# MUNI | RECETOX



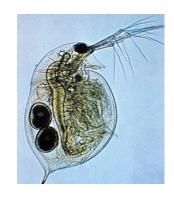
Research and Education of a Healthy Future

Jana Klánová



Chemical production and application





Chemical production and application

Assessment of harmfull effects

Environmental monitoring

Chemical production and application

**Assessment of harmfull effects** 



Environmental and health risk assessment

**Environmental** monitoring

Chemical production and application

**Assessment of harmfull effects** 



**Environmental** management

Environmental and health risk assessment

**Environmental** monitoring

Chemical production and application

Assessment of harmfull effects



**Environmental** technology

**Environmental** management

Protecting humans from environmental hazards

Environmental and health risk assessment

**Environmental** monitoring

Chemical production and application

Assessment of harmfull effects



**Environmental** technology

Protecting humans from environmental hazards

Information databases

**Environmental** management

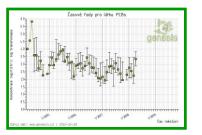
Environmental and health risk assessment

**Environmental** monitoring

Chemical production and application

**Assessment of harmfull effects** 

**Data analysis** and interpretation



**Environmental** technology

**Environmental** management

**Protecting humans** from environmental hazards

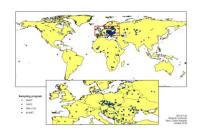
**Information** databases

**Environmental** and health risk assessment

**Environmental** monitoring

**Chemical** production and application

**Assessment of** harmfull effects



Environmental policy and international conventions

Data analysis and interpretation

Environmental technology

Protecting humans from environmental hazards

Information databases

**Environmental** management

Environmental and health risk assessment

**Environmental** monitoring

Chemical production and application

Assessment of harmfull effects

Environmental policy and international conventions

Chemical safety and population health

Data analysis and interpretation

