Overview of the ToxCast^{TM} Research Program: Applications to Predictive Toxicology and Chemical Prioritization

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EPA's ToxCast program, the NTP's HTS initiative, and the NCGC's Molecular Libraries Initiative into a collaborative research program focused on identifying toxicity pathways and developing in vitro assays to characterize the ability of chemicals to perturb those pathways. The goal is to develop new paradigm for high throughput toxicity testing that collects mechanistic and quantitative data from in vitro assays measuring chemical modulation of biological processes involved in the progression to toxicity. As toxicity pathways are identified, the in vitro assays can be optimized for comparison to in vivo animal studies, and for predicting effects in humans. Subsequent computational modeling of toxicity pathway responses and appropriate chemical dosimetry will need to be developed to make these predictions relevant for human health risk assessment. *This work was reviewed by EPA and approved for publication but does not necessarily reflect official Agency policy.*