

## Career Opportunities in Toxicology

### What is Toxicology?

Hardly a week goes by without hearing that a chemical may potentially threaten our health—pesticides in the food we eat, pollutants in the air we breathe, chemicals in the water we drink, toxic dump sites near our homes. Chemicals make up everything around us. Which chemicals are really dangerous? How much does it take to cause harm? What are the effects of a particular chemical? Cancer? Nervous system damage? Birth defects?

Finding scientifically sound answers to these very important questions is what toxicologists do, using the most modern molecular, genetic, and analytical techniques available. Toxicology combines the elements of many scientific disciplines to help us understand the harmful effects of chemicals on living organisms.

An additional, important aspect of toxicology is determining the likelihood that harmful effects will occur under certain exposure circumstances, sometimes called "risk assessment." If the risks are real, then we must be able to deal with them effectively. If the risks are trivial, then we must ensure that valuable public resources are not spent ineffectively. Such important decisions must be made with the best scientific evidence possible.

The responsibility of the toxicologist is to:

- 1) develop new and better ways to determine the potential harmful effects of chemical and physical agents and the amount (dosage) that will cause these effects. An essential part of this is to learn more about the basic molecular, biochemical and cellular processes responsible for diseases caused by exposure to chemical or physical substances;
- 2) design and carry out carefully controlled studies of specific chemicals of social and economic importance to determine the conditions under which they can be used safely (that is, conditions that have little or no negative impact on human health, other organisms, or the environment);
- 3) assess the probability, or likelihood, that particular chemicals, processes or situations present a significant risk to human health and/or the environment, and assist in the establishment of rules and regulations aimed at protecting and preserving human health and the environment.

### Why Consider a Career in Toxicology?

#### ***Challenges***

Wise use of chemicals is an essential component of the high standard of living we enjoy. The challenge to toxicologists is to ensure that we are not endangering our health or the environment with the products and by-products of modern and comfortable living. As a career, toxicology provides the excitement of science and research while also contributing to the well-being of current and future generations. Few other careers offer such exciting and socially important challenges as protecting public health and the environment.

### ***Opportunities***

With the increase in our health consciousness, as well as concern for our environment, a wide and growing variety of career opportunities exist in toxicology.

Toxicologists:

- participate in basic research using the most advanced techniques in molecular biology, analytical chemistry and biomedical sciences;
- work with chemical, pharmaceutical and many other industries to test and ensure that their products and workplaces are safe, and to evaluate the implications of new research data;
- work for local and federal governments to develop and enforce laws to ensure that chemicals are produced, used and disposed of safely; work in academic institutions to teach others about the safe use of chemicals and to train future toxicologists.

### ***Attractive Salaries and Professional Advancement***

The demand for well-trained toxicologists continues to increase. Highly competitive salaries are available in a variety of employment sectors. Increasing specialization in the science of toxicology now provides the toxicologist with a competitive advantage over chemists, engineers, biologists or other scientists without specialized training in toxicology. Opportunities are available for career advancement to executive levels for those with organizational and administrative skills and a superb record of scientific achievement.

## **What Do Toxicologists Do?**

***Research***

***Product Safety Evaluation***

***Teaching***

***Public Service, Regulatory Affairs and Consulting***

## **Where can I find more information?**

SOT – Society of Toxicology: <http://www.toxicology.org>

SETAC – Society of Environmental Toxicology and Chemistry: <http://www.setac.org/>