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BOOK REVIEW

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Review of: *Molecular Forensics*

REFERENCE: Rapley R, Whitehouse D. Molecular forensics, 1st ed. West Sussex, England: John Wiley & Sons, 2007; 244 pp.

Because of the growing importance of forensic DNA analysis in the solution of violent crimes, an enormous interest has developed in the science and constantly changing technology that underlies its use. DNA analysis incorporates techniques and principles of many fields of study including molecular biology, biochemistry, genetics, and statistics. *Molecular Forensics*, an edited book composed of 14 chapters authored by an international panel of experts, focuses on the molecular biology of forensic DNA analysis. The book is written at a level that can be used in a molecular biology graduate program and is a good reference that academics and practitioners will find very useful.

The introduction provides the reader with a good perspective on the history of DNA technology and how it has evolved to its present state. Chapters include Current and Future Trends in Forensic Molecular Biology, Basic Tools and Techniques in Molecular Biology, Automated DNA Extraction Techniques for Forensic Analysis, Real-Time Quantitative PCR in Forensic Science, Minisatellite and Microsatellite DNA Typing Analysis, Application of SNPs in Forensic Casework, The X Chromosome in Forensic Science: Past, Present and Future, Mitochondrial Analysis in Forensic Science, Y-Chromosomal Markers in Forensic Genetics, Laser Micro-dissection in Forensic Science, Laboratory Information Systems for Forensic Analysis of DNA Evidence, Statistical Presentation of Forensic Data, Protein Profiling for Forensic and Biometric Applications, and Application of MRS (Magnetic Resonance Spectroscopy) in Forensic Pathology.

Forensic Science has become an "umbrella" discipline with many subfields. Although forensic practitioners should know a great deal about all disciplines within the umbrella of forensic science, the vast amount of information required for a practitioner has resulted in a recognition of the need for specialization. In the field of DNA analysis, there is a vast literature that has been published over the past two decades. DNA experts should have an understanding of the work done by investigators at the crime scene, and scientists in the laboratory and in the courtroom. Criminalists must also be aware of the role of law enforcement in obtaining information that can contribute to the reconstruction of the events of the crime and in ultimately solving cases. We have come to think of the DNA expert as being a specialist who is knowledgeable about the nature of biological evidence and the methods used to identify it and to determine its origin. However, the DNA expert must have a thorough understanding of the science in many different but related areas. The expert should know the history and evolution of DNA technology and its foundations in molecular biology, biochemistry, statistics, and population genetics. This book provides the reader with a perspective on the importance of molecular biology in the field of forensic science and takes us back through the history of DNA analysis. It addresses the development of the many techniques that have evolved and brings the reader to the present day and the techniques that are now used to achieve an identification of the source of the evidence.

This book has a very thorough discussion of the recognition of biological evidence; the isolation and quantification of DNA; the automated analysis of nucleic acid fragment sizes, databases and bioinformatics; polymerase chain reaction; and gene identification. There is a comprehensive discussion of the use of local and national databases in crime solution and prevention. There is some degree of overlap between chapters with some level of repetition; however, the reader will find that each chapter covers topics that are necessary and the overlap tends to reinforce what has been read in other chapters. I have found each chapter to be well written, well documented with many references, and to cover each topic accurately and thoroughly. In addition to the subject matter expected to be found in a book of this nature, such as DNA extraction, real-time PCR, analysis of DNA fragments, mitochondrial DNA and Y-chromosome analysis, and the statistical presentation of the genetic profiles that have been established, we also find very informative discussions of the genetics and molecular biology of the X-chromosome, protein profiling, biometrics, the use of laser microdissection in obtaining small amounts of tissue from biological specimens composed of two or more cell types, for subsequent DNA analysis, and magnetic resonance spectroscopy in assisting the medical examiner in the determination of the approximate time of death. DNA experts and forensic practitioners in related fields will find this book to be highly informative and a good addition to their libraries. This book is well worth reading and is highly recommended.

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