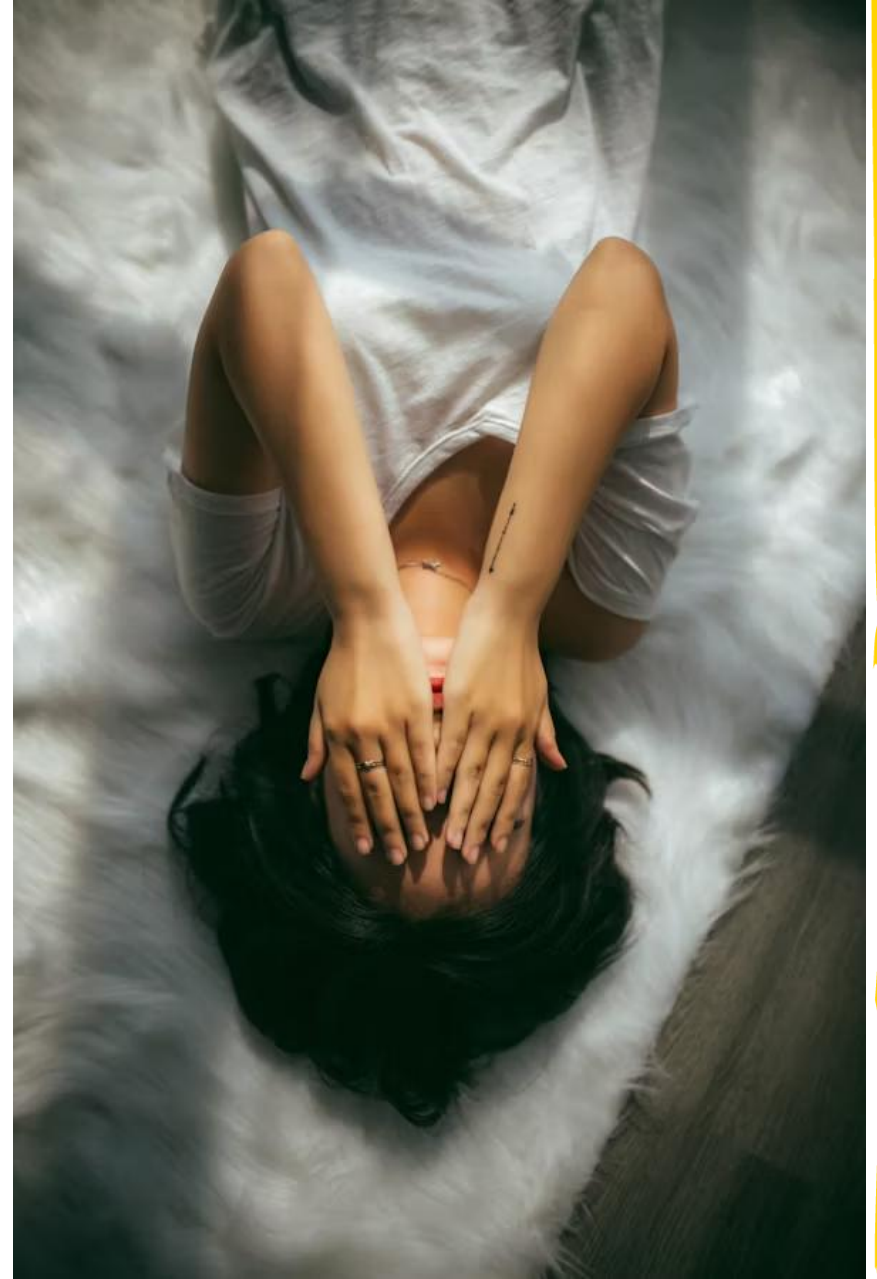
EDs can exert effects either as unchanged substances or after their biotransformation into metabolites that can be **more potent** than the parent compounds.

(Diamanti-Kandarakis et al., 2009)



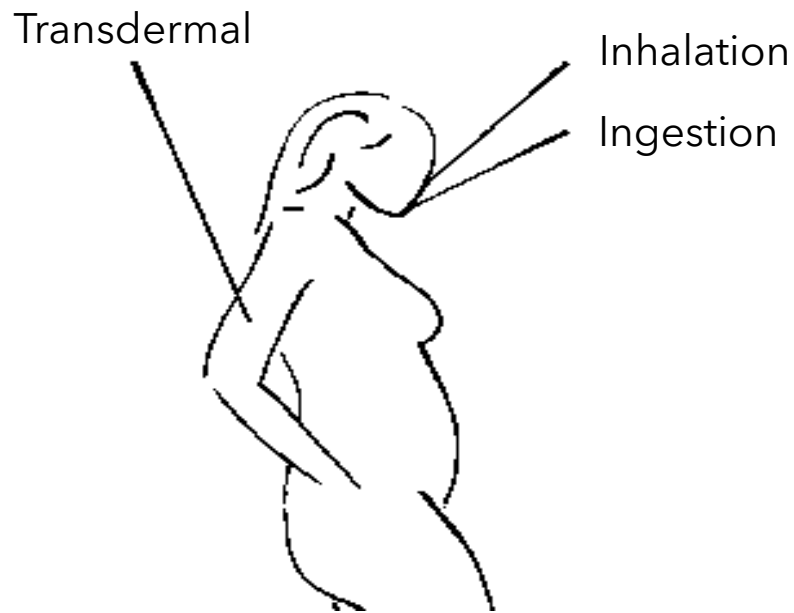
FACT 6

We are exposed to a **mixture of substances** with various potential of adverse health effects!



