

# VIEWPOINT WATER BIOMONITORING

## Micropollutants under video-surveillance



**ViewPoint**  
Water biomonitoring

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# OUR ENVIRONMENTAL SOLUTIONS

ToxMate™



**ViewPoint**   
Water biomonitoring

## MULTI-SPECIES BIOMONITORING STATION

### Solution based on the analysis of the behavior of aquatic organisms

ToxMate analyzes **48 test organisms, from 3 species of macro-invertebrates**, representative of ecosystems in Europe.

By observing and continuously analyzing their movements, ToxMate **detects in 2 minutes the presence of harmful substances** through the identification of abnormal behavior indicating the presence of **micropollutants or cocktail effects**.



Gammare



Sangsue



Radix

### Continuous monitoring in real time

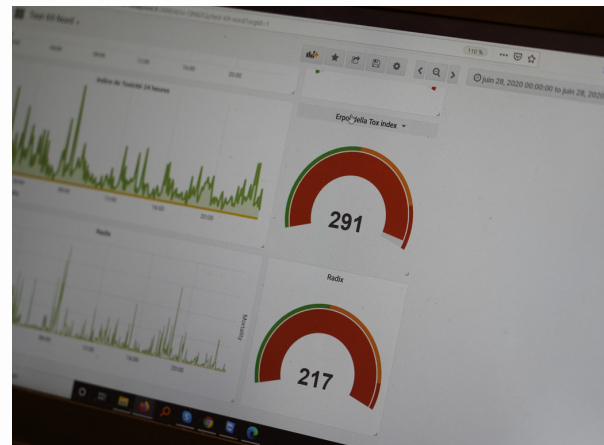
Monitoring is provided on site, in real time, **24 hours a day**. It is adjustable to the desired detection thresholds and allows a **better management of the station** thanks to the identification of recurrent pollution episodes.

### Instant alerts

Alerts are triggered **immediately, via email or smartphone**, when organisms react to a toxic effect of the water. At the same time, ViewPoint's monitoring teams contact the site manager.

### Simplicity and reliability

The user has **no intervention or manipulation** to do on the equipment. No special skills are required. Installation and maintenance are performed entirely by ViewPoint..





# ToxMate™

Let us preserve the environment !

Use aquatic organisms to detect instantly and 24/7 any micropollutants in your water

✉ info@toxmate.fr 🌐 www.toxmate.fr ☎ + 33 (0) 4 72 17 91 92



ToxMate is the result of a close collaboration between ViewPoint and INRAE within the AXELERA competitiveness cluster.

Two joint patents have been filed for its design.

Deployable in urban and industrial wastewater treatment plants and in drinking water treatment plants, ToxMate continuously analyzes water quality and alerts in real time in case of detection of micropollutants.

ToxMate is the only biomonitoring station that instantly analyzes the behavior of 3 species of aquatic invertebrates simultaneously.

The ToxMate project has obtained the support of the European Commission for its industrialization and marketing within the framework of the H2020 SME Instrument program.

Tested and proven on different urban and industrial WWTPs, ToxMate has demonstrated its reliability and relevance as an early warning and monitoring tool for water managers.

[Our video to present Toxmate](#)

<https://www.youtube.com/watch?v=tfJspZ-Zxdo>

## Our Partners



This project has received fundings from the European Union's research and innovation programme under agreement No 881495

## The Environmental Context

Micropollutants in water are a growing concern.

A micropollutant is a **synthetic or natural substance**, characterized by **significant toxicological effects** even at very low concentrations in the environment (the equivalent of a sugar cube in an Olympic swimming pool!).

These substances are generally **persistent**, i.e. non-biodegradable and accumulate in the food chain up to humans.

From industrial, agricultural, urban or natural origin, micropollutants are found in natural environments such as rivers, lakes and groundwater, from which a large part of our drinking water comes

**More than 200,000 molecules** belong to the different families of micropollutants, without taking into account the recombinations or interactions of molecules (cocktail effects) which can also cause harmful effects on the environment and health.

