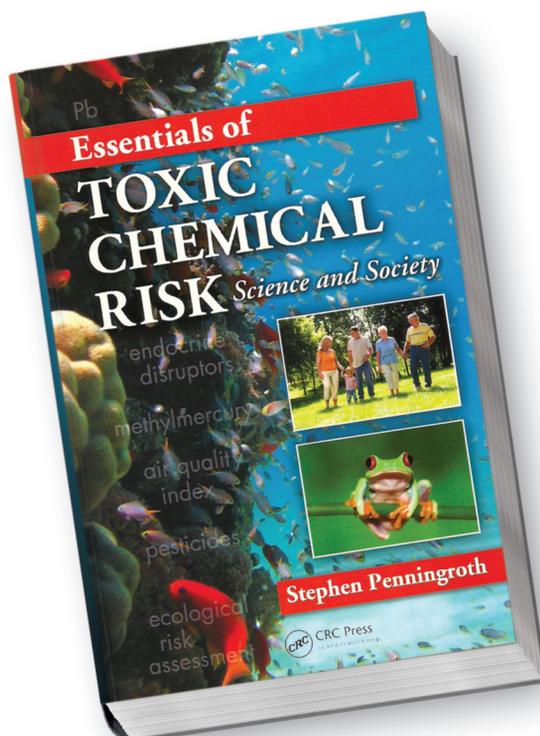


Essentials of Toxic Chemical Risk Science and Society

Stephen Penningroth

The broad scope of toxicology, from the study of fundamental mechanisms to the measurement of exposure, including toxicity testing and risk analysis, makes the field so multidisciplinary that it is sometimes called a "borrowing science". Usually, to assess the risk of anthropogenic chemicals in the environment, the principles and methods of an array of disciplines are routinely incorporated into toxicological investigations. A partial list from which toxicology borrows concepts and information may include: molecular biology, chemistry (analytical, organic, inorganic and biochemistry), physiology, medicine (veterinary and human), computer science and informatics. However, because of this borrowing nature of the science of toxicology, a confusing jumble of concepts exists, that makes the discipline hardly accessible to scholars in other fields, including the social sciences and humanities, not to mention society.

The book *Essentials of Toxic Chemical Risk* by Stephen Penningroth introduces the basics of toxicology from a risk analysis perspective, using a journalistic style that makes scientific concepts accessible to a wide audience. The text is organized into 3 basic threads and 10 chapters. One thread deals with the science that underlies toxic chemical risk assessment. It covers the fate and transport of chemicals in the environment, dose-effect, animal toxicity testing, and human epidemiology. The second thread works at the smallest scale in toxicological risk assessment and conveys a working knowledge of the biology of toxicity. The issues covered include the uptake, distribution and elimination of toxic chemicals including first-order rate constants and calculations



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of body burdens. One chapter illustrates how cancer and other diseases can be caused by toxic chemicals. The last thread is the relationship among assessing toxic chemical risk, protecting human health and reducing environmental stress. The reader will find here valuable discussion on risk management and strategies for balancing precaution and socio-economic benefits.

The author has carefully selected topics that consider equally organismic toxicology, ecotoxicology and risk management issues. In the book, some experiments are described in detail to indicate the logic supporting the concepts. The student of risk will find numerous schematic drawings that will help to understand the ideas presented in the text, and suggested reading, as well. Each chapter ends with valuable probing questions and comments followed by answers to them. Some of the questions are

deliberately challenging and they may provoke the reader to think more deeply about many of the issues and concepts presented. Taking together, the book of S. Penningroth provides a thorough introduction to the science of toxicology, it is written in a plain language, and as a book on both theoretical and applied science, it makes an important contribution to the field.

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