FACT 7

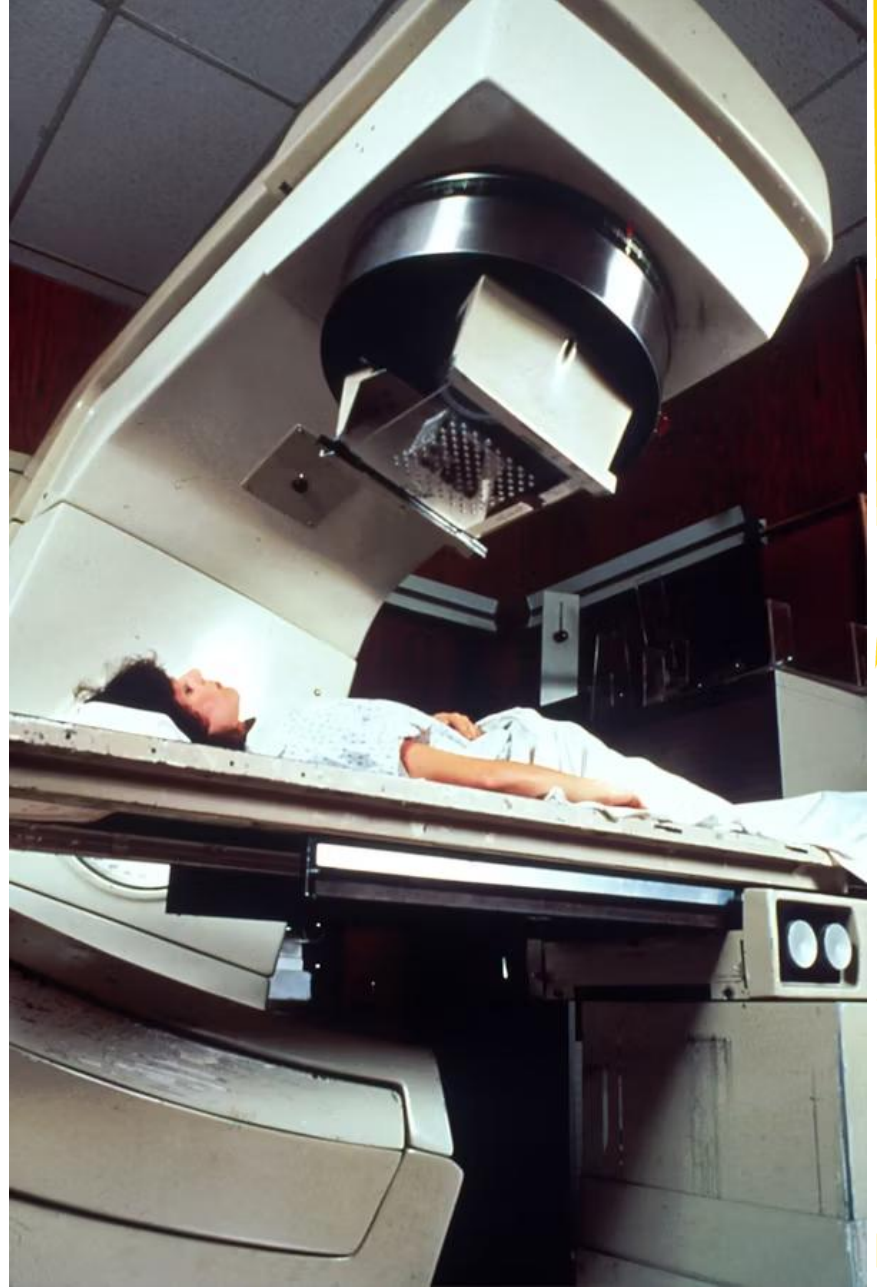
The route of exposure can affect the **bioavailability** of Eds.



(Lehle and McCarrey, 2020)

FACT 8

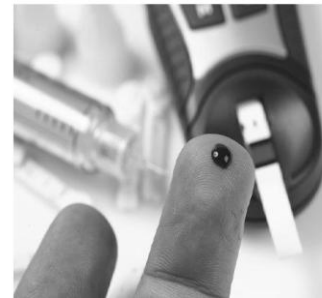
Hazardous substances emitted from **construction materials** have a lot of adverse health effects.



Adverse health effects of hazardous substance exposure

Hormone dependent cancers
Obesity, diabetes, and insulin resistance
Fertility disorders in men and women

Developmental disorders
Cardiovascular diseases
ADHD, autism



Premature puberty
Allergy and asthma
Thyroid disorders
Metabolic disorders

Endometriosis
Low birth weight (...)