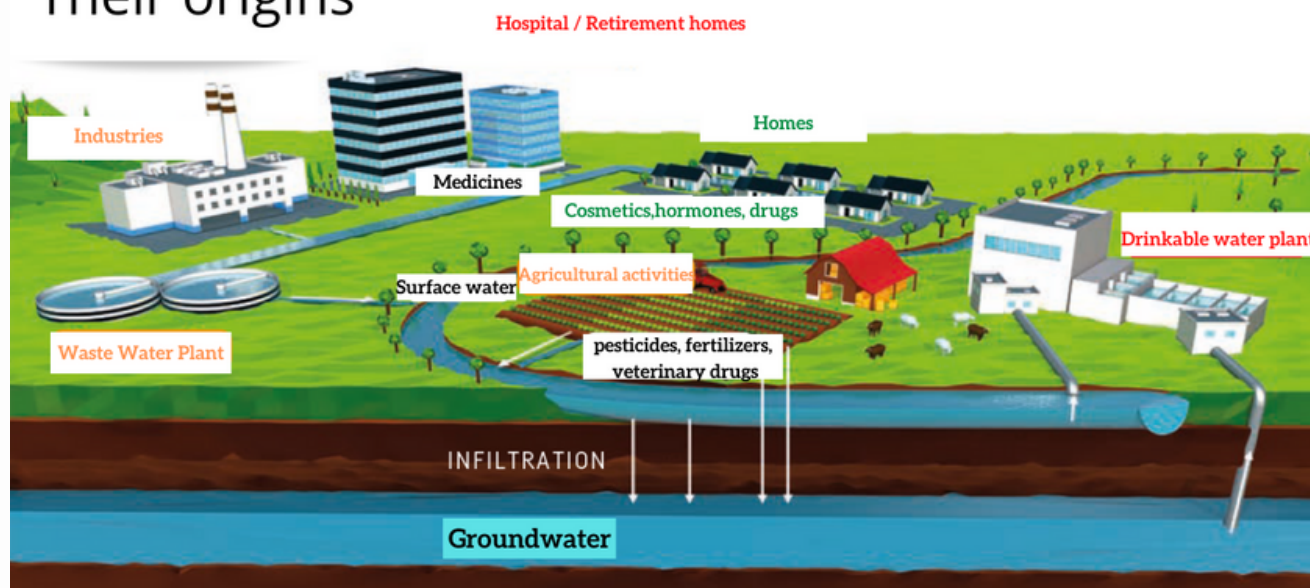
It is therefore **impossible, using the classic physico-chemical analysis procedures** used for water quality control, **to identify the possible presence of all these molecules**, and even less to measure their cocktail effects. The costs and delays would be prohibitive.

**However, the health and environmental stakes are high.**

In a context of climate change and reduction of the resource, the preservation of water quality becomes fundamental.

**In this context, research conducted by ViewPoint and INRAE Lyon since 2014, has highlighted the contribution of advanced solutions, based on biomonitoring, to meet the challenges of detecting micropollutants.**

## Their origins



Source: Synteau/Inrae study: the consequences of micropollutants discharged into wastewater - June 2020

## APPLICATIONS



### Urban Waste Water Plants

- Upstream
- After treatment, before discharge into the natural environment, to detect the risk of toxicity.
- Upstream and/or downstream of a tertiary treatment system to evaluate its performance



### Industrial Waste Water Plants

- at the exit of the step, before discharge into the environment, to detect the risk of toxicity
- ToxMate is implemented on industrial sites belonging to different sectors of activity: food, textile, dyeing, surface treatment and chemistry