**Environmental technology** 

Protecting humans from environmental hazards

Information databases

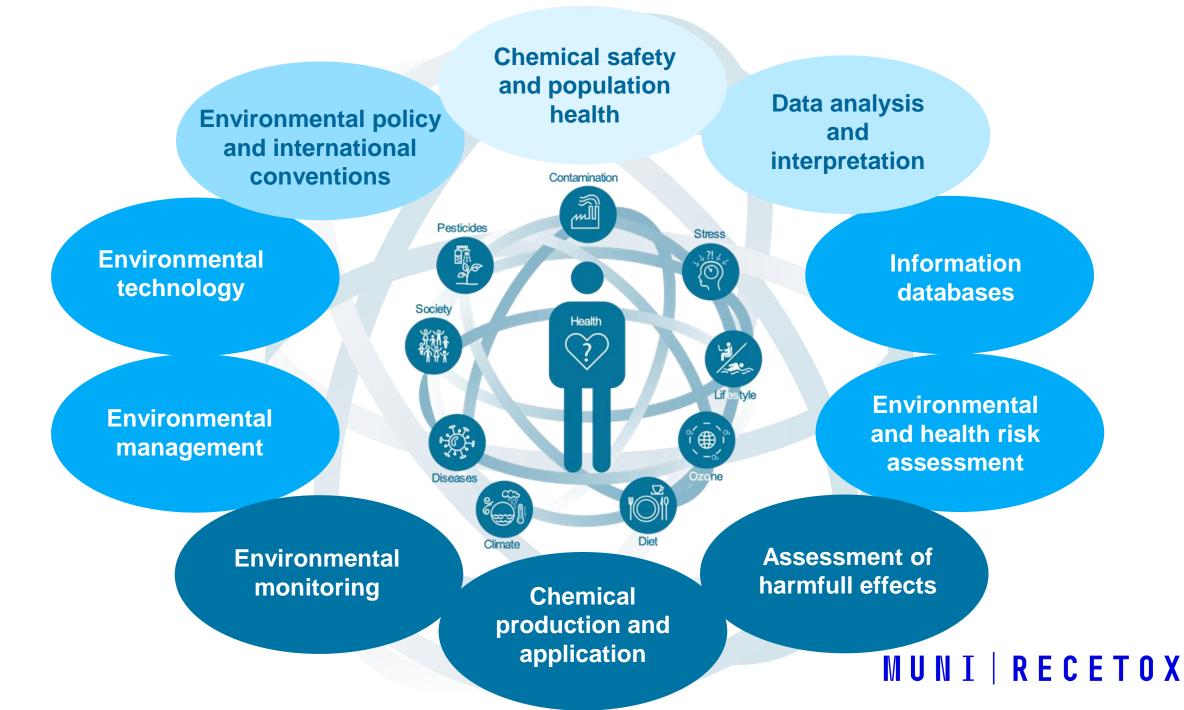
**Environmental** management

Environmental and health risk assessment

**Environmental** monitoring

Chemical production and application

Assessment of harmfull effects



Environmental policy and international conventions

Chemical safety and population health

Contamination

Stress

Pesticides

Diseases

Climate

Data analysis and interpretation

**Environmental** technology

**Environmental** management

Society
Health
EXPOSOME

Information databases

Environmental and health risk assessment

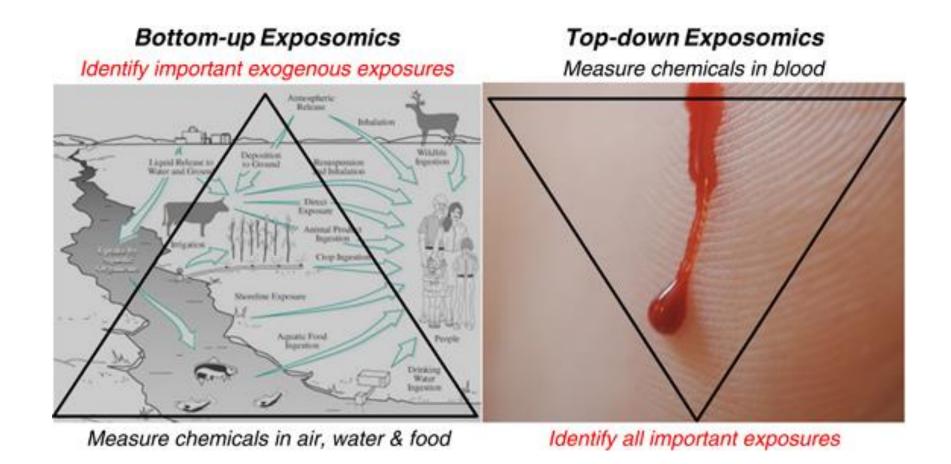
**Environmental** monitoring

Chemical production and application

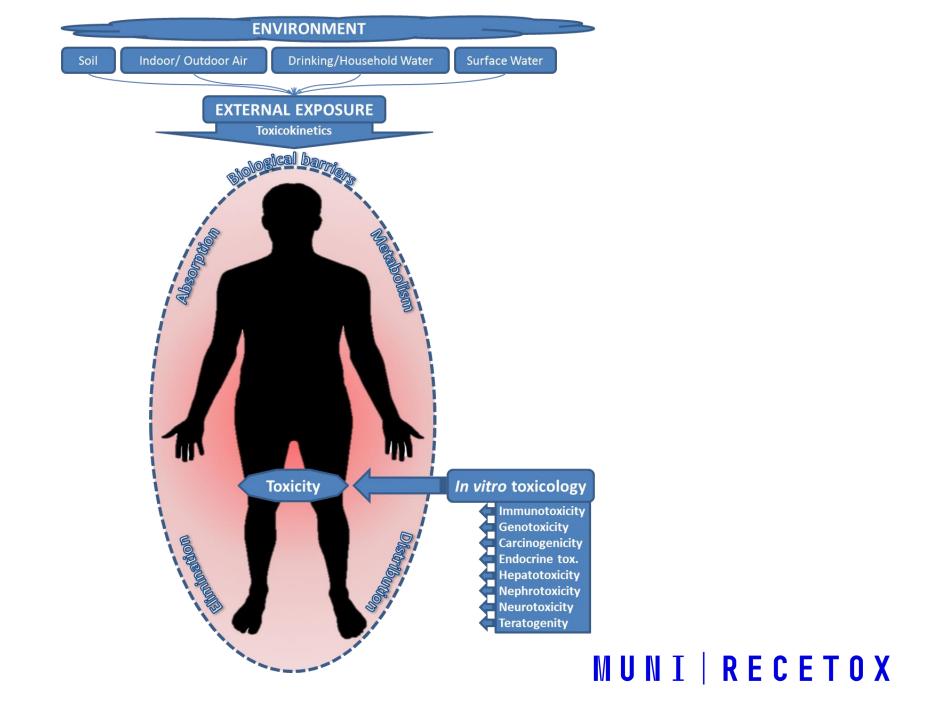
Diet

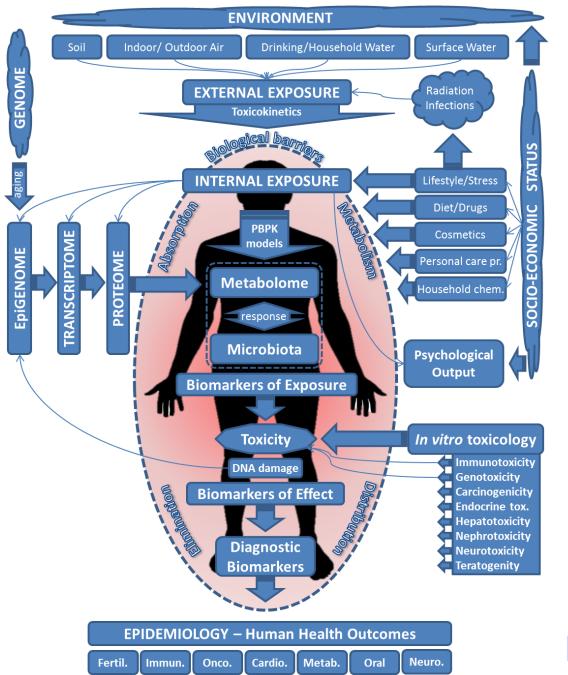
Assessment of harmfull effects

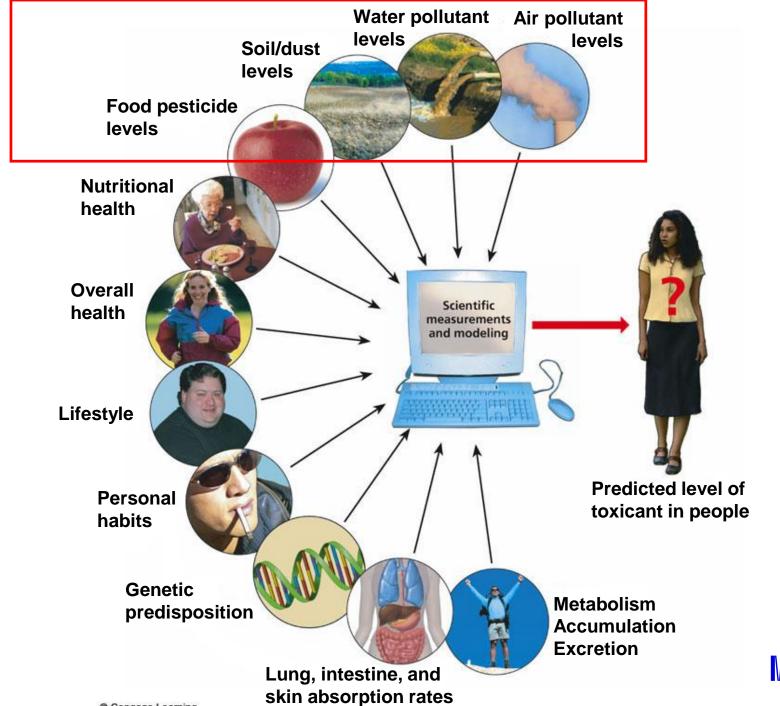
### **Bottom-up vs. Top-down Exposomics**



Rappaport SM. J Expo Sci Environ Epidemiol 21:5-9 (2011).







