

## ENVIRONMENTAL ASSESSMENT OF PHARMACEUTICAL AND PERSONAL CARE PRODUCTS (PPCP`s) IN WASTEWATER

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Pharmaceuticals and Personal Care Products (PPCP`s) are extensively and increasingly being used in human and veterinary medicine. Some of them have been identified as an emerging class of potential pollutants for the aquatic environment. A widely literature published recognized as one of the emerging issues in the different areas of environmental study.

Despite these efforts, the adverse effects of many PPCP`s and its metabolites are still unknown. Some authors have been studied in detail their harmful property: Endocrine disruptions, persistence, toxicity or bioaccumulation with many troubles and questions to elucidate. Hereby, this project considers some of these compounds, a few of them of recent synthesis or with increased prescription, consumption and presence in aquatic environment.

In Europe, increasingly restrictive regulations take into account the problem of release of substances and especially in relation to organic chemicals in the environment. There is a discrepancy between the number of compounds potentially present in the environment and the number of regularly monitored priority pollutants. Therefore, it`s necessary to generate tools as a supplement to experimental data in weight of evidence approaches, for predicting the environmental and toxicological properties of PPCP`s, in the interests of time and cost effectiveness and animal welfare.

Besides, these environmental and toxicological properties can be correlated with experimental data, such as toxicity evaluation with *Vibrio Fischeri* (Figure 1), *Daphnia magna* and fish as endpoints. This information can be transformed in categories of environmental impact.

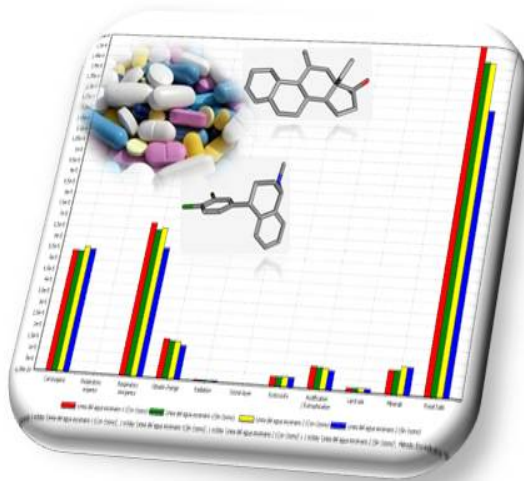


**Figure 1.** Toxicity biological test analyzer.

The damage categories for ecosystem quality and human health can be expressed in life cycle impact assessment (LCIA) as: Potentially Affected Fraction of species (PAF) in relation to the concentration of toxic substances and Disability Adjusted Life Years (DALYs) for carcinogenicity. There is a large variation concerning the number of inventory data contained in

different methods for life cycle assessment but in all of them is evident the scarce information of PPCP's adverse effects.

The aim of this project is to evaluate the environmental action of Pharmaceutical and Personal Care Products (PPCP's) in wastewater by impact indexes incorporated in the life cycle assessment (LCA). This goal will be addressed by:



- Estimation of the environmental impact by (Quantitative) Structure-Activity Relationships (QSAR's).
- Determination of the ecotoxicological effect by respirometric and bioluminescence techniques.
- Correlation between ecotoxicological levels and standardized index of environmental impact.
- Evaluate the impact of PPCP's in different wastewater treatments with Life Cycle Assessment (LCA).