



Should we be afraid of a rubber duck?

Plastic additives as an invisible
threat for humans
and other living beings' health

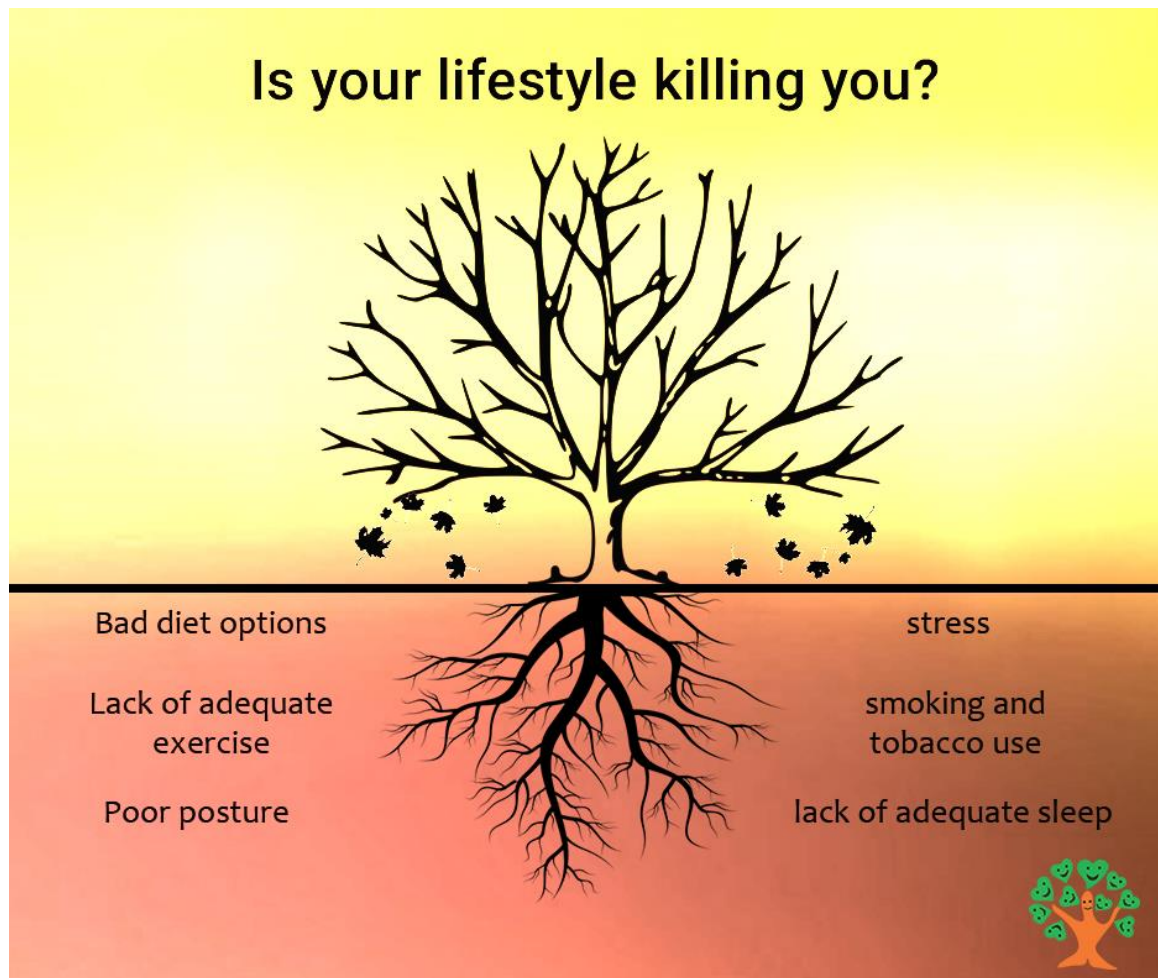
Aleksandra Rutkowska, PhD
DetoxED LTD
Medical University of Gdansk

The progress of civilization



Lifestyle diseases

diseases linked with, and often caused by the way people live their life.



