

Preface

Ever increasing amounts of toxic chemicals are polluting our environment. Due to different rules and regulations, use of some of well-known toxic chemicals have been reduced such as use of polychlorinated biphenyls (PCBs) in industries but there is an increase abundance of many other polluting chemicals such as pesticides and arsenic. Also some of these toxic chemicals are highly resistant to degradation or removal and thereby continue to pollute the soil and waters even 40-50 years after the stoppage of usage or after chemical accidents. This implies that many of these chemical pollutants are getting accumulated in our food chain and in our body continuously. Hence, even there is a measurable environmental pollution, and there are means of measuring immediate effects on humans, there is very little or no systematic way for measuring the long term genotoxic effects. In fact chronic exposures to sub-acute dosage of chemicals appear to be more genotoxic than a short acute exposure to a single relatively high dosage.

The need to quantitate the genotoxic effects of pollutants have led to development of assays to detect mutations in the genetic code, assays

to detect chromosomal damage such as chromosomal aberrations test or micronucleus test. Organizations worldwide such as FDA, MHRA, etc. have some approved screening tests to assess the genotoxic effects and to reduce the adverse genotoxic effects such as cancer, immunodeficiency, sterility and fetal loss.

In recent years there is an increasing availability of tools to study the genome-wide effects of different chemicals such as microarrays, next-generation sequencing and proteomic approaches. These have led to development of the field of toxicogenomics. Toxicogenomics deals with the collection, interpretation, and storage of information about gene and protein actions in response to toxic substances. Toxicogenomics combines the field of toxicology with genomics or proteomics. This has also led to creation of huge databases such as "The Comparative Toxicogenomics Database". Toxicogenomics has the potential to be used as an efficient tool for assessing genotoxicity.

In this special edition we would like to present a collection of papers which tries to address the difficult question of assessing genotoxic effects of environmental pollutants.

January 2013

**Madhusnata De
Supriyo De**