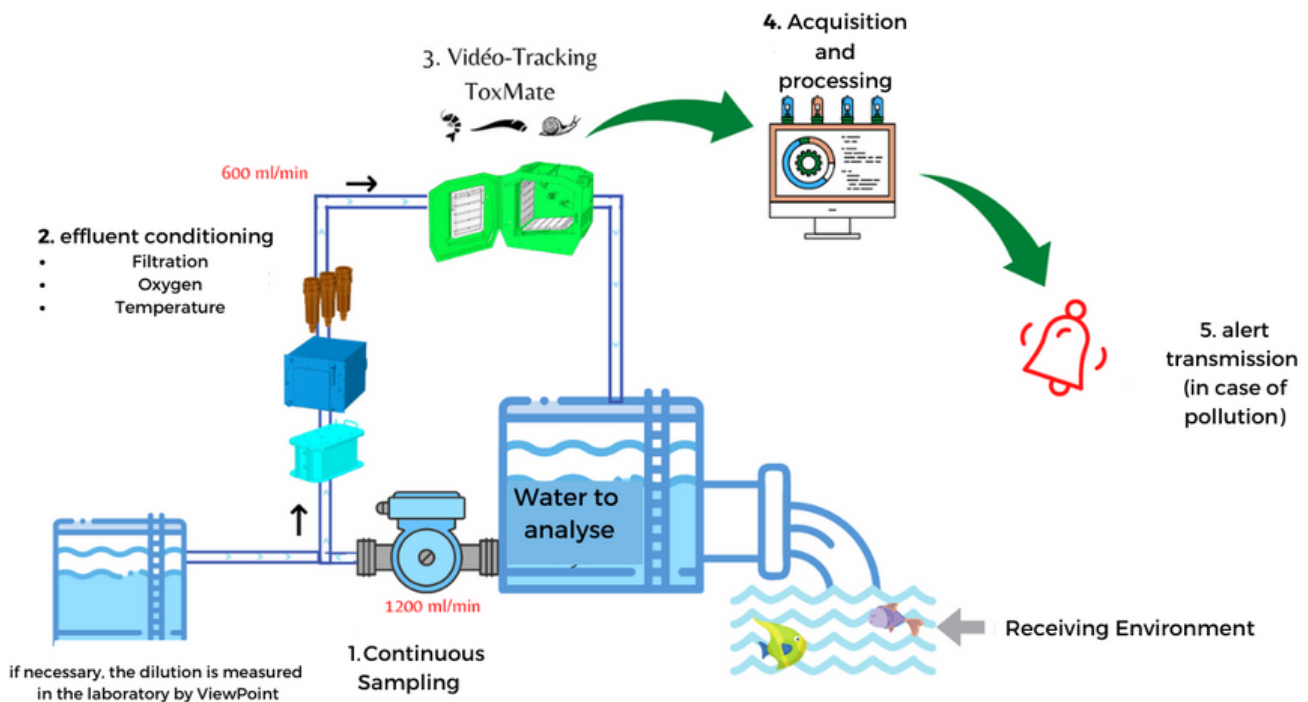


### Drinkable Water Plants

- Upstream, to monitor water taken from the river before treatment
- Downstream of different treatment steps, to evaluate the performance

