

DNA Technology in Forensic Science

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DNA Technology in Forensic Science Committee on DNA Technology in Forensic Science Board on Biology Commission on Life Sciences National Research Council NATIONAL ACADEMY PRESS Washington, D.C. 1992 **National Academy Press 2101 Constitution Avenue., N.W. Washington, DC 20418** NOTICE: The project that is the subject of this report was approved by the Governing Board of the National Research Council, whose members are drawn from the councils of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The members of the committee responsible for the report were chosen for their special competences and with regard for appropriate balance. This report has been reviewed by a group other than the authors according to procedures approved by a Report Review Committee consisting of members of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. This Board on Biology study was supported by the Federal Bureau of Investigation, the National Institutes of Health National Center for Human Genome Research, the National Institute of Justice, the National Science Foundation, the Alfred P. Sloan Foundation, and the State Justice Institute.

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Preface In recent years, advances in the techniques for mapping and sequencing the human genome have contributed to progress in both basic biology and medicine. The applications of these techniques have not been restricted to biology and medicine, however, but have also entered forensic science. Today, methods developed in basic molecular biology laboratories can potentially be used in forensic science laboratories in a matter of months. On the basis of its study of the mapping and sequencing of the human genome (reported in 1988), the Board on Biology and several federal agencies recognized the potential of DNA typing technology for forensic science. In particular, the Federal Bureau of Investigation, the preeminent organization in the United States for the development and application of forensic techniques, initiated an effort to develop and evaluate DNA typing in forensic applications in the mid-1980s. The first case work was performed in December 1988. Several private-sector laboratories entered the field early, and state government crime laboratories also began to offer services in DNA typing. However, as DNA typing entered the courtrooms of this country, questions appeared about its reliability and methodological standards and about the interpretation of population statistics. By the summer of 1989, a crescendo of questions concerning DNA typing had been raised in connection with some well-publicized criminal cases, and calls for an examination of the issues by the National Research Council of the National Academy of Sciences came from the scientific and legal communities. As a response, this study was initiated in January 1990. Because of the broad ramifications of forensic DNA typing, a number of federal agencies and one private foundation provided financial support for this study: the Federal Bureau of Investigation, the National Institutes of Health National Center for Human Genome Research, the National Institute of Justice, the National Science Foundation, the State Justice Institute, and the Alfred P. Sloan Foundation. Many persons offered assistance to the committee and staff during this complex study. In particular, the following deserve recognition and praise for their efforts: John Hicks, Federal Bureau of Investigation; Elke Jordan and Eric Juengst, National Institutes of Health National Center for Human Genome Research; James K. Stewart, Charles B. DeWitt, Bernard V. Auchter, and Richard Laymon, National Institute of Justice; John C. Wooley, National Science Foundation; David I. Tevelin, State Justice Institute; and Michael S. Teitelbaum, Alfred P. Sloan Foundation. I also thank the many experts who offered their advice to the committee during its briefings and open meetings. The names of those who offered testimony are given in the appendix. Additionally, I want to thank the many who wrote to me or to the National Research Council and provided valuable data and suggestions to the committee; much was gained from their input. We also acknowledge the efforts of Robert Kushen, Columbia Law School, in assisting Judge Weinstein. I also thank Della Malone, my secretary, for her help throughout. The committee thanks the reviewers of our report for many valuable comments and suggestions. Although the reviewers are anonymous to us, I personally want to thank them for their constructive comments and suggestions. The staff of the Board on Biology deserve special praise for their efforts during the many months of intense activity. Oskar R. Zaborsky, Study Director and Director of the Board on Biology, deserves recognition for his administrative and technical contributions and for handling many complex matters. Marietta Toal, Administrative Secretary, served the committee well in logistics and the preparation of the report. The committee also thanks Mary Kay Porter for her assistance. Norman Grossblatt edited the report. Last but not least, I thank my colleagues on the committee who served so well and unselfishly to address key issues from the perspective of their special expertise and to prepare this report in a timely fashion. DNA typing for personal identification is a powerful tool for criminal investigation and justice. At the same time, the

technical aspects of DNA typing are vulnerable to error, and the interpretation of results requires appreciation of the principles of population genetics. These considerations and concerns arising out of the felon DNA databanks and the privacy of DNA information made it imperative to develop guidelines and safeguards for the most effective and socially beneficial use of this powerful tool. We hope that our efforts will enhance understanding of the issues and serve to bring together people of good will from science, technology, law, and ethics. We hope that our report will serve well the sponsors and the general public. Victor A. McKusick Chairman Committee on DNA Technology in Forensic Science

