

## Environmental Toxicology 2017



12<sup>th</sup> International Conference on

## ENVIRONMENTAL TOXICOLOGY AND ECOLOGICAL RISK ASSESSMENT

October 19-20, 2017 | Atlanta, USA

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# Keynote Forum

Day 1

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**Gary D Rayson**

New Mexico State University, USA

**Phytofiltration: Investigations of passive heavy metal binding to plant-derived materials**

The ability of non-viable biologically generated materials to remove heavy metal ions from contaminated water has been recognized for several years. Such biogenic materials are not, however, widely used as substrates for the separation or preconcentration of metal ions. Much of the reluctance to use these potentially inexpensive materials stems from a lack of an acceptable level of predictability regarding their behavior in real world systems. This is primarily a result of an incomplete understanding of the fundamental chemical interactions governing the binding of metal ions to plant-based biomaterials. We have selected for these studies a materials derived from the plant *Datura innoxia*. Because of the chemical complexity of this material, multiple orthogonal probes have been applied to the study of these materials. These probes have included both spectroscopic techniques and derivation of thermodynamic parameters. Chemical functionalities containing carboxylates have been identified as responsible for sorption of heavy metal ions. These involve both the formation of surface complexes and electrostatic attraction to the negatively charge material. Studies of heavy metal ion sorption to root and stem tissues will be described. The impact of these findings on assessment of biosorbent for contaminated water remediation will be discussed.

**Biography**

Gary D Rayson has received his Bachelor of Science (BS) degree in 1979 from Baker University (Kansas) in Chemistry and Mathematics and his Doctorate (PhD) in Chemistry from the University of Texas at Austin in 1983. Following a Postdoctoral position at Indiana University, he joined the Faculty in the Chemistry and Biochemistry Department at NMSU in 1986, where he currently holds the rank of Professor. His field of study is the development and application of optical spectrochemical methods of analysis to the investigation of chemically complex systems (e.g., high temperature, environmental or biological).

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**Wojciech Wasowicz***Nofer Institute of Occupational Medicine, Poland***Selenium and human cancer: From epidemiological data to molecular biology study**

There is a growing interest in the biological role of selenium (Se) with respect to both protection of human health and prevention of diseases, among others to cancer prevention. Epidemiological studies, including retrospective, prospective and intervention ones, show that a low Se level may increase the risk of certain cancers. However, it should be noted that there is also a relatively large number of studies, in which no effect of Se on cancer has been observed. In the light of recent studies, it may be assumed that not only low but also high Se status may be associated with an elevated cancer risk. Thus, evidence for the chemopreventive role of Se, based on the current epidemiological data, seems to be conflicting. To find an accurate explanation of this divergence, researchers have begun to study the role of Se in the development of cancer at the molecular level. It has been found that certain genetic variants of the selenoproteins' encoding genes may modify cancer risk. However, the results of these studies also remain conflicting. To sum up, most of studies on the relationship between selenium and cancer focus either on the association between Se status and cancer risk or on the association between genetic polymorphism of selenoproteins' genes and cancer risk. Combining both types of data (concerning both dietary and genetic factors) would be more informative and valuable in the assessment of cancer risk development, which was indicated in our recent study. In the case-control study, lung cancer risk associated with Se status was compared between individuals possessing different genetic variants of 15 kDa selenoprotein (Sep15), the protein possibly involved in cancer development due to its redox activity. The preliminary results of the study indicated that Sep15 polymorphism significantly modified lung cancer susceptibility associated with Se status. Based on our findings, we conclude that studies on the relationship between diet and cancer should focus on the interactions between dietary and genetic factors rather than on the study of each factor separately. Data from such studies would be especially interested in view of the intervention trial planning. Prior to supplementation, DNA genotyping should be first performed to select individuals with certain genetic background. This would allow to avoid (at least to some extent) the study bias associated with genetic variation and to identify individuals who, due to the specific gene and nutrient interaction, are susceptible to cancer.

**Biography**

Wojciech Wasowicz is a full Professor at Nofer Institute of Occupational Medicine. He is the Head of the Biological and Environmental Monitoring department. He has a background in Biochemistry, Analytical Chemistry and Toxicology. He has wide experience with Toxicology of metals and its interactions with microelements, oxidative stress markers and antioxidant enzymes. The next field of interest is potential protective role of some antioxidants against chemicals. He has experience in engineered nanomaterials, nanoparticles and health effect of nanoparticles. He shows a great scientific activity confirmed by numerous publications, and active participation in symposia, conferences and scientific meetings organized in Poland (Polish Society of Toxicology) and abroad (EUROTOX, IUTOX), and has given numerous lectures as keynote and plenary speaker in international congresses. He is a Member of Polish MAK Value Expert Commission and a Member of OECD Expert in working party on manufactured nanomaterials. Since 2008, he is the President of Polish Society of Toxicology. He has 240 scientific papers published, mainly in journals of international recognition (more than 2000 citation).

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# Keynote Forum

Day 2

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**Olurominiyi O Ibitayo**

Texas Southern University, USA

**Agricultural Pesticide Use in Developing Countries: Bane or Blessing?**

The need to boost agricultural productivity has prompted developing countries to aggressively pursue through subsidies, tax discounts, and exemption from import tax, the use of agriculture inputs such as fertilizers and pesticides. Pesticides are designed as “poisons” to destroy pests but the capacity to “destroy” often extends to adverse human health and environmental effects. Sources of pesticide poisoning include occupational, whereby vendors repackaging pesticides in small sachets and sell in open markets. Also, pesticide poisoning may be accidental through drifts from sprayed fields, early reentry to sprayed fields, and unknowingly eating animals or crops that contain pesticide residue. Documentation include the hospitalization of a cocoa farmer’s family after eating vegetable undergrowth of coca trees sprayed with lindane, and the reported cases of vomiting due to the consumption of noodles that contains residues of carbofuran in Nigeria. Some of the factors that have been identified as contributors to pesticide poisoning in developing countries include; lack of the use of Personal Protective Equipment (PPE) such as gloves, nose and face masks, overalls and shoes, or the use of ineffective items such as covering the face with paper masks, the use of leaking equipment or domestic utensils for mixing pesticides, and the use of empty pesticide containers to store water for humans and domestic animals. Others include the extensive lack of knowledge about the adverse effects of pesticides, and lack of regulations regarding the importation, labelling, use and disposal of pesticides, and the lack of enforcement of any existing regulations. Regarding the latter, pesticides that have banned or placed on restricted use in industrialized countries due to the pesticides’ toxicities are often imported into developing countries. Recommendations include establishing public education programs emphasizing the adverse impacts of these pesticides, training and certification of pesticide applicators, and the provision of PPE free or at subsidized rates. The contention in the literature that PPE are “completely unrealistic for the hot tropical climate” especially of sub-Sahara Africa is unfounded and misleading. Sub-Sahara Africa is not monolithic both as a region or as individual countries. The temperature ranges within the region are applicable to many industrialized countries that use PPE. Finally, it is necessary to establish and implement appropriate policies for importation, labelling, use and disposal of pesticides.

**Biography**

Olurominiyi O Ibitayo is working as a Professor in Barbara Jordan-Mickey Leland School of Public Affairs, Texas Southern University, Houston, Texas. He received his PhD in Public Administration at Arizona State University. His research interests are in the areas of environmental and occupational risk assessment/analysis, environmental justice, neighborhood-level research and emergency management. His publications have appeared in reputable journals such as *Risk Analysis*, *Journal of Hazardous Materials*, *Journal of Emergency Management and HortScience*.

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