

The EPA ToxCast Program

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There are tens of thousands of chemicals used in the environment for which little or no toxicology information is known. Current testing paradigms that use large numbers of animals to perform in vivo toxicology are too slow and expensive to apply to this large number of chemicals. An alternative approach is to use high throughput in vitro methods to analyze the behavior of many environmental chemicals in a rapid and cost-effective manner. The outcome of such experiments will include mechanistic information on chemicals that can be used to infer potential modes of toxicity. This information can then be used to prioritize a selected set of chemicals for further, more detailed testing. The EPA ToxCast program is a large-scale effort to test this approach. We are generating data for over 400 HTS and HCS assays plus genomics microarrays, all applied to 320 chemicals, most of which are pesticide active ingredients. For this same set of chemicals, we have detailed, guideline study in vivo toxicology data. By combining these two data sets, we hope to develop in vitro signatures of in vivo toxicity that can be used in a predictive fashion on large numbers of environmental chemicals. This presentation will review the design of the ToxCast Phase I experiment and will present preliminary results. *[This work has been reviewed by EPA and approved for publication but does not necessarily reflect official Agency policy].*