Lifestyle diseases prevalence

Infertility



25%

Cancer



35%

Obesity



50%



Pathogenesis of lifestyle diseases



Genetic factors



Lifestyle



Environmental factors







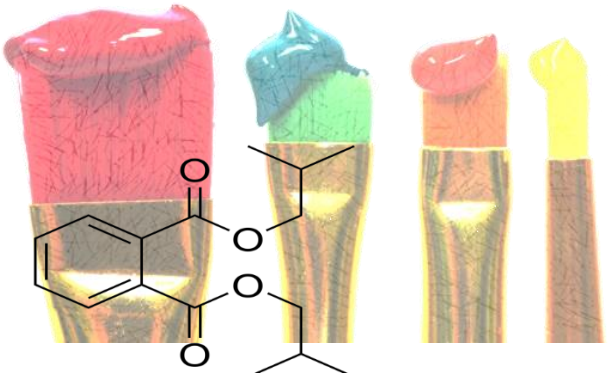
Environmental plastic pollution – visible threat



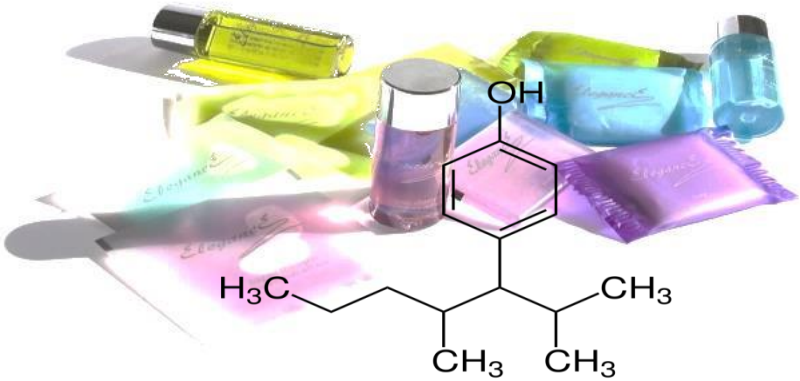
THE NEW FOOD CHAIN



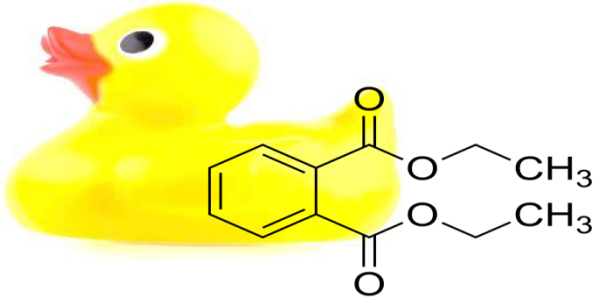
Plastic additives – endocrine disruptors (EDs)



