

Basic Toxicology

Fundamentals, Target Organs,
and Risk Assessment

Frank C. Lu

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Consulting Toxicologist
Miami, Florida

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BASIC TOXICOLOGY: Fundamentals, Target Organs, and Risk Assessment

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ologic evaluation, including risk assessment, and the type and amount of data required to carry out such evaluations.

Part II covers topics related to conventional toxicity studies of different durations; it also deals with the nature of and tests for such specific effects as carcinogenesis, mutagenesis, and teratogenesis. Part III deals with toxic effects on specific target organs: the respiratory system, liver, kidney, skin, eye, nervous system, and a number of others. The effects of toxicants are not described systematically, but they are used in illustrating various categories of toxic effects and the underlying mode of action. Knowledge of general toxicology in its diverse field will promote better understanding of toxicologic data on specific toxic substances and their interactions.

Preface

This book is intended as an introductory text for students taking toxicology courses and for those involved in allied sciences who require a background in toxicology. Furthermore, since toxicology is a vast subject and is fast expanding, the book is likely to be useful to those who have become specialized in one or a few areas in toxicology but wish to brush-up in other areas.

In preparing this book, attempts were made to have a relatively comprehensive coverage of the subjects as well as to maintain brevity. The latter was achieved by the inclusion of some appendices and a large number of references to assist readers interested in additional information.

Toxicology is an important science. It provides a sound basis for formulating measures to protect the health of workers against toxicants in factories, farms, mines, and other occupational environments. It is also valuable in the protection of public health against hazards associated with toxic substances in food, air, and water. Toxicology has played and will continue to play a significant role in the health and welfare of the world.

Cognizant of the importance of toxicology, WHO organized a toxicology training course in China in 1982, as part of the ongoing China-WHO collaborative program on medical sciences. The course consisted of two parts. The author was invited to lecture on basic toxicology, whereas lectures on occupational toxicology were given by others. This book originated from the author's lecture notes.

The subjects covered in the book are divided into three parts; they are general principles, testing procedures, and target organs. The first part deals with absorption, distribution, and excretion of toxicants; their biotransformation (detoxication and bioactivation); their adverse effects; and factors that modify their effects. It also includes chapters dealing with various approaches to toxic-

cologic evaluation, including risk assessment, and the type and amount of data required to carry out such evaluations.

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Part One

General Principles of Toxicology

