



# **FORENSIC DNA APPLICATIONS**

**AN INTERDISCIPLINARY  
PERSPECTIVE**

Edited by  
Dragan Primorac  
Moses Schanfield

# Forensic Dna Applications An Interdisciplinary Perspective

**Jane Moira Taupin**



## **Forensic Dna Applications An Interdisciplinary Perspective:**

**Forensic DNA Applications** Dragan Primorac, Moses Schanfield, 2023-04-24 Forensic DNA Applications An Interdisciplinary Perspective Second Edition is fully updated to outline the latest advances in forensic DNA testing techniques and applications It continues to fill the need for a reference book for people working in the field of forensic molecular biology testing and research as well as individuals investigating and adjudicating cases involving DNA evidence whether they be civil or criminal cases DNA techniques have greatly impacted obvious traditional forensic areas but such advances have also positively affected myriad new areas of research and inquiry It is possible today to think about solving forensic problems that were simply unheard of even a few years ago As such the book pulls all relevant research and applied science together into a detailed and comprehensive collection Part I begins with the history and development of DNA typing and profiling for criminal and civil purposes It discusses the statistical interpretation of results with case examples mitochondrial DNA testing Y single nucleotide polymorphisms SNPs and short tandem repeats STRs and X SNP and STR testing It also explores low copy number DNA typing mixtures and quality assurance and control Part II moves on to cover the various uses and applications of analyzing collected physical evidence victim identification in mass disasters analyzing animal DNA forensic botany and other unique applications Part III is dedicated to the latest advances and developments in human molecular biology and Part IV looks at policies and laws and ethics governing DNA evidence and its utilization in various cases and the courts Forensic DNA Applications Second Edition covers cutting edge research and advancements in the field and is the most up to date reference available Edited and contributed to by the world s foremost leaders in the field it is a must have reference for established professionals and an essential resource to legal professionals lawyers and judges dealing with civil and criminal cases involving DNA technology as well as students entering the fields of genetics and forensic DNA analysis

**Forensic DNA Applications** Dragan Primorac, Moses Schanfield, 2014-01-29 Forensic DNA Applications An Interdisciplinary Perspective was developed as an outgrowth of a conference held by the International Society of Applied Biological Sciences The topic was human genome based applications in forensic science anthropology and individualized medicine Assembling the contributions of contributors from numerous regions around the world this volume is designed as both a textbook for forensic molecular biology students and a reference for practitioners and those in the legal system The book begins with the history and development of DNA typing and profiling for criminal and civil purposes It discusses the statistical interpretation of results with case examples mitochondrial DNA testing Y single nucleotide polymorphisms SNPs and short tandem repeats STRs and X SNP and STR testing It also explores low copy number DNA typing mixtures and quality assurance and control The second section examines the collection and preservation of biological evidence under a variety of different circumstances and the identification of human remains including in mass disaster settings It discusses applications to bioterrorism investigations animal DNA testing in criminal cases pedigree questions and wildlife forensic

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**Forensic DNA Applications** Dragan Primorac, Moses Schanfield, 2023-04-24 Forensic DNA Applications An Interdisciplinary Perspective Second Edition is fully updated to outline the latest advances in forensic DNA testing techniques and applications It continues to fill the need for a reference book for people working in the field of forensic molecular biology testing and research as well as individuals investigating and adjudicating cases involving DNA evidence whether they be civil or criminal cases DNA techniques have greatly impacted obvious traditional forensic areas but such advances have also positively affected myriad new areas of research and inquiry It is possible today to think about solving forensic problems that were simply unheard of even a few years ago As such the book pulls all relevant research and applied science together into a detailed and comprehensive collection Part I begins with the history and development of DNA typing and profiling for criminal and civil purposes It discusses the statistical interpretation of results with case examples mitochondrial DNA testing Y single nucleotide polymorphisms SNPs and short tandem repeats STRs and X SNP and STR testing It also explores low copy number DNA typing mixtures and quality assurance and control Part II moves on to cover the various uses and applications of analyzing collected physical evidence victim identification in mass disasters analyzing animal DNA forensic botany and other unique applications Part III is dedicated to the latest advances and developments in human molecular biology and Part IV looks at policies and laws and ethics governing DNA evidence and its utilization in various cases and the courts Forensic DNA Applications Second Edition covers cutting edge research and advancements in the field and is the most up to date reference available Edited and contributed to by the world s foremost leaders in the field it is a must have reference for established professionals and an essential resource to legal professionals lawyers and judges dealing with civil and criminal cases involving DNA technology as well as students entering the fields of genetics and forensic DNA analysis

