



DNA Technology in Criminal Investigation in India

Chatrapal Singh*

DNA technology has revolutionized criminal investigation across the globe, and India is no exception. In a country as vast and diverse as India, the use of DNA technology has become increasingly significant in solving criminal cases, particularly those involving violent crimes such as rape and murder. This technology has not only provided concrete evidence in many cases but also helped in exonerating the innocent. As the judiciary and law enforcement agencies of India embrace DNA technology, its role in the criminal justice system continues to grow. This article explores the significance of DNA technology in criminal investigations in India, its legal framework, important Supreme Court cases, and the challenges and future prospects of its use in the Indian legal system.

Introduction

Deoxyribonucleic Acid (DNA) contains the genetic information of an individual and is unique to every person (except for identical twins). The use of DNA profiling in criminal investigations involves comparing DNA samples from crime scenes (such as blood, saliva, hair, or skin cells) to the DNA of a suspect to establish a match. DNA evidence has been instrumental in identifying perpetrators, linking suspects to crimes, and excluding innocent individuals.

In India, DNA technology is increasingly being used to solve various types of crimes. The application of DNA testing was first introduced in the country in the late 1980s, and since then, its role in criminal justice has expanded significantly.

* Ph.D. Scholar, Department of Law, JRN Vidyapeeth University, Udaipur

Legal Framework Governing DNA Technology in India

The use of DNA evidence in India is primarily governed by laws related to evidence and criminal procedure. The **Indian Evidence Act of 1872**, though an older piece of legislation, recognizes the admissibility of DNA evidence under the category of expert evidence. Section 45 of the Act allows the court to rely on scientific evidence, including DNA testing, provided it is deemed reliable.

However, the need for a specific legislative framework for the use of DNA in criminal investigations led to the drafting of