AN INTELLIGENT REPRODUCTIVE AND DEVELOPMENTAL TESTING PARADIGM FOR THE 21ST CENTURY

Dix, David J.[1]; Knudsen, Thomas B.[1]

[1]NCCT, ORD, US EPA, Research Triangle Park, NC

Addressing the chemical evaluation bottleneck that currently exists can only be achieved through progressive changes to the current testing paradigm. The primary resources for addressing these issues lie in computational toxicology, a field enriched by recent advances in computer science, bio- and chem-informatics, molecular biology, and high-throughput screening (HTS). In vivo testing is resource intensive, particularly for multigenerational reproductive and prenatal developmental assessment. Furthermore, predicting adverse effects of chemicals for reproductive and developmental outcomes has been confounded by the lack of quantitative models that address the complex molecular and physiological factors underlying reproductive decrements and developmental malformations, and the life-stage and generational sensitivities involved. There is currently a strong focus on identifying endocrine disrupting chemicals through a battery of in vitro and in vivo screening tests. However, the shared complexities and challenges of modeling reproductive, endocrine and developmental toxicity, and the parallel need for higher throughput evaluation, creates the need for an integrated application of predictive models for chemical prioritization and targeted testing. Ultimately, predictive models of reproductive, endocrine, and developmental toxicity will provide a critical component in the computational toxicology toolbox that better informs regulatory testing decisions.
This abstract does not represent EPA policy.