Introduction to Toxicology

John Timbrell

THIRD EDITION

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Preface to the first edition

There is an ever increasing use of chemicals in modern society and, because of this, toxicology is becoming an increasingly important subject. Taught courses are now available in different countries at various levels to educate young toxicologists. Currently, however, there are no introductory texts that are reasonable inexpensive, and that serve as an introduction to the subject for students with backgrounds in various disciplines. Thus, there are hardback textbooks, such as *Cassarett and Doull's Toxicology*, for dedicated toxicologists and various specialist texts for particular aspects of toxicology. The smaller textbooks that are available are generally biased towards one particular aspect or interpretation of toxicology, such as the biochemical, pathological, pharmacological or pharmacokinetic aspects. However, most of these are either too expensive or too specialist for the novice toxicologist, the undergraduate or the postgraduate who simply wishes to become familiar with the subject as a whole.

Toxicology is a multidisciplinary subject, which has a large and diffuse literature and it is developing rapidly. Bringing this information together is difficult and time consuming for the student. Consequently there is a need for a cohesive text at the introductory rather than more advanced level. These deficiencies in the market became clear to me whilst being involved in teaching first a Masters course and then a Bachelors degree course in toxicology.

This book, therefore, has arisen from my awareness of the need for an introductory text for myself and for my own students and its content is largely based upon the information I have amassed in the preparation of lectures for these same students. I am indebted to these students for being the foil for this preparation and also to various colleagues for their helpful comments.

London, 1988

Preface to the third edition

As with many areas of biomedical science, the study of toxicology has been influenced by fundamental changes in biochemistry and molecular biology and now by the newly emerging sciences of genomics, proteomics and metabonomics. These are having a major impact on the study and potentially an understanding of the interactions of chemicals with living sytems. Also new areas and types of interaction have emerged since the second edition of this book. Some of these, such as interactions with the peroxisome proliferator activated receptor, are now mentioned in this new edition. However, this book is primarily concerned with the basic underlying principles of toxicology at the introductory level and these remain largely unchanged. Therefore the *format* of the previous editions has been retained with specific examples used to illustrate these basic principles.

The major changes have been updating the existing text in relation to new knowledge or nomenclature and the inclusions of new examples. Thus there is now a much enlarged section on risk assessment and new sections on *in vitro* toxicology, on endocrine disrupters and on the treatment of posioning, for example. A number of specific case studies for particular chemicals or toxins have also been included.

This third edition now has chapter outlines and summaries and questions with answers, as teaching aids. For those requiring more extensive and detailed information there are a number of excellent reference texts which are listed in the bibliography at the end of each chapter.

The number of chemicals used in society will inevitably increase and consequently so will the risk of chemical exposure, even though the use and manufacture of chemicals may now be better regulated. Thus despite the recent regrettable closure, contraction or realignment of research institutions and courses specifically orientated towards toxicology in the UK, the subject of toxicology is no less important to our society. Therefore, scientists with a broad overview of toxicology will always be required as well as more specialized scientists such as molecular biologists. I hope that this book will help in that endeavour by stimulating an interest in toxicology.

As with previous editions, this third edition has benefited from my teaching activities at different levels and in many different places and countries for which I am grateful.

Finally, special thanks to Cathy for her specific help and support.

London, April 2001