# Poster Presentation

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*Structural and functional profiling of estrogen receptors environmental ligands*

V. Delfosse[1], M. Grimaldi[2], J. Pons[1], V. Cavaillès[2], G. Labesse[1], P. Balaguer[2], W. Bourguet[1]

[1]*Centre de Biochimie Structurale, Montpellier, France,* [2]*Institut de Recherche en Cancérologie de Montpellier, Montpellier, France*

Endocrine-disrupting chemicals (EDCs) are exogenous substances that interfere with the function of hormonal systems and cause deleterious effects on humans and wildlife. Many EDCs are man-made chemicals produced by industry and released into the environment. Some naturally occurring EDCs can also be found in plants or fungi. Epidemiological studies suggest a link between the exposure to these chemicals and the development of diseases like cancers, reproduction defects, or metabolic disorders. Endocrine disruption has raised considerable concern in recent years so that several countries have developed risk assessment programs aimed at evaluating the toxic potential of more than 100,000 chemicals. In this context, we have been using a battery of structural, biophysical and cell-based approaches to investigate the mechanisms by which a variety of environmental pollutants, including bisphenols [1], pesticides, phthalates, benzophenones, parabens, myco- and phytoestrogens or alkylphenols, bind to and modulate the activity of the estrogen receptors ERα and ERβ, two nuclear hormone receptors (NRs) that are primary targets of environmental contaminants. Crystallographic analysis reveals that these structurally and chemically diverse compounds bind to ERs via diverse sets of protein–ligand interactions reflecting their differential activities, binding affinities and specificities. A detailed analysis of the various binding/activation mechanisms will be presented. Based on these structural data, we are developing a protocol for in silico evaluation of the interaction between pollutants and ERs or other members of the NR family. The server which utilises crystal structures to model any NR/xenobiotics complexes and estimate binding affinities will also be presented. Overall, this study provides a wealth of tools and information that could be used for the development of safer chemicals devoid of NR-mediated activity and more generally for environmental risk assessment.

*[1] V. Delfosse, M. Grimaldi,  J.-L. Pons, et al. PNAS U S A. 2012 11;109(37):14930-5.*

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