

## Book Reviews

*A Guide to Practical Toxicology—Evaluation, Prediction and Risk*

By Adam Woolley, DABT, FRCPath

CRC Press, April, 2003.

ISBN: 0-748-40923-8. 312 pages. Price: \$59.95.

Although toxicology has become increasingly important in the 21st century, and although it is now taught as an academic discipline in many universities worldwide, much of the craft and everyday knowledge involved in conducting and interpreting studies performed to characterize the potential hazards of the substances which are of everyday concern (so called “regulatory toxicology” or “testing”) goes on both ignored by the academic world and largely undocumented in scholarly publications. Much of what many years of experience teaches is being lost because of this (as it has previously been in the past), only to have to be relearned by each new generation of practitioners. These points of the craft—in some cases, almost the unspoken little secrets of a professional community and their near colleagues—are not limited to laboratory techniques, but also extend to the interpretation of results and the use and presentation (with resulting influence on public and regulatory perception) of the resulting data. Although there have been a few volumes seeking to capture such knowledge (Arnold et al. 1990; Gad and Chengelis 1998; and Haschek et al. 2002 come to mind), Mr. Woolley is to be much commended for this valuable contribution to countering this trend. All the more so because of the broad scope of his effort, which, unlike the other works cited, seeks to address more of the interpretation, use and perception of the results of such tests.

The volume comes in 15 well-written chapters, with some spill over of concepts between the chapters—meaning that, for many topics, one cannot simply go from the table of contents or index directly to a chapter or few pages, but rather must read several chapters or much of the book to capture the full sense of the issues involved. Many helpful tables are scattered throughout the book, making a complete reading a rewarding (and essential, for full understanding) exercise. The book's principal drawbacks are also part of its virtues—its brevity (just under 300 pages of text, making it a suitable weekend read but also forcing one to go elsewhere for details) and the interconnected nature of the chapters. This said, it should be recommended to all those entering the field as professionals so that they might understand the field outside of academia, where most graduates will find employment upon completion of their degrees.

The first chapter blends some history of toxicology with seeking to convey (successfully, I believe) some key concepts about toxicology for both new practitioners and our society.

- (1) That all things are toxic, differing only in degree and that any such findings must be considered in relationship to the rest of the world.
- (2) That societal perception of risk in general and toxicity in particular are frequently off the mark.

In order to understand the relevance of any presentation of the toxicity or hazard of a material, one must consider it in relation to other substances in terms of a shared measurement system for effects. The chapter then blends nicely into the second chapter, which develops the concept of what is normal in biologic systems, and how the variability in such normality and its measurements requires the use of concurrent control groups as an essential standard for any evaluation, and yet also requiring an understanding of variability seen in the past (that is, give some thought to what has been seen in historical controls) to understand relevance to the broader world as a whole. Included are short discussions on the regulatory underpinnings of testing and the use of data, and on the principals underlying model (that is, test animal) selection.

What follows is first, a brief presentation on *in vitro* test systems. Then there are a series of chapters on the basic principles of testing and on the most frequently performed of specific types of tests—general, reproductive and developmental, and genetic toxicity, carcinogenicity, irritation and sensitization testing, and finally environmental toxicity testing. This portion of the book closes with a chapter on interpretation of results for the previously discussed multiple sets of test types, which also presents two case histories as examples of the issues involved.

Next, Woolley proceeds to a chapter on the actual prediction of hazard from the data generated by current test systems. This theme is carried forward by the following chapter, which covers risk assessment and perception, computer models for predicting hazards based on structure-activity relationship (SAR) approaches and the use of such hazard assessments and predictions to set various limits for exposure.

The final chapter is a brief one on the future of safety assessment, focusing primarily on the challenges facing the discipline.

This is followed by a series of overly brief appendices presenting a short list of websites, a “select” glossary, notes, references, and a bibliography.

The appendices were, to this reviewer, perhaps the major disappointing portion of the volume, and would have been of significant value if not so brief. It should also be noted that the book is written primarily from a European perspective, which shows most when regulations are discussed.

The book is both an excellent read and a valuable resource, and well worth the price to either those of us who practice in this field or to those who need or want to understand it.

## REFERENCES

- Arnold, D. E., H. C. Grice, and D. R. Krewski. 1990. *Handbook of in Vivo toxicity testing*. San Diego: Academic Press.
- Gad, S. C., and C. P. Chengelis. 1998. *Acute toxicology testing*, 2nd ed. San Diego: Academic Press.
- Haschek, W. M., C. G. Rousseaux, and M. A. Wallig. 2002. *Handbook of toxicologic pathology*, 2nd ed. San Diego: Academic Press.

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