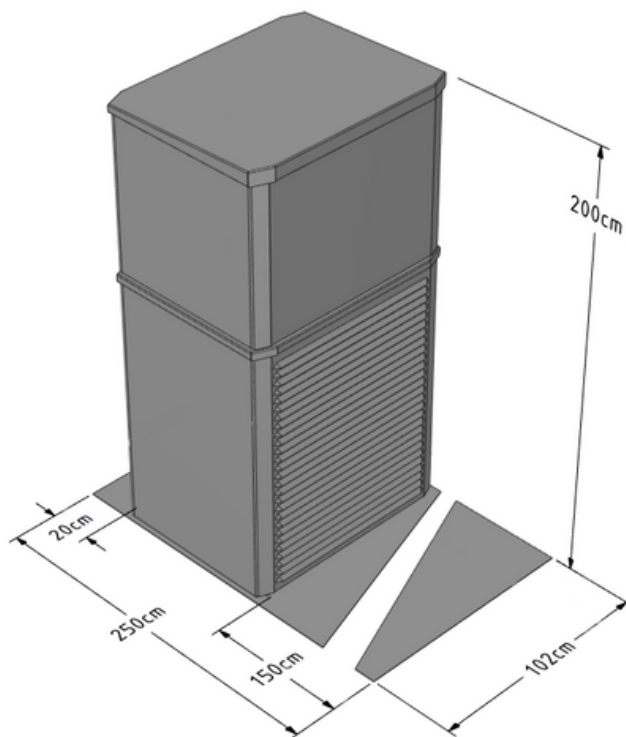
## OPERATION

Implanted on site, ToxMate continuously analyzes, by video-tracking, the individual behavior of 3 species of invertebrates. The data collected is processed and interpreted. An alert is triggered in case of micropollutants or cocktail effects.





## TECHNICAL CHARACTERISTICS



### PLACE

Inside, at 20 cm from a wall.  
Leave 2 m of space in front



### WEIGHT

120 kg



### POWER SUPPLY

2\*2P+T 220 V - 16A - IP55



### COMMUNICATION

3 / 4 G / Internet



### VIDEO-SURVEILLANCE

3 systèmes de traitement  
d'images



### SAMPLING

200-400 L.h-1  
On industrial sites, requires  
drilling water



### BIO-INDICATORS

16 individuals of each of the three  
aquatic invertebrate species  
(Gammarus fossarum, Erpobdella  
testacea and Radix auricularia)



### TREATED WATER OUTLET

Gravity drain at 40 cm height

# ToxMate™

## QUELQUES RÉFÉRENCES



CHARTRES  
MÉTROPOLE

GRAND LYON  
la métropole



Ville de LAON



joannais  
AGGLOMÉRATION



VERSAILLES



Fécamp  
Caux Littoral Agglo



nevers  
AGGLOMÉRATION



GRAND  
REIMS  
COMMUNAUTÉ URBAINE



SIAAP  
Service public de l'assainissement francilien



Ville de  
LUNÉVILLE



EPERNAY  
AGGLO CHAMPAGNE



Loire  
FOREZ  
Agglo

## OUR CUSTOMERS TALK ABOUT TOXMATE

"When the Toxmate station is placed at the inlet of the plant, we can see the micropollutants coming in. It doesn't detect them at the outlet of the plant. This shows our performance in capturing and treating them.

David Verhille, Director of the Central Burgundy territory at Véolia Nevers-les-Saulaies WWTP

Extract from the Journal du Centre - 13 June 2022

"The subject of water quality is of major importance in our time. The treatment of wastewater must be irreproachable, in order to respect biodiversity and the quality of the water in the Eure. The Toxmate tool provides us with additional security and accompanies the Mare Corbonne wastewater treatment plant staff on a daily basis.

Alain Bellamy, Vice-President of Chartres Métropole in charge of Drinking Water and Sanitation

# ToxMate™



teintures &  
impressions  
de lyon

"ToxMate helped us to obtain our pumping authorisation, as a derogation, since we ensure the good quality of our discharge water, which represents 70% of the volume, before returning to the natural environment.

Jean-Michel Bertrand  
CEO Teintures et Impressions de Lyon



ToxMate is supported by the water agencies and the OFB



Établissement public du ministère  
chargé du développement durable





# EDITO

Committed for more than 30 years to the design of equipments dedicated to behavioral studies for medical and agronomic research, we are proud today to deploy our know-how for the preservation of the environment.

Our collaborations with research centers, in particular INRAE (french National Institute for Research in Agronomy and Environment), have allowed ViewPoint to foresee concrete applications of our tools initially dedicated to researchers.

Beyond our historical business, this is a real turning point that we have undertaken to address today to water managers.

