

## Who is implementing CytoThreat project?

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## Pharma cluster:

**CytoThreat** works in close collaboration with the project **Pharmas** (Ecological and human health risk assessments of antibiotics and anti-cancer drugs found in the environment), coordinated by Brunel University in Great Britain (coordinator prof. John Sumpter). The complementarities of the two projects addressing the same problem will result in more and better information, and we will be able to include more European areas into the studies. Exchange of the results of the complementary approaches will produce more accurate risk assessments.



# CytoThreat

Fate and effects of cytostatic pharmaceuticals in the environment and identification of biomarkers for an improved risk assessment on environmental exposure.

A Collaborative Project within the 7th Framework Programme ENV.2010, Theme: Human health and environmental effects of exposure to pharmaceuticals released in the environment.



[www.cytothreat.eu](http://www.cytothreat.eu)

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## What is CytoThreat?

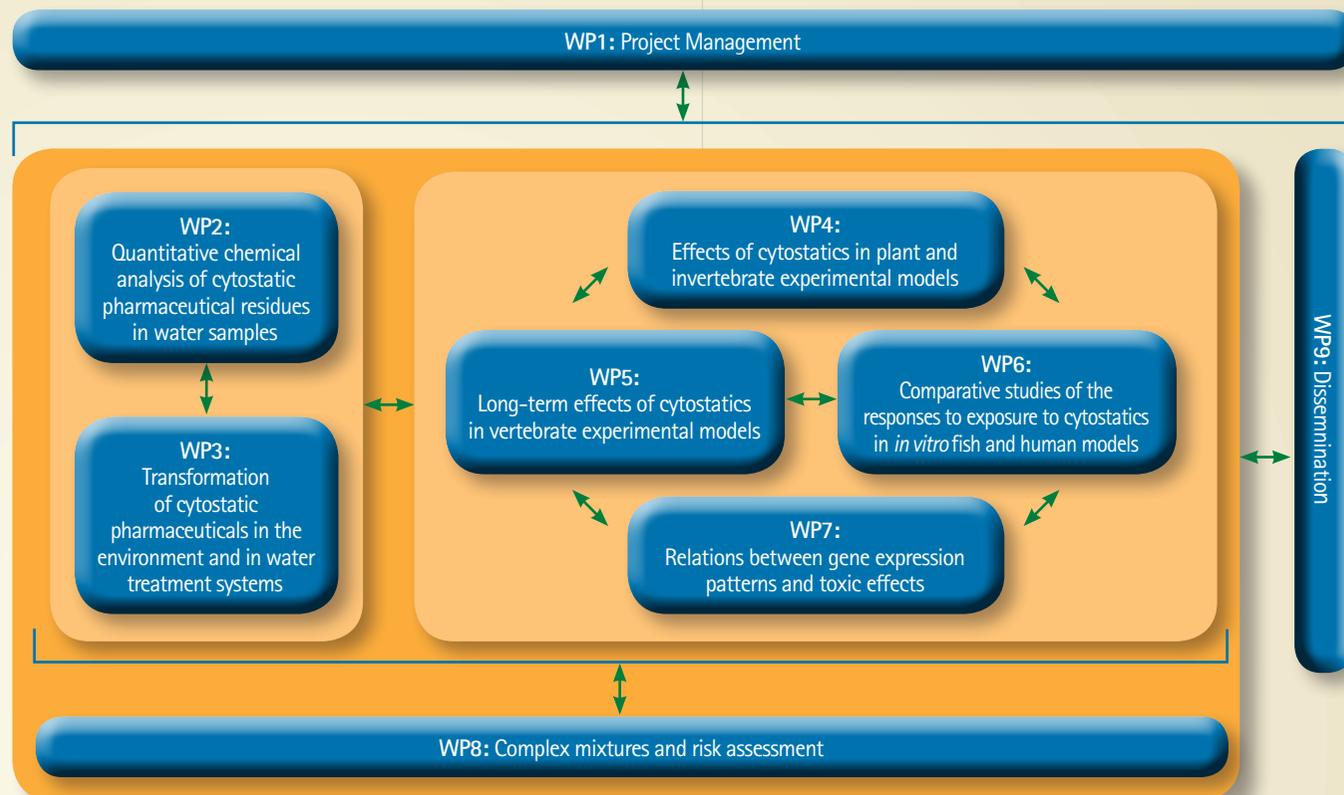
CytoThreat is an EC-FP7 funded project focused on evaluating environmental and human health risks posed by release of cytostatic pharmaceuticals into the environment.

## Why study residues of cytostatic pharmaceuticals in the environment?

Unlike other pharmaceuticals, the occurrence and distribution of cytostatics in the environment has not been studied systematically, since they are used in much smaller quantities. Consequently, not much research has been directed into the development of the ultra-sensitive analytical methods required to enable their detection and determination. Their effects on humans are thoroughly investigated during preclinical and clinical studies, as required for marketing authorization permits, but data on their potential effects on non-target organisms and studies that would allow prediction of their long term and delayed effects due to chronic exposure through environmental contamination are lacking. The presence of cytostatic residues in the environment could lead to systemic environmental effects that, in the worst case, result in extinction of susceptible organisms, while in exposed humans increased cancer incidence and reproductive defects could occur. Thus, data are needed for reliable assessment of the potential risks and introduction of the appropriate risk management.

## What are the main aims of CytoThreat?

- To assess the occurrence and fate of cytostatic pharmaceuticals, their metabolites and transformation products in wastewater treatment systems and in the environment.
- To identify potential delayed and irreversible effects of cytostatic pharmaceuticals in aquatic experimental models at environmentally relevant concentrations, and to compare the results with those obtained in experimental models with cells of human origin.
- To explore the combined effects of mixtures of cytostatic pharmaceuticals, their excreted metabolites and transformation products in the environment or in wastewater treatment systems and in real environmental samples.



- To develop, based on the results of the above, guidance on how to improve the environmental and human risk assessment of cytostatics released into the environment.

## How will we implement the goals?

Advanced analytical technologies will be applied and new methods developed to analyze the presence and distribution of selected cytostatics and their degradation products in ecosystems. Concurrently, a whole range of toxicological tests will be applied, including identification of early biomarkers for long term effects based on state of the art toxicogenomic approaches and bioinformatics. In this way the project will gain the ability to provide early diagnostic tools for predicting potential long term effects on ecosystems and on human health. The resulting accurate estimates of environmental concentrations of cytostatic pharmaceuticals coupled with toxicological data, constitute the key parameters required for improved risk assessment procedures.

## What will be the impact of CytoThreat?

As pharmaceutical residues are currently a very "hot" scientific topic, CytoThreat will promote the dissemination of new scientific findings, together with associated risk issues, to European citizens and other stakeholders including policy makers, industry and non-governmental organisations.

With its emphasis on environmental and health risks associated with the release of cytostatic pharmaceuticals, CytoThreat will provide new perspectives on environmental and health protection. The project's results will provide the basis for new policy measures and more effective regulations. The CytoThreat project contributes directly to EU policies and strategies related to human health and environmental protection, with the aim of achieving a quality of environment in which the levels of man-made contaminants give no rise to significant risks for human health.