### **RECETOX** cohorts and cross-sectional studies





2012 2015 2019



















2035







**TOXIC COMPOUNDS IN** THE **ENVIRONMENT** 

TRACE ANALYTICAL **LABORATORIES** 

**BIOINFORMATICS** 

**HUMAN** BIOMONITORING **STUDIES** 

**BIOBANKS** 

**OMICS TECHNOLOGIES**  **DATABASES AND** INFORMATION **PORTALS** 

BIOSTATICTICS

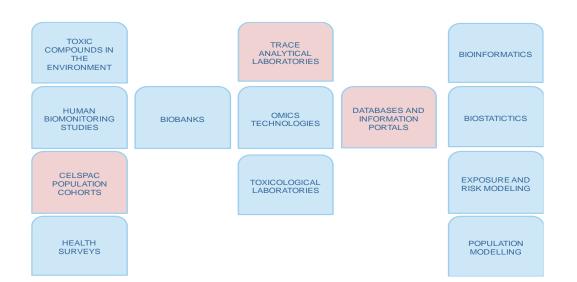
CELSPAC **POPULATION** COHORTS

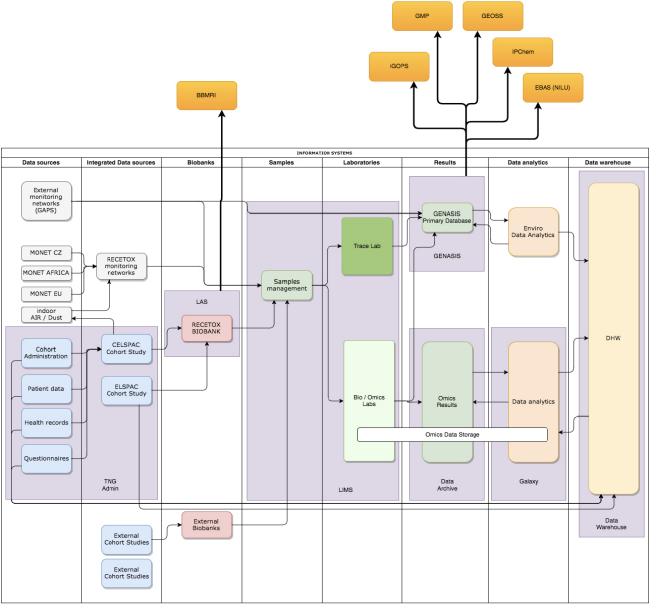
> HEALTH **SURVEYS**

TOXICOLOGICAL **LABORATORIES** 

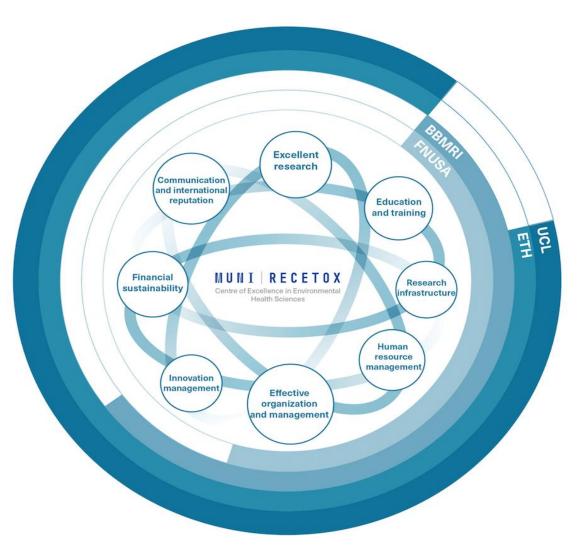
**EXPOSURE AND RISK MODELING** 

**POPULATION** MODELLING





### H2020 Teaming, Twinning, ERA Chair



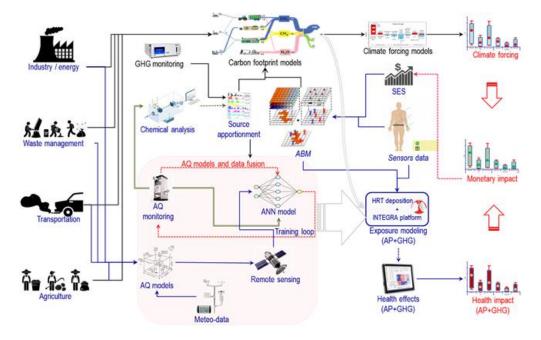
Five closely collaborating research programmes focus on:

- development of new (sampling, analytical, modelling) methods and technologies for assessment of <u>human exposures</u>,
- addressing causalities between <u>health impacts of toxic mixtures</u> and negative trends in public health,
- explaining <u>roles that other (social, economic, psychological)</u> <u>factors play</u> in development of chronique conditions,
- identification if new <u>biomarkers of susceptibility of the organism</u> and <u>biomarkers of early stages of development of selected</u> <u>diseases</u>,
- development of <u>bioinformatics tools for integrative data mining</u> and
- diagnostic kits for an early diagnostic of chronique diseases and disorders with a special attention to early development, metabolic, imunity, and reproduction disorders as well as neurodegenerative changes,
- development of new platforms for <u>labs on chips</u> applying methods of <u>artificial inteligence and machine learning</u> as well as
- new materials, signal molecules and molecular probes for biologican and medicinal applications.



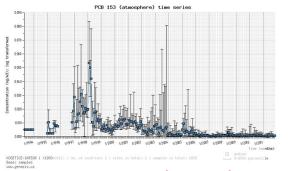
#### Science to policy and decision making

 Collaboration with <u>regional authorities</u>: smart and healthy cities, living labs



- Collaboration with <u>industry</u>: REACH, EIA, occupation exposure
- Private sector: new materials and technologies
- Health sector: analysis of data from health registers, preventive measures

National centre for toxic compounds is <u>an expert body of the</u> <u>minister of environment</u> providing a technical support for implementation of international conventions to protect human health from chemical exposures.





www.genasis.muni.cz

www.pops-gmp-org

Regional centre for capacity building and technology transfer in Central and Eastern Europe supports United Nations Environment Programme in building capacities for environmental research, implementation of international projects and monitoring programmes, building open-access databases and information portals.



## Thank you for your attention



Jana Klánová (klanova@recetox.muni.cz) www.recetox.muni.cz