Hemant Misra, J Clin Toxicol 2014, 4:4
http://dx.doi.org/10.4172/2161-0495.S1.012

OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Summit on
Toxicology & Applied Pharmacology
October 20-22, 2014 DoubleTree by Hilton Hotel Chicago-North Shore, USA

Hemant Misra
Prolong Pharmaceuticals, USA

Stress response in living organism and laboratory animals to pollutants

Pollutants are contaminants introduced into the environment that may have impact on the environment and the organisms within that environment. These pollutants may come from several sources and can contaminate land, water, and air. Some pollutants dissipate or are converted to non-toxic products quickly whereas other pollutants persist and accumulate through the food chain as larger organisms consume smaller organisms. The organisms living within those environments are exposed to the pollutants primarily by inhalation, dermal exposure, or ingestion of the pollutants. The types of pollutants include pesticides (insecticides, herbicides, fungicides, etc.), metals, solvents and vapors, and radioactive materials.

Organisms have mechanisms for detoxifying or eliminating pollutants, but these mechanisms may be stressed or overwhelmed resulting in toxicity to the organism. The route and level of exposure can have an impact on both the magnitude and target of toxicity. There are typically target organs/tissues/molecular components that can be identified, and the resulting signs of toxicity can be correlated to the target of the pollutant within the organism. Pollutants can induce stress to an organism at several levels and these signs of stress can manifest in several ways including changes to behavior, biological systems, and at the molecular level. Some of the relevant targets that could lead to these changes involve the central nervous system (CNS) at the systems level and oxidative stress at the molecular level. Pollutants may inhibit or excite receptors, induce degeneration, or be metabolized to reactive molecules. There are a number of complicating factors which influence the type of stress or toxicity that will occur. These factors include the presence of co-pollutants, species, lifestyle choices, physical health, age, gender, and ethnicity. The source for our observations includes epidemiological studies, field/clinical studies, and in vitro/in vivo lab studies.

Rodents have been used extensively as animal models for these studies, but many times the data does not translate directly to other species. It is important to remember that pollutants can have an effect on how organisms respond to stress and that stress can also affect the response of organisms to pollutants.

Biography

Hemant Misra received his PhD from Lucknow University in Medicinal and Pharmaceutical Chemistry and has published over 55 articles and a patent. He is VP Clinical Development for Prolong Pharmaceuticals. He has over 30 years of biopharmaceutical development, global clinical study management and corporate development experience. He has managed drug development, CGMP manufacturing, CTM, quality systems and multiple global clinical trials.

hmisra@prolongpharma.com