



Toxicological Centre

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Wastewater-based Epidemiology

An innovative way of estimating the use of drugs and other substances

What?

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

How?

- Wastewater = 'pooled urine sample' of a large population
- European network of wastewater analysis (SCORE)

Environmental Contaminants

Human exposure and impact on health for bisphenols, plasticizers and flame retardants

What?

- Chemicals with endocrine disrupting properties and widespread exposure
- Applied in building materials, furniture, personal care products
- Via food, dermal contact, air, dust, ...

How?

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

More info / questions:

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Forensic & Clinical Toxicology

Toxicological analysis as a tool for justice, patient & physician

What?

- Alcohol & drugs of abuse in traffic
- Post-mortem toxicological screening
- Therapeutic drug monitoring
- Monitoring adherence, abstinence & chronic abuse
- Drug analysis

How?

- Biological samples: blood, urine, oral fluid, organs, vitreous humour, ...
- Hair & nails
- Seized chemicals, powders, tablets, plant material, ...

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 cellular metabolites

How?

- Elucidation of metabolism of chemicals using human liver microsomes (HLM)
- Comparison of *in vitro* results with *in vivo* samples
- Exposure of human cells to external stressors
- Bioinformatic and statistical tools
- Characterization of affected biochemical pathways

Techniques

Sample preparation

- Solid-phase extraction (SPE)
- Liquid-liquid extraction (LLE)
- Soxhlet extraction

Analysis

- LCxLC-IM-QTOF-MS
- LC-QTOF-MS & LC-MS/MS
- LC-DAD/FLU
- GC-MS/MS & GC-MS
- Headspace-GC-FID