HAZARDOUS
SUBSTANCES
FROM
CONSTRUCTION
MATERIALS

METABOLIC
DISRUPTION

- ↑ ADIPOGENESIS
- ↑ OBESITY
- ↑ INSULIN RESISTANCE
- ↑ HYPERINSULINAEMIA
- ↑ OXIDATIVE STRESS
- ↑ INFLAMMATION

ENDOCRINE
DISRUPTION

REPRODUCTIVE
DISRUPTION

- ↑ OVARIAN STEROIDOGENESIS
- ↑ HYPERANDROGENISM
- ↓ OOCYTE DEVELOPMENT
- ↓ FOLLICULAR GROWTH

CANCER
DIABETES TYPE 2
ATHEROSCLEROSIS

FERTILITY
PROBLEMS

FACT 9

Timing/ vulnerable groups/ window of susceptibility



First trimester
of pregnancy

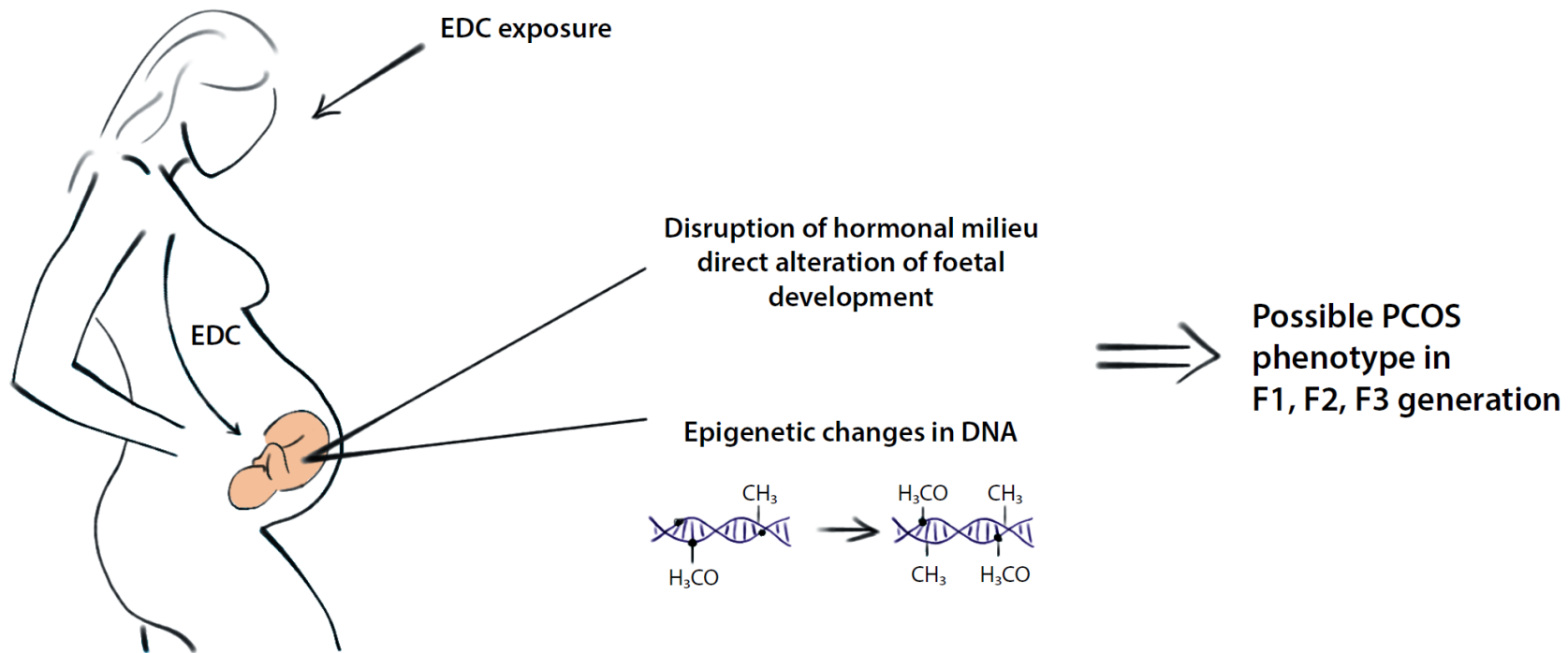


Hand- or
object-to-mouth
activity



The growing organism
is susceptible to
hazardous substances

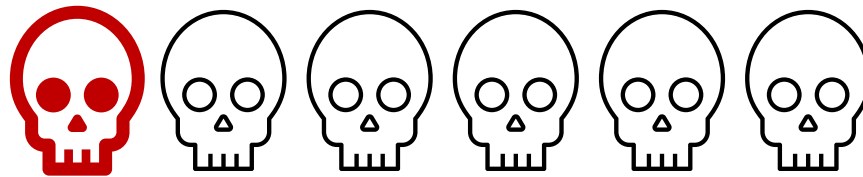
(Miller et al., 2002)



Rutkowska A., Diamanti-Kandarakis E., *Fertility and Sterility*, 2016

FACT 10

HS (also from home) and pollution – **we have a choice!**



9 million deaths annually = one in six deaths globally

Now is the time!

What are you changing at home **today**?

