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Aquatic ecotoxicity assessment of nanoparticles

Clean water is at the very core of human survival. Aquatic contamination occurs for multiple reasons ranging from taking the water sources for granted, negligence in waste disposal, deliberate contamination, and technological innovations outpacing development of effective guidelines for life-cycle management and regulations to properly recycle/reuse/dispose commercial products, especially prepared using nanoparticles. Elsewhere, we presented potential toxicity of nanosized particles of stannum dioxide, cerium dioxide, silver and iron oxide using model of the sea urchin *Paracentrotus lividus*, Zebra Fish and their off springs. Passage through membranous barriers via the digestive tract to the coelomic fluid is the subject of ongoing study using biomarkers, such as coelomic fluid inside coelomocytes (uptake), cholinesterase activity, and using expression of stress-related proteins (HSP70) and Gonads morphological features. A strategic S&T focus of the ICWI is to identify, assess, and recommend revolutionary conceptual Chem.-Bio Defense solutions and provide strategic solution pathways using field-ready technologies. Ongoing research aims to detect, counter, and mitigate potential security threats and is at the core of our current and ongoing investigations. Aquatic (nano) ecotoxicity is arguably the least understood and requires systematic investigation. An outline of dispersion and characterization methodologies of harmful NPs (weaponized NPs) in different aqueous media will be presented along with acute toxicity and risk assessment methodologies. We present our research activities on genotyping and sequencing genetically modified biological systems which are crucial to identify such risks, and trophic transfer and biosecurity implications of NPs and GMOs dispersed intentionally.

Biography

Ashok Vaseashta received a PhD from the Virginia Polytechnic Institute and State University, Blacksburg, VA in 1990. He currently serves as Vice Provost for Research at Claflin University and Strategic Advisor/Fellow at the Institute for Advanced Sciences Convergence and International Clean Water Institute at Norwich University Applied Research Institutes. Previously, he served as a Professor of Physics and Physical Sciences and Director of Research at the Nanomaterials Processing and Characterization Laboratories, Graduate Program in Physical Sciences at Marshall University. Concurrently, he holds a visiting/distinguished Professorship at the 3 Nano-SAE Research Centre, University of Bucharest, Romania; Academy of Sciences of Moldova, Chisinau, Moldova; and at the Helen and Martin Kimmel Center of Nanoscale Science at the Weizmann Institute of Science, Israel. In 2007-08, he was detailed as a William C. Foster fellow to the Bureau of International Security and Nonproliferation at the US Department of State working with the Office of Weapons of Mass Destruction and Terrorism and Foreign Consequence Management program. He also served (2009-13) as Franklin Fellow and strategic S&T advisor in the office of Verification and Transparency Technologies/Arms Verification and Control in the Bureau of Arms Control Verification and Compliance, Office of Verification and Transparency Technologies at the US Department of State. He is a fellow of the American Physical Society, Institute of Nanotechnology, and New York Academy of Sciences. He was awarded Gold medal by the Armenian National Polytechnic University (formerly State Engineering University of Armenia) for his contribution to Nanotechnology. In addition, he has earned several other fellowships and awards for his meritorious service including 2004/2005 Distinguished Artist and Scholar award. His research interests include; counterterrorism, unconventional warfare, critical-Infrastarture protection, biosecurity, advanced and nano materials for development of chemical-bio sensors/detectors, environmental pollution monitoring/detecting and remediation, and green nanotechnology. He authored over 200 research publications, edited/authored six books on nanotechnology, presented many keynote and invited lectures worldwide, served as the Director of four NATO Advanced Study Institutes/Advanced Research workshops supported by Emerging Security Challenges Division of the Science for Peace and Security, and co-chair of an International Symposium on Nanotechnology and Environmental Pollution Prevention (ISNEPP).

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