This diversification is based on our technological and computer expertise in the study of animal behavior, complemented and enriched by the research conducted by INRAE in terms of biomonitoring. The result of these joint skills is ToxMate, the first multi-species biomonitoring station for water quality, which continuously analyzes water and alerts water treatment plant managers in real time in case of detection of micropollutants.

**Didier NEUZERET**  
**CEO ViewPoint**



Didier Neuzeret is an engineer specialized in image processing and trained in management. He took over the management of ViewPoint in 1990. Very early on, he became aware of the planet's health and environmental problems and used his skills to create solutions to meet these major challenges.

His objective: to design products and materials to support research in the fields of health, food and the environment, for a better future

# WHO ARE WE ?



Since 1990, ViewPoint, a French company, has been involved in medical and environmental research.

ViewPoint is one of the world's leading providers of automated animal behavior monitoring and analysis.

Our solutions enable researchers and users to study a wide range of subjects, from neuroscience to ecotoxicology and pharmacology.

Prestigious research centers, both public and private, trust us throughout the world.

Based on its recognized expertise and collaborations with research institutions, ViewPoint has been involved for several years in the deployment of innovative solutions dedicated to water quality and sludge ecotoxicity monitoring, in order to protect the natural environment and health.

## OUR LOCATIONS

### HEAD OFFICE

**Production and marketing Europe**

Civrieux (01)  
21 employees

### Commercial offices ASIA

Shanghai (Chine)  
3 employees

### North and South America

Montréal (Canada)  
2 employees

# OUR EXPERTISE

## From medical research to pollutant detection ... the deployment of a know-how

Since 1990, ViewPoint has been developing expertise in the creation of behavioral analysis tools.

As a developer of high-tech software and hardware, ViewPoint's expertise is applied to the medical research and environmental sectors.



### MEDICAL RESEARCH

ViewPoint is recognized as a leading provider of animal behavior analysis solutions for medical research worldwide.

Its video-tracking tools and image processing software are among the most reliable and efficient on the market and are used in leading laboratories and universities worldwide.

Used in various specialties, they contribute in particular to research in the fields of neuroscience research and the study of diseases such as Parkinson's and autism, as well as in drugs/toxic substances screening for ecotoxicology research.

ViewPoint pioneered the analysis of zebrafish behavior in 2001 with the development of the Zebrabox in collaboration with Harvard University.



### PLANT PHENOTYPING

ViewPoint's expertise was then applied to the development of plant phenotyping solutions. This solution allows the continuous measurement of plant growth and development to select the most suitable species for specific environmental conditions.

This phenotyping assessment is often complex as it requires a lot of quantitative data. ViewPoint's expertise has enabled the design of solutions that offer both highly accurate control of environmental parameters and their variations, and automation of phenotypic trait measurements.



### WATER QUALITY

In 2013, Viewpoint, in collaboration with INRAE (National Institute for Research in Agronomy and Environment) in Lyon, shows interest in the behavioral response of aquatic invertebrates to the presence of micropollutants in water. Within the framework of the SMILE project (FUI) in partnership with several companies, the AXELERA cluster and the Rhône-Alpes Region, ViewPoint starts working on the development of ToxMate. The biomonitoring station ToxMate, deployable in urban or industrial wastewater treatment plants and drinking water treatment plants enables the continuous detection of micropollutants in real time.



# OUR REASON FOR BEING

**To work for the well-being of people and the planet,  
in a spirit of benevolence and commitment**



## OUR VALUES

### **HONESTY**

Respect our reason of being and our values.

