

Applied Forensic Science and Law

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Foreword by

Justice (Retd.) Kurian Joseph

Former Judge, Supreme Court of India



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Applied Forensic Science and Law

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Contents

<i>Foreword</i>	<i>iii-iv</i>
<i>Preface</i>	<i>v</i>
<i>Acknowledgement</i>	<i>vi</i>
<i>Contributors</i>	<i>ix-x</i>
1. Evolution of Forensic Science and Criminology: Past v. Present	1-10
2. Written in the Genes: How DNA Technology is Breathing New Life Into Cold Cases in India	11-36
3. Regulating Genetic Justice: A Critical Analysis of the DNA Technology (Use and Application) Regulation Bill, 2019	37-50
4. From Crime Scene to Courtroom: The Complete Journey of Toxicological Evidence in the Pursuit of Justice	51-65
5. Digital and Cyber Forensics: Foundations, Tools, and Emerging Frontiers	66-92
6. Digital and Cyber Forensics	93-108
7. Decoding Deaths: The Role of Autopsy in Forensic Pathology	109-120
8. Psychological Forensics & Criminal Profiling	121-144
9. Psychological Forensics and Criminal Profiling: Ethical and Human Rights Concerns vis-à-vis India	145-156
10. The Interplay of Article 20(3) and Forensic Interrogation: Constitutional Safeguards and Judicial Scrutiny in India	157-167
11. Judicial Scrutiny of Forensic Evidence– A Case Study Approach	168-179
12. Strengthening Forensic Infrastructure in India- BNSS Compliance and the Need for Robust Evidence Storage Systems	180-189

13. Ethical and Human Rights Considerations in Forensic Practice	190-199
14. Ethical and Human Rights Considerations in Forensic Practice	200-210
15. Use of Artificial Intelligence in Forensic Science: The Next Generation Shift	211-219
16. Forensic Linguistic and Crime of Genocide: Special Reference to Jean Paul Akayesu Case Study	220-243
17. Cyber Forensics in Social Media Crimes and Trolling Investigations	244-255
<i>Case Study</i>	254-255
<i>Contributing Authors</i>	256-257

Contributors

1. **Evolution of Forensic Science and Criminology: Past v. Present**
Faiz Ayat Ansari
Kshamta Dubey
2. **Written in the Genes: How DNA Technology is Breathing New Life Into Cold Cases in India**
Dr. Nyatundo George Oruongo
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Kratika Verma
Kareena
4. **From Crime Scene to Courtroom: The Complete Journey of Toxicological Evidence in the Pursuit of Justice**
Dr. Gaurav Gupta
Dr. Wasim Ahmad
5. **Digital and Cyber Forensics: Foundations, Tools, and Emerging Frontiers**
Ria Ghosh
6. **Digital and Cyber Forensics**
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Sakshi
7. **Decoding Deaths: The Role of Autopsy in Forensic Pathology**
Chitra Shukla
Dr. G. Indira Priyadarsini
8. **Psychological Forensics & Criminal Profiling**
Dr. Satwik Chatterjee
Rashmi R
9. **Psychological Forensics and Criminal Profiling: Ethical and Human Rights Concerns vis-à-vis India**
Rishika Rani
Prachi Sundram
10. **The Interplay of Article 20(3) and Forensic Interrogation: Constitutional Safeguards and Judicial Scrutiny in India**
Sreekar Modali
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11. **Judicial Scrutiny of Forensic Evidence: A Case Study Approach**
Dr. Hepzibah Beulah. C
Ramnath V Rao
12. **Strengthening Forensic Infrastructure in India- BNSS Compliance and the Need for Robust Evidence Storage Systems**
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|---|---|
| 13. Ethical and Human Rights Considerations in Forensic Practice | <i>Aabil Husain</i>
<i>Dr. Maneesh Yadav</i> |
| 14. Ethical and Human Rights Considerations in Forensic Practice | <i>Prajwal Biswas</i>
<i>Dr. Satwik Chatterjee</i> |
| 15. Use of Artificial Intelligence in Forensic Science: The Next Generation Shift | <i>Dr. Raghunath Chakraborty</i> |
| 16. Forensic Linguistic and Crime of Genocide: Special Reference to Jean Paul Akayesu Case Study | <i>Dr. A. Vijayalakshmi</i> |
| 17. Cyber Forensics in Social Media Crimes and Trolling Investigations | <i>Falgu Mukati</i>
<i>Kaanchi Mukati</i> |

4

From Crime Scene to Courtroom: The Complete Journey of Toxicological Evidence in the Pursuit of Justice

Dr. Gaurav Gupta, Dr. Wasim Ahmad

Abstract

Forensic toxicology is a critical pillar in the administration of justice, offering scientific insights into the involvement of chemicals, drugs, and poisons in legal investigations. Despite its growing significance, the discipline still suffers from procedural inconsistencies and challenges in the interpretation and communication of toxicological evidence. This chapter addresses this research gap by providing a systematic exploration of the toxicological evidence chain from crime scene collection to courtroom testimony highlighting the challenges and solutions at each stage. The objective of this chapter is to outline the scientific, procedural, and legal aspects involved in forensic toxicology, with a focus on maintaining evidence integrity, employing advanced analytical techniques, and effectively communicating findings in legal settings. The chapter uses a doctrinal research methodology supported by descriptive analysis of laboratory protocols, case law references, and standard forensic guidelines. Key findings include the importance of meticulous sample collection and preservation, the necessity of a robust chain of custody, and the role of confirmatory techniques such as GC-MS and LC-MS/MS in ensuring evidentiary reliability. Further, the chapter explores the complexities in interpreting toxicological results, including factors such as metabolism, post-mortem redistribution, and poly-pharmacy. The report writing process is evaluated, emphasizing scientific clarity, objectivity, and exclusion of speculative assertions.

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Dr. Govind Prasad Goyal is a seasoned academician and an accomplished scholar with a distinguished career in legal and interdisciplinary research. With numerous research publications in Scopus- indexed journals, ABDC-listed journals, and Web of Science, he has made significant contributions to contemporary academic discourse. He is the author of nine books and serves as an editor for several prestigious international publishers, including Cambridge Scholars Publishing, Routledge (Taylor & Francis), and Bentham Science, reflecting his deep expertise and editorial excellence. A committed innovator, Dr. Goyal has also been recognized for his creative and practical contributions through multiple national and international patents, demonstrating his visionary approach toward research, education, and technology-driven solutions. In his current role as Dean, Students' Welfare at IMS Law College, Noida, he continues to inspire students and faculty alike through his leadership, innovation, and dedication to academic excellence.



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