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Toxicological Centre

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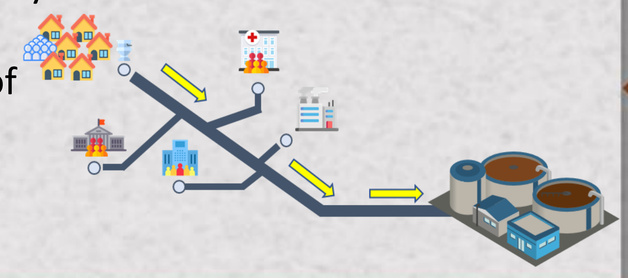
Wastewater-based Epidemiology

Wastewater as a mirror of the society

What?
- Analysis of spatio-temporal trends
- Investigating drug use at specific events
- Screening for new psychoactive substances (NPS)
- Investigating lifestyle (e.g. tobacco & alcohol use) and health aspects of communities

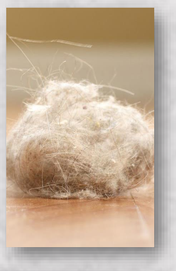
How?
- Wastewater = “pooled urine sample” of a large population
- Reflects disease, lifestyle and exposure
- European network of wastewater analysis



Environmental Contaminants

Human exposure and health impact for POPs, flame retardants, plasticizers, pesticides, and other emerging contaminants

What?
- Chemicals with endocrine disruptive properties and widespread exposure
- Applied in building materials, furniture, personal care products, food contact materials, …
- Via food, dust ingestion, air, dermal contact, …
- Chemical safety of edible insects



How?
- Characterization of human exposure pathways
- Characterization of pharmacokinetics
- Human biomonitoring studies
- Identification and evaluation of emerging contaminants
- Risk evaluation & assessment

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http://www.uantwerpen.be/en/rg/tox/

Forensic & Clinical Toxicology

Forensic analysis as a toxicological tool for justice, patients & physicians

What?
- Alcohol & drugs of abuse in traffic (oral fluid and blood)
- Post-mortem toxicological screening
- Therapeutic drug monitoring
- Monitoring adherence, abstinence & chronic abuse via hair and/or nail analysis
- Drug analysis in seizures

How?
- Biological samples: blood, urine, oral fluid, organs, vitreous humour, …
- Hair & nails
- Seized chemicals, powders, tablets, plant materials, …

In vitro metabolism & Metabolomics

Studying human metabolism using *in silico* and *in vitro* techniques

What?
- Prediction and elucidation of Phase I & II metabolites & metabolic pathways
- Characterization of alterations in endogenous metabolites (e.g. lipids)

How?
- Elucidation of metabolism of chemicals using human liver microsomes (HLM)
- Comparison of *in vitro* results with *in vi*vo samples
- Exposure of cell lines to external stressors
- Bioinformatic and statistical tools
- Characterization of affected biochemical pathways for biomarkers discovery

Techniques

Sample preparation
- Solid-phase extraction (SPE & µSPE)
- Liquid-liquid extraction (LLE)
- Soxhlet extraction

Analysis
- LCxLC-IM-QTOF-MS
- LC-QTOF-MS
- LC-MS/MS
- LC-DAD/FLU
- GC-MS and GC-MS/MS
- GCxGC-QTOF-MS
- Headspace-GC-FID