

The innovative wastewater-based epidemiology approach with the advances of high resolution mass spectrometry as a complementary biomonitoring tool for assessing the health status of a population

Researcher: Nikolaos Rousis
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Marie Curie MSCA-IF-GF, 896141

International Collaboration (partners)

Periods (months): 1-24 Australia (Prof. K.V. Thomas)
25-36 Greece (Prof. N.S. Thomaidis)



HELLENIC REPUBLIC

National and Kapodistrian
University of Athens



THE UNIVERSITY
OF QUEENSLAND

A U S T R A L I A

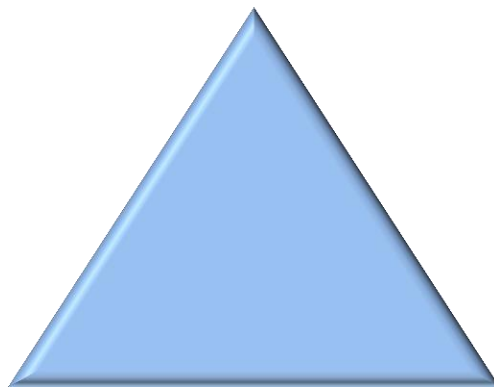
CREATE CHANGE



The **AIM** of the **NTS-EXPOSURE** project is to develop a novel methodology in order to assess the health status of a population in specific areas

The unique characteristics of **High Resolution Mass Spectrometry** combined with the potential of the innovative **Wastewater-Based Epidemiology** approach can give us the capability to provide valuable **information for public health**

Analytical Chemistry



Epidemiology

Risk Assessment

- Development of LC and GC HRMS methods
- Development of sample preparation procedure
- Sampling (Australia and Greece)
- Data mining
- Validation of new WBE biomarkers
- Risk assessment

High Resolution Mass Spectrometry methodology

Use of complementary non-target screening analytical methods (LC and GC based on HRMS)
→ new biomarkers
→ monitoring indicators of public health

Wide-scope screening of a large variety of compounds, metabolites and transformation products

Acquisition of accurate-mass full-spectrum data

Target HRMS

Suspect screening

Non-target screening

Retrospective analysis

Sampling

Influent Wastewater

24-hour composite samples

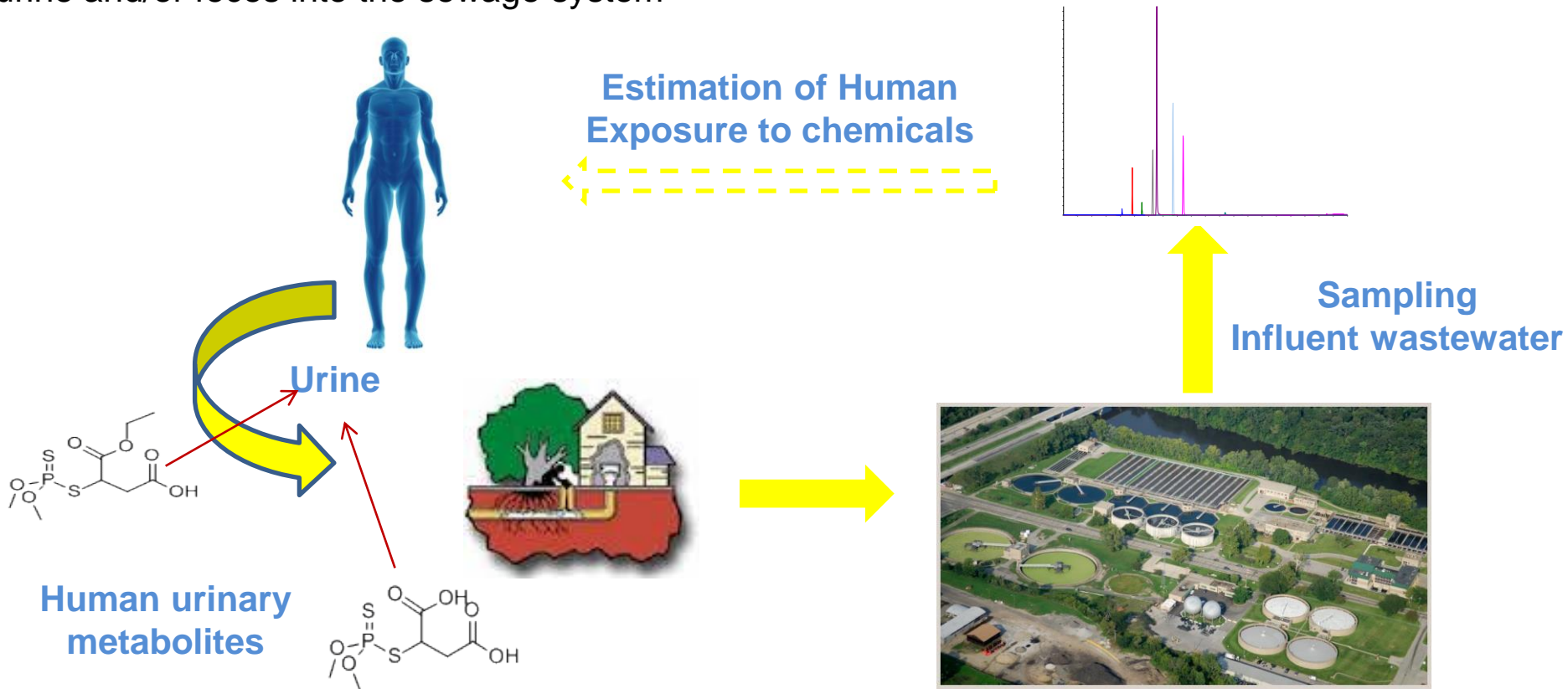
7 consecutive days

Different seasons of the year



Wastewater-Based Epidemiology approach

Principle: Everything entering the human body is metabolized and subsequently excreted with the urine and/or feces into the sewage system



Wastewater-Based Epidemiology approach

Wastewater-based epidemiology is an **alternative** to Human Bio Monitoring and **innovative** approach for the retrieval of **epidemiological information** from wastewater through the analysis of specific human **metabolic excretion products**



Collective urine test

- objective and real time information (reduced complexity)
- rapid identification of any increase or/and decrease of particular substances within a surveyed area
- evaluation of the effectiveness of preventive programs before, during and after the intervention
- very low ethical risks



Wastewater can hold a wealth of data on chemical consumption and exposure of whole communities

It can be a solid tool to monitor the human health status in Europe and Australia