

## BOOK REVIEW

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### Review of: *Forensic DNA Typing, 2nd edition*

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**REFERENCE:** Butler JM. *Forensic DNA typing. Biology, technology and genetics of STR markers*, 2nd ed., Elsevier Academic Press, Burlington, MA, 2005, 660 pp., ISBN: 0-12-147952-8, \$79.95 from the publisher.

This second edition of Dr. Butler's *Forensic DNA Typing*, the first edition of which appeared in 2001, is more than twice the size of the original—reflecting the astonishing rate at which new information is accumulating in this field. If developments in forensic DNA typing continue at this pace, a hypothetical third edition, appearing around 2009, will be more than 900 pages long.

The book is divided into three major sections, Biology, Technology, and Genetics. The first, introductory chapter precedes the first major section, and the chapter on using DNA for mass disaster victim identification (which includes the efforts made following the terrorist destruction of the World Trade Center in 2001, along with the Waco Branch Dividian Fire and Swissair Flight 111) is in a major section of its own, called Biology, Technology and Genetics. There are seven appendices. Peter Gill of the U.K. Home Office Forensic Science Service contributed the Foreword.

In the Biology section are a review chapter, followed by chapters that include specimen collection, extraction and quantitation, PCR, commercial kits and commonly employed STRs, stutter and non-template addition, microvariants, null alleles, mutation rates, forensic issues like degradation, PCR inhibition and low copy number amplifications, SNPs, Y chromosome markers, mitotyping, and nonhuman (including microbial) DNA testing.

In the Technology section are chapters that include separation and CE, detection by fluorescent dyes and silver staining, instrumentation, genotyping issues, laboratory validation, new technologies, automation and expert systems, and CODIS and databases. In the Genetics section are chapters that cover basic principles, population databases, profile frequency estimates, likelihood ratios and source attribution, approaches to the interpretation of mixed and degraded specimen profiles, and kinship and parentage applications. As noted, the chapter on using DNA to help identify human remains in mass disasters is in its own section (presumably because it involves all of “biology,” “technology” and “genetics.”) There are appendices covering the reported sizes and sequences of the common STRs, U.S. population data, suppliers of equipment and products, the D.A.B. recommendations on QA standards and on statistics, the NRC II recommendations, and some example DNA cases.

From these brief content descriptions, it will be clear that the book is an exceptionally comprehensive reference, touching on ev-

ery relevant aspect of current forensic DNA typing practice. Apart from coverage, the book is well edited, attractively laid out, and makes productive use of its four-color format. Abundant figures and tables help explain and enumerate basic concepts as needed. A cute feature, called a D.N.A. (for Data, Notes, Applications) box, appears throughout the text, and covers a variety of subjects (how the O. J. Simpson case emphasized the importance of how biological evidence is collected, allele specific mutation rates, a perspective on publication of STR primer sequences, identification of the Vietnam Conflict unknown soldier, and family of Tsar Nicholas, calculating mitotype frequency estimates, energy-transfer dyes, general match probabilities, etc. etc.). These boxes were apparently designed to contain what we might call “reader-optional” information—a reader gets additional information from them, but skipping them does not detract from understanding the main text.

A feature that is found in several parts of the book that I found particularly appealing is the detailed sourcing of information. The original reference for each of the core CODIS STR loci appears in a table, for example. And there are many other instances where a reader will be able to find original references and sources easily.

This is a very good book, and will serve many practitioners and students of forensic DNA typing as a single source reference. It could also serve as a text for a one semester graduate level course in forensic DNA typing and technology. There is probably a bit too much material for a single semester undergraduate course, even at the upper division, but if the course were extended over two semesters, the book would work fine for students with appropriate background.

It is hard to think of a topic in forensic DNA typing that is not treated in the book. Accordingly, it will be a sort of standard reference book in the area. If there are plans to keep the book up to date every few years, it has the potential to become *the* standard reference, perhaps something akin to Clarke in drugs and toxicology. Perhaps the relentless pace of change that has characterized DNA technology so far will slow, and make the job of keeping the book up to date a bit easier and more appealing for the author. The rest of us can hope so. A final point is that the book is a phenomenal bargain in this day and age at around \$80 a copy.

There are probably minor things about which one could quibble, but it doesn't seem productive to do so when the overall product is so good.

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