



Potential Neurotoxic Effects of Anesthetics during Development and Potential Protective Agents

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A great deal of concern has recently arisen regarding the safety of anesthesia in infants and children. There is mounting and convincing preclinical evidence in rodents and non-human primate that anesthetics in common clinical use are neurotoxic to the developing brain *in vitro*, and cause long-term neurobehavioral abnormalities *in vivo*. An estimated 6 million children (including 1.5 million infants) undergo surgery and anesthesia each year in the USA alone, so the clinical relevance of anesthetic neurotoxicity is an urgent matter of public health.

In this talk, I would like to present our progress and our efforts in trying to understand how specific receptor subunits and intracellular signaling events are involved in anesthetic agent or NMDA antagonist-induced neurotoxicity. Using both *in vivo* and *in vitro* experimental models, we are exploring the gene expression profiling, biochemical and molecular mechanisms that underlie anesthetic-induced oxidative stress, particularly during sensitive developmental stages. I would also discuss how the application of molecular imaging (e.g., microPET) with isotope-labeled biomarkers (radio-tracers) may help to detect neurotoxicity at a sufficient resolution to resolve both major structures and neuronal activities in the brain of infants, young and adult animals. In addition, the protective roles of some anti-oxidant agents in anesthetic-induced neurotoxicity will be addressed.

Biography

Cheng Wang, M.D., Ph.D. is a Senior Scientist in the National Center of Toxicological Research (NCTR)/US Food and Drug Administration (FDA). He is also an Adjunct Faculty member in the Department of Pharmacology and Toxicology, University of Arkansas for Medical Sciences (UAMS).

Dr. Wang is currently the P.I. on 4 grants supported by the NCTR/FDA, National Toxicology Program and NICHD. He is currently responsible for leading a research team that provides unique and highly specialized skills in toxicology, pharmacology and systems biology research. His research efforts have resulted in about 50 peer-reviewed research articles in prestigious journals and 10 book chapters. Dr. Wang is the Editor in Chief of the book entitled "Developmental Neurotoxicology Research: Principles, Models, Techniques, Strategies, and Mechanisms". He is serving as an editorial board of 3 reputed journals and reviewer of 10 journals.

Dr. Wang was awarded the Outstanding Performance Award at the Society of Toxicology 44th Annual Meeting and the 2007 FDA Scientific Achievement Award for Excellence in Laboratory Science. He also was awarded the 2008 FDA Group Recognition Award for the Pediatric Anesthesia Research Group.