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**Forensic Reconstruction: Theory to Practice** Henry Lee, Elaine Pagliaro, 2024-10-14 Forensic reconstruction is intended for use by students and practitioners alike There are few books that concentrate on the process of crime scene reconstruction that also include some of the basic principles of forensic investigation These principles are examined in the first few chapters of the book and include the use of logic in examination and the admission of reconstruction evidence in American courts After a look at the basics this text looks at application of these standards in various applications of the reconstruction process Among the applications are those that may be found in other sources such as shooting reconstruction DNA pathology and bloodstain pattern analysis also included are more recent developments and unique areas such as profiling genetic genealogy and computational reconstruction as applied to airplane crashes Each chapter is written by a recognized expert in the field which adds a depth of understanding and case highlights not found in other texts

**Portable Spectroscopy and Spectrometry, Technologies and Instrumentation** Richard A. Crocombe, Pauline E. Leary, Brooke W. Kammrath, 2021-04-19 Provides complete and up to date coverage of the foundational principles enabling technologies and specific instruments of portable spectrometry Portable Spectroscopy and Spectrometry Volume One is both a timely overview of the miniature technologies used in spectrometry and an authoritative guide to the specific instruments employed in a wide range of disciplines This much needed resource is the first comprehensive work to describe the enabling technologies of portable spectrometry explain how various handheld and portable instruments work discuss their potential limitations and provide clear guidance on optimizing their utility and accuracy in the field In depth chapters written by a team of international authors from a wide range of disciplinary backgrounds have been carefully

reviewed both by the editors and by third party experts to ensure their quality and completeness Volume One begins with general discussion of portable spectrometer engineering before moving through the electromagnetic spectrum to cover x ray fluorescence XRF UV visible near infrared mid infrared and Raman spectroscopies Subsequent chapters examine microplasmas laser induced breakdown spectroscopy LIBS nuclear magnetic resonance NMR spectroscopy and a variety of portable mass spectrometry instrument types Featuring detailed chapters on DNA instrumentation and biological analyzers topics of intense interest in light of the global coronavirus pandemic this timely volume Provides comprehensive coverage of the principles and instruments central to portable spectroscopy Includes contributions by experienced professionals working in instrument companies universities research institutes the military and hazardous material teams Discusses special topics such as smartphone spectroscopy optical filter technology stand off detection and MEMS MOEMS technology Covers elemental spectroscopy optical molecular spectroscopy mass spectrometry and molecular and imaging technologies Portable Spectroscopy and Spectrometry Volume One is an indispensable resource for developers of portable instruments civilian and government purchasers and operators and teachers and students of portable spectroscopy When combined with Volume Two which focuses on the multitude of applications of portable instrumentation Portable Spectroscopy and Spectrometry provides the most thorough coverage of the field currently available