### **COMMITMENT**

Motivate, set an example, don't take the easy way out

### **BENEVOLENCE**

Show mutual aid, solidarity and tolerance

### **PLEASURE**

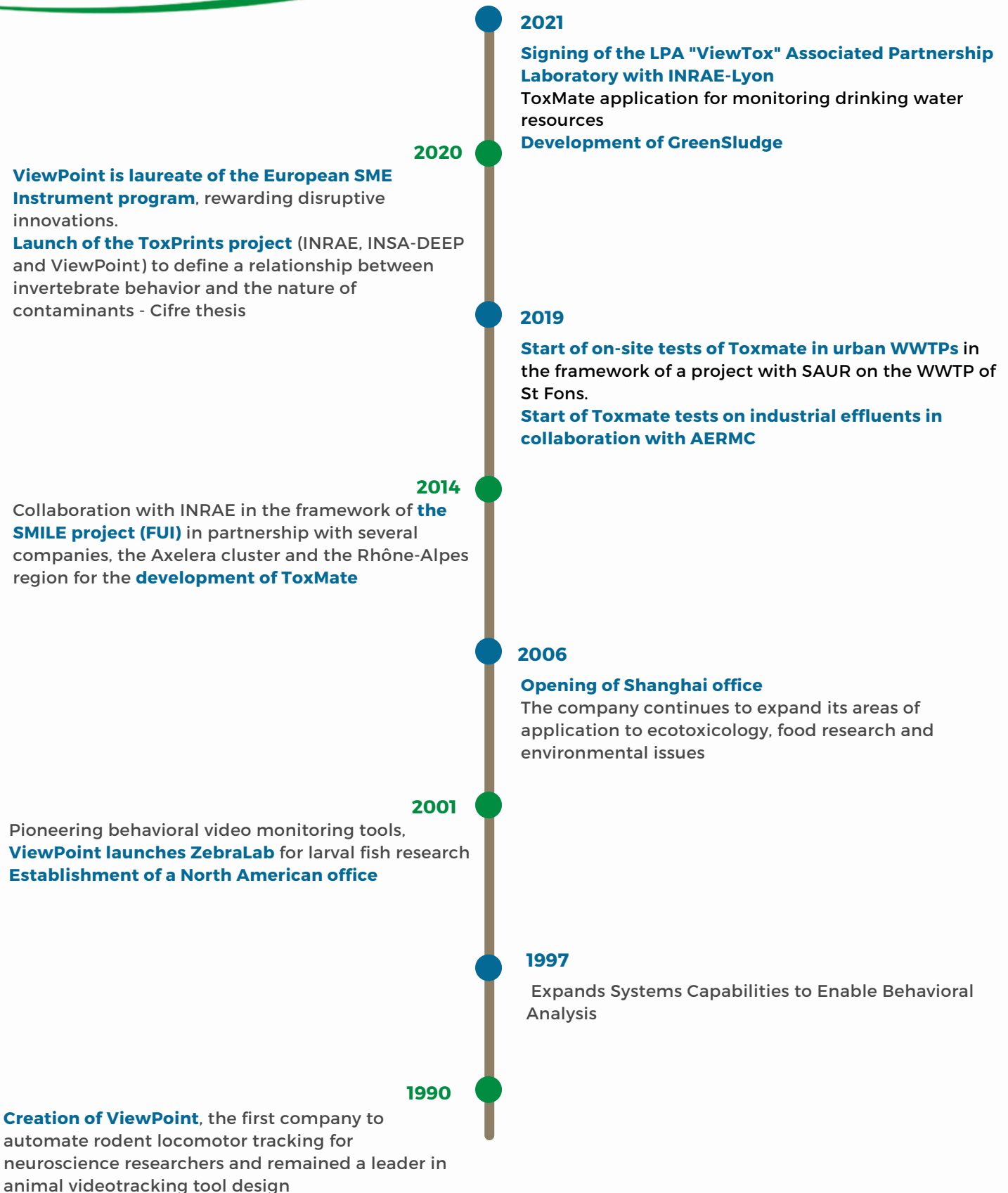
Working in a friendly and pleasant atmosphere, developing interest in work

Our environmental commitment is reflected in both :

- in the search for solutions to safeguard the quality of a fundamental resource : water
- in the design of environmentally friendly devices, based on biomonitoring



# OUR HISTORY



## CONTACTS



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<https://www.linkedin.com/company/viewpoint-water-biomonitoring>

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