

DNTP Developmental Neurotoxicity Health Effect Innovation (DNT HEI)

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Globally, there is an increase in the prevalence of neurodevelopmental disorders such as autism spectrum disorder, attention deficit hyperactivity disorder, dyslexia and other cognitive impairments. The aim of the Developmental Neurotoxicity Health Effect Innovation (DNT-HEI) is to have global public health impact by identifying environmental chemicals that have the greatest potential to affect susceptible populations (developing embryo/fetus, infants, children) and thereby prevent neurodevelopmental disorders.

Currently, DNT guideline studies are conducted when there is an a priori trigger or if a compound is a suspected or known developmental neurotoxicant. As a result, chemicals with unknown potential to cause DNT remain untested. Even in cases with in vivo DNT data, there are uncertainties in the current DNT test guidelines when extrapolating from rodents to humans due to limitations with respect to sensitivity, reproducibility, and relevance to complex neurodevelopmental diseases. The DNT-HEI program aims to expand beyond traditional rodent studies to innovate and implement new strategies in three distinct areas: 1) **screening** for compounds with developmental neurotoxic potential (e.g. humanized cells and /tissues, alternative animal models, and in silico models), 2) use of **predictive methodology** that is translatable to human populations (e.g., behavioral and imaging studies) and 3) **modeling toxicological data to exposure assessments** to contextualize DNT findings (e.g., in vitro, in vivo exposure (IVIVE) extrapolation and molecular assessments).

Finally, we plan to partner with clinicians, epidemiologists, and advocacy groups to understand their research needs and develop predictive strategies that will benefit human health.