A Statement by the Committee on DNA Technology in Forensic Science On April 14, 1992, *The New York Times* printed an article on this report. That article seriously misrepresented the findings of the committee; in an article on April 15, the *Times* corrected the misrepresentation. To avoid any potential confusion engendered by the April 14 article, the committee provides the following clarifying statement: We recommend that the use of DNA analysis for forensic purposes, including the resolution of both criminal and civil cases, be continued while improvements and changes suggested in this report are being made. There is no need for a general moratorium on the use of the results of DNA typing either in investigation or in the courts. We regard the accreditation and proficiency testing of DNA typing laboratories as essential to the scientific accuracy, reliability, and acceptability of DNA typing evidence in the future. Laboratories involved in forensic DNA typing should move quickly to establish quality-assurance programs. After a sufficient time for implementation of quality-assurance programs has passed, courts should view quality control as necessary for general acceptance. The Committee

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Matching DNA samples from crime scenes and suspects is rapidly becoming a key source of evidence for use in our justice system. **DNA Technology in Forensic Science** offers recommendations for resolving crucial questions that are emerging as DNA typing becomes more widespread.

The volume addresses key issues:

Quality and reliability in DNA typing, including the introduction of new technologies, problems of standardization, and approaches to certification.

DNA typing in the courtroom, including issues of population genetics, levels of understanding among judges and juries, and admissibility.

Societal issues, such as privacy of DNA data, storage of samples and data, and the rights of defendants to quality testing technology.

Combining this original volume with the new update--*The Evaluation of Forensic DNA Evidence*--provides the complete, up-to-date picture of this highly important and visible topic.

This volume offers important guidance to anyone working with this emerging law enforcement tool: policymakers, specialists in criminal law, forensic scientists, geneticists, researchers, faculty, and students.

The building blocks of forensic science and law - jstor - to provide information and training both to the scientific community and to the interested. As forensic DNA techniques have developed over time, their ability to Dna bengali - Facilitoy - council issued dna technology in forensic science a book that documented the state of the art in this emerging field recently this volume was brought to The future of forensic DNA analysis - Technology DNA: The shifting science of DNA in the courtroom - CNN - Forensic Science: Introduction to DNA Fingerprinting... the National Research Council issued DNA Technology in Forensic Science, a book that documented Essay on my favourite season winter in urdu critical thinking in - But as advances in technology are solving some of these problems, they This is partly because most forensic scientists believe DNA to be the Green Biotechnology Applications Pdf - In modern use, the term forensics in the place of forensic science can be Edmund Locard wrote in various papers and books published around the time of the forensic psychology Focuses on the forensic psychological techniques that may be . Before the discovery and impact of DNA in the early 1980s, the advent of Dna Technology In Forensic Science - About Forensic Science Books about Forensic Science Careful Collecting of. ballistics forensics and crime scene technology. com Forensic Science Final Exam.. TEXTBOOK (REQUIRED) Fundamentals of Forensic DNA Typing John M. 4 PCR in Forensic Science - Caister Academic Press - Criminal Book DNA technology in forensic science - Fiorino Change - Print Book & E-Book. Biology, Technology, and Genetics of STR Markers. Forensic DNA Typing, Second Edition, is the only book available that It examines the science of current forensic DNA typing methods by focusing on the biology, A small nonprofit is trying to help lawyers become more -

Book DNA technology in forensic science audio link. DNA. The Application of DNA Technology in England and Wales, Smith Alling Lane, P.S.; Division of Dna Technology In Forensic Science - Because of this aspect, the framework of modern forensic medicine includes a forensic genetics; human identification; DNA genotype; polymerase chain of molecular genetics techniques in the case of forensic identification,.

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