Diisobutyl phthalate



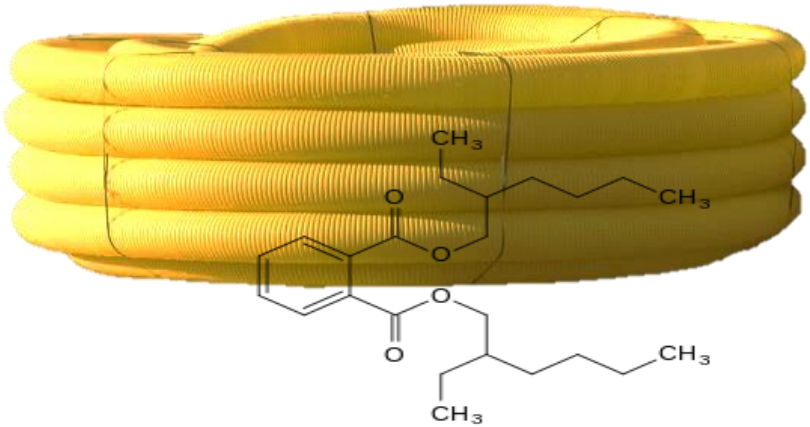
4-Nonylphenol



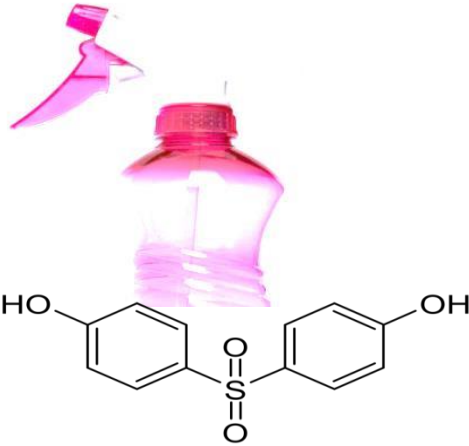
Diethyl phthalate



Bisphenol A



Diethylhexyl phthalate



Bisphenol S

Endocrine disruptors (ED*) in everyday life



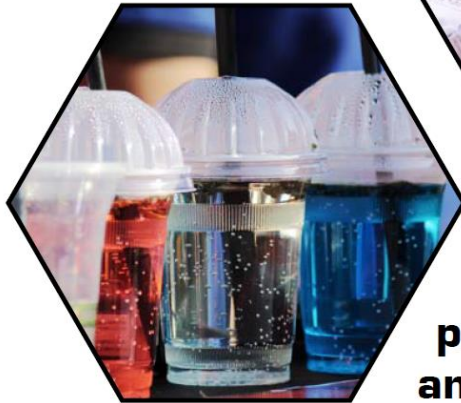
plastic food packagings



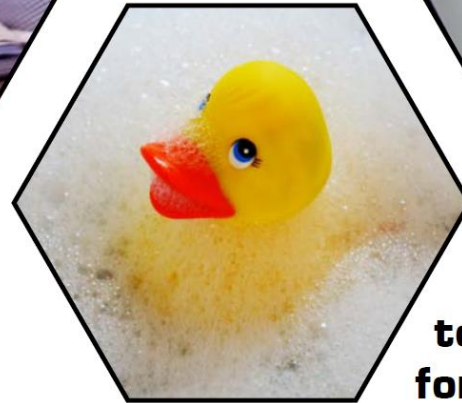
plastic bottles and electronic equipment



receipts



plastic cups and straws



toys, accessories for babies



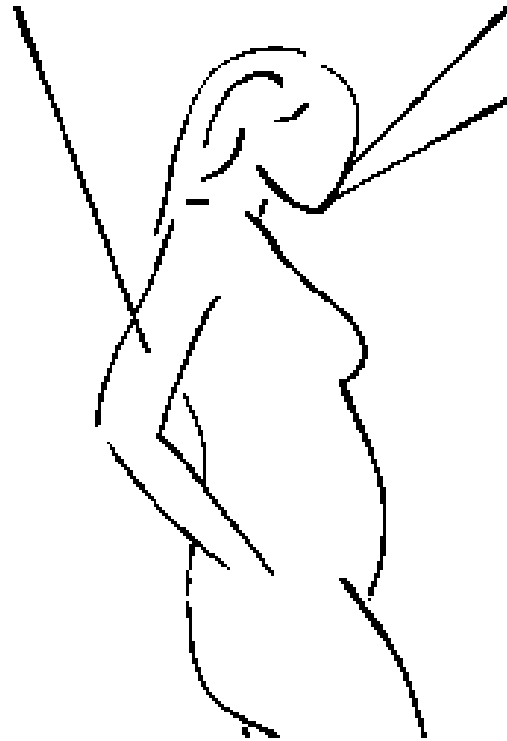
cosmetics

*ED – chemical compounds that mimic and interfere with natural hormones leading to endocrine disruption

Routes of the EDs exposure



Transdermal



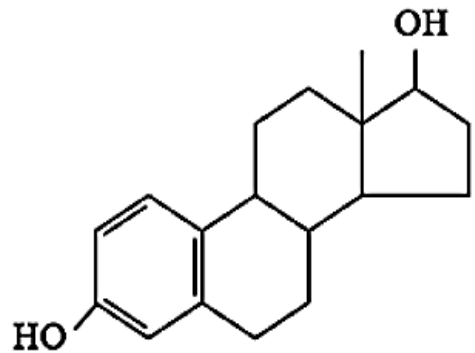
Inhalation

Ingestion

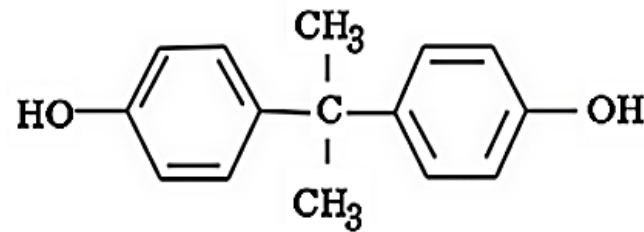


Invisible threat - EDs action in the organism

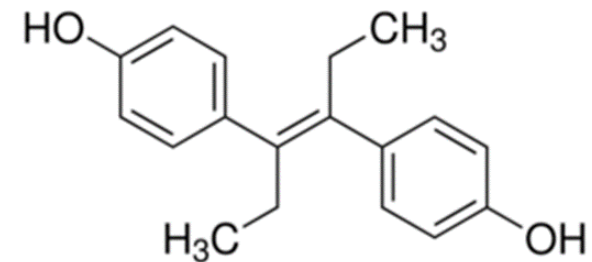
- ✦ affecting **synthesis** of hormones
- ✦ blocking or binding **hormone receptors** on target tissues
- ✦ altering **hormone metabolism** and amount or activity of hormone receptors



17β-estradiol



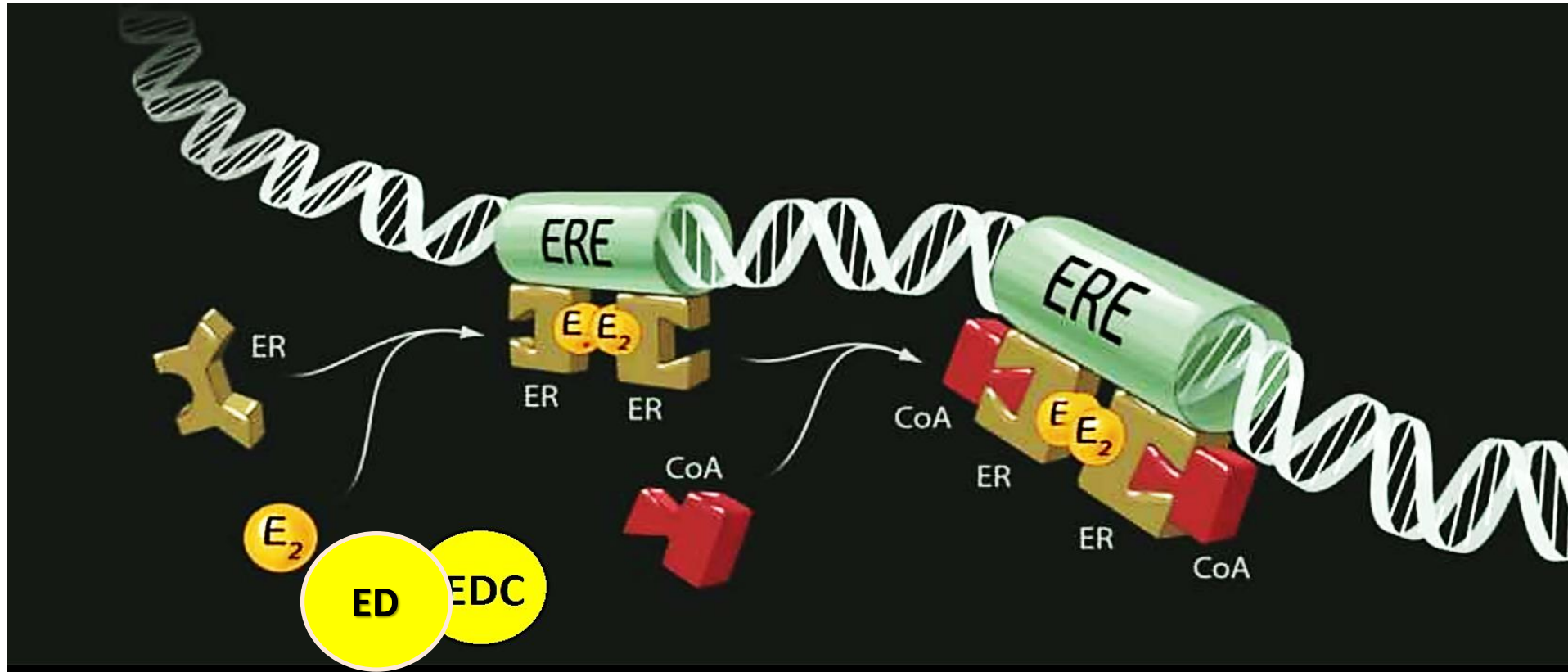
Bisphenol A
(BPA)



Diethylstilbestrol (**DES**)



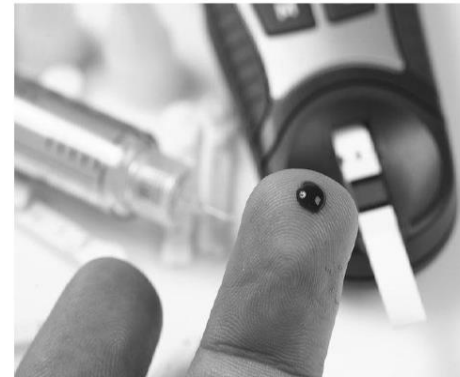
Mechanism of EDs action



Consequences of EDs 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 (...)

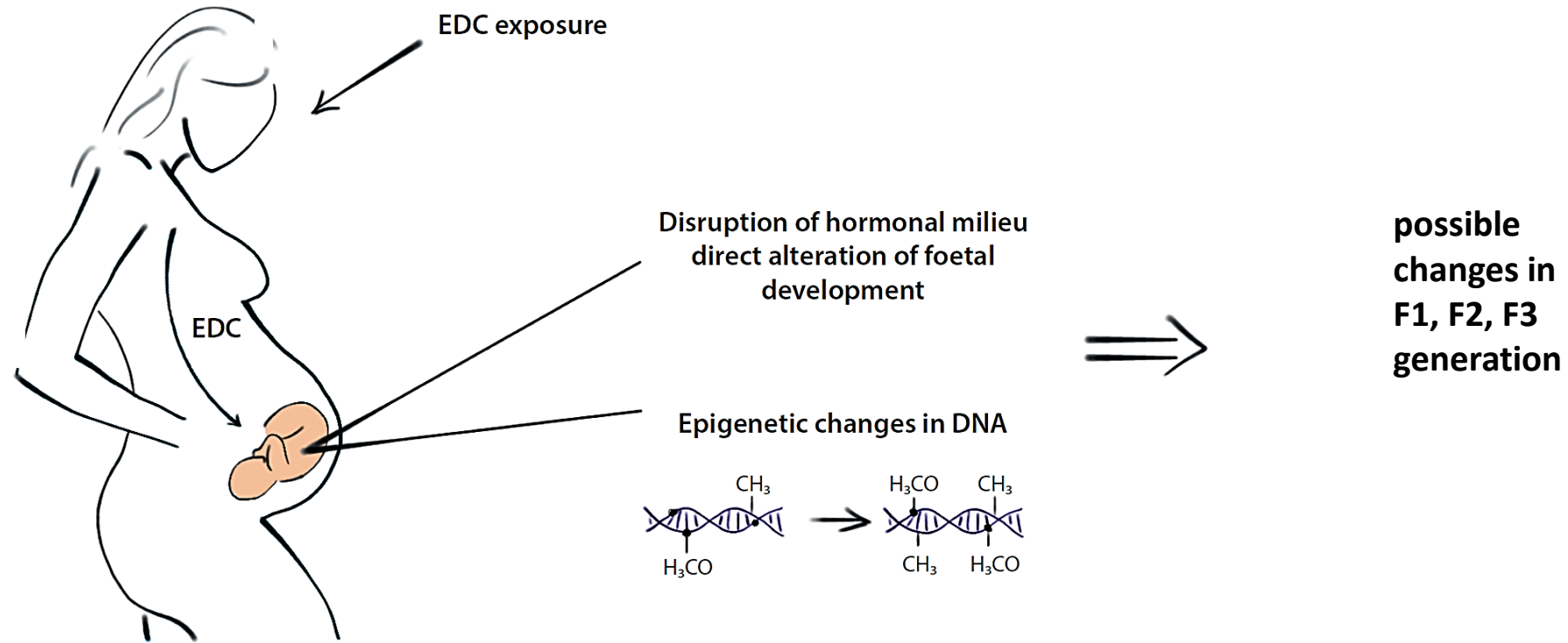
Benjamin S et al. *Journal of Hazardous Materials* 2017



The most vulnerable groups



Timing of the EDs exposure is crucial



Rutkowska A & Diamanti Kandarakis E. *Fertility and Sterility* 2016

Take home message

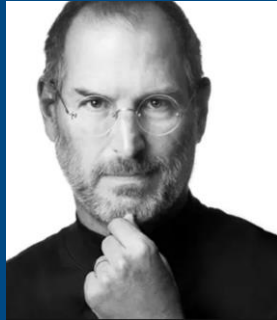
- ✦ The exposure to EDs is permanent
- ✦ Small doses (similar to hormones) affect health and increase the risk of several diseases
- ✦ Small lifestyle changes may lower the human EDs exposure, protect the environment and lower the risk of lifestyle diseases



Together we can do that!



Thank you!



„Stay hungry. Stay foolish” *(Steve Jobs)*



„Stay detoxED. Stay healthy” *(Aleksandra Rutkowska)*



NONHAZCITY