*Textbook of Forensic Science* Pankaj Shrivastava, Jose Antonio Lorente, Ankit Srivastava, Ashish Badiye, Neeti Kapoor, 2023-10-28 This textbook provides essential and fundamental information to modern forensics investigations It discusses criminalistics and crime scene aspects including investigation management collecting and packaging various types of physical evidence forwarding and chain of custody It presents fundamental principles ethics challenges and criticism of forensic sciences and reviews the crime typologies the correlates of crime criminology penology and victimology It provides a viewpoint on legal aspects including types of evidence the procedure in the court and scrutiny of the evidence and experts The book summarizes forensic serological evidences such as blood semen saliva milk tears sweat vaginal fluids urine and sweat It also provides an overview of forensic examination of different types of evidence and also includes comprehensive detailing of forensic ballistics including firearm classification bullet comparison and matching Further it explores the examinations of drugs chemicals explosives and petroleum products It focuses on the various aspects of forensic toxicology including the study of various poisons toxins associated signs and symptoms a fatal dose fatal period of poisons The book also emphasizes digital and cyber forensics including classification data recovery tools encryption and decryption methods image and video forensics It is a useful resource for graduate and post graduate students in the field of Forensic Science

*Forensic DNA Analysis* Elena Pilli, Andrea Berti, 2021-03-30 Forensic DNA Analysis Technological Development and Innovative Applications provides a fascinating overview of new and innovative technologies and current applications in forensic genetics Edited by two forensic experts with many years of forensic crime experience with the Italian police and with prestigious academic universities the volume takes an

interdisciplinary perspective the volume presents an introduction to genome polymorphisms discusses forensic genetic markers presents a variety of new methods and techniques in forensic genetics and looks at a selection of new technological innovations and inventions now available from commercial vendors The book is an important resource for scientists researchers and other experts in the field who will find it of interest for its exhaustive discussion of the most important technological innovations in forensic genetics For those newer to the field the volume will be an invaluable reference guide to the forensic world

*Introduction to Forensic Science* James T. Spencer, 2024-10-07

*Introduction to Forensic Science* The Science of Criminalistics is a textbook that takes a unique and holistic approach to forensic science This book focuses on exploring the underlying scientific concepts as presented at the introductory college and senior high school levels Chapters introduce readers to each of the important areas of forensic science grouping chapters together by discipline and following a logical progression and flow between chapters This systematically allows students to understand the fundamental scientific concepts recognize their various applications to the law and investigations and discern how each topic fits broadly within the context of forensic science The writing is accessible throughout maintaining students interest including both science and non science majors while inspiring them to learn more about the field Concepts are demonstrated with numerous case studies and full color illustrations that serve to emphasize the important ideas and issues related to a particular topic This approach underscores scientific understanding allowing the student to go beyond simple rote learning to develop deeper insights into the field regardless of their scientific background This book has been extensively classroom tested to provide the most comprehensive and up to date survey of various forensic disciplines and the current state of the science policies and best practices

**Key features** Presents a wholly new fresh approach to addressing a broad survey of techniques and evidentiary analyses in the field of forensic science All concepts and the underpinnings of forensic practice are explained in simple terms using understandable analogies and illustrations to further clarify concepts Introduces topics that other introductory texts fail to address including serology behavioral science forensic medicine and anthropology forensic ecology palynology zoology video analysis AI computer forensics and forensic engineering Highly illustrated with over 1 000 full color photographs drawings and diagrams to further highlight key concepts Suitable for both high school senior level instruction and two and four year university courses for majors non majors and criminal justice students enrolled in introductory forensic science classes

**Support Materials** including an Instructor's Manual with test bank and chapter PowerPoint lecture slides are available to professors with qualified course adoption

**Systems Thinking and Complexity Science** Kurt Anders Richardson, Kurt Antony Richardson, Wendy J. Gregory, Gerald Midgley, 2006

*Using Forensic DNA Evidence at Trial* Jane Moira Taupin, 2018-09-03

*Using Forensic DNA Evidence at Trial* A Case Study Approach covers the most common DNA analysis methods used in criminal trials today including STR techniques mitochondrial DNA and Y STRs It presents some novel techniques including familial testing and analyzing domestic animal hair that have been recently introduced in unique

cases each of which is outlined in detail It also illustrates special issues related to forensic DNA evidence by using court proceedings such as trials and appeals commissions of inquiry and government and laboratory reviews With forensic DNA analysis becoming increasingly important at trial the lively and sometimes bizarre cases presented in this book have been carefully chosen to highlight specific concepts methods and interpretations used in DNA analysis Sections throughout examine the nature of expertise with a special focus on the role of subjectivity in the interpretation of forensic DNA evidence emphasizing cognitive bias and extraneous context Using both convictions and exonerations as examples the book also discusses the strengths and limitations of DNA evidence and testing The book is written in an accessible manner for the non scientific reader such that criminal lawyers judges and forensic experts will all understand the nature of analysis and application of DNA evidence in a variety of court cases Extensive references including notable trial proceedings cross references of cases and specific forensic statistics round out the book and help to provide a complete understanding of forensic DNA analysis and its current usage in the courtroom

**Journal of Marine Archaeology** ,1997      **Encyclopedia**

**of Forensic and Legal Medicine: A-Co** Jason Payne-James,2005      Forensic DNA Typing: Principles, Applications and Advancements Pankaj Shrivastava,Hirak Ranjan Dash,Jose A. Lorente,Jahangir Imam,2020-12-11 The book explores the fundamental principles advances in forensic techniques and its application on forensic DNA analysis The book is divided into three modules the first module provides the historical prospect of forensic DNA typing and introduces fundamentals of forensic DNA typing methodology and technical advancements application of STRs and DNA databases for forensic DNA profile analysis Module 2 examines the problems and challenges encountered in extracting DNA and generating DNA profiles It provides information on the methods and the best practices for DNA isolation from forensic biological samples and human remains like ancient DNA DNA typing of skeletal remains and disaster victim identification the importance of DNA typing in human trafficking and various problems associated with capillary electrophoresis Module 3 emphasizes various technologies that are based on SNPs STRs namely Y STR X STR mitochondrial DNA profiling in forensic science Module 4 explores the application of non human forensic DNA typing of domestic animals wildlife forensics plant DNA fingerprinting and microbial forensics The last module discusses new areas and alternative methods in forensic DNA typing including Next Generation Sequencing and its utility in forensic science oral microbes and forensic DNA phenotyping Given its scope the book is a useful resource in the field of DNA fingerprinting for scientists forensic experts and students at the postgraduate level

Managing the Modern Herbarium Sheila C. Byers,Society for the Preservation of Natural History Collections,Royal Ontario Museum,1999 A joint project by The Society for Preservation of Natural History Collections The Royal Ontario Museum      *DNA* Lawrence Kobilinsky,Thomas Liotti,Jamel L. Oeser-Sweat,2004-11-11 Includes a Foreword by Dr James D Watson the co discoverer of the DNA double helix and Dr Jan A Witkowski From the Foreword by Drs Watson and Witkowski DNA Forensic and Legal Applications is a comprehensive and invaluable guide to the field covering topics ranging from



collecting samples in the field to presenting the complex results to a jury We are sure that it will play its part in promoting this most powerful tool in the forensic scientist s armamentarium DNA Forensic and Legal Applications covers the technology and laws related to DNA as well as the use of DNA evidence in the legal system This combination of science and law makes it the first comprehensive title of its kind and an appropriate reference for those with both elementary and advanced knowledge of the topic It draws together in one source information that would previously have required extensive research and reliance on experts to obtain offering both breadth and depth in a clear style without s acrificing scholarly goals With material from both scientific and legal areas DNA Forensic and Legal Applications covers the latest advances in technology It provides an ideal text for forensic scientists and students of forensic science analytical chemists lawyers judges police officers and detectives     **Current Law Index** ,2007     Research Centers Directory ,1960 Research institutes foundations centers bureaus laboratories experiment stations and other similar nonprofit facilities organizations and activities in the United States and Canada Entry gives identifying and descriptive information of staff and work Institutional research centers and subject indexes 5th ed 5491 entries 6th ed 6268 entries     Journal of Archaeological Science Society for Archaeological Sciences (U.S.),2002     **Stanford Bulletin** ,2004

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