



**23**  
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## SÉMINAIRE

# Simplifying biology. Process-based models for toxicant effects and how to apply them.

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Living organisms are complex systems, and stressing them with toxicants only increases the complexity. In ecotoxicology, the common strategy for addressing toxic effects is to accept this complexity and provide descriptions of parts of the response of the system. Such descriptions will not advance our understanding and cannot address the problems of environmental risk assessment. Complexity is of course not unique for ecotoxicology. In related disciplines such as environmental chemistry, the common approach is to simplify the system to its bare essence and study the behaviour of the simplification. Something similar does exist for toxic effects, which can be placed under the designation "toxicokinetic-toxicodynamic" (TKTD) modelling. Toxicokinetics deals with the uptake of chemicals into the organism, whereas toxicodynamics addresses the relationship between internal concentrations and effects over time. In this presentation, I will focus on toxicodynamic models, and discuss how biology can be radically simplified to suit our purpose. Furthermore, I demonstrate how experimental data can be analysed, and discuss the statistical problems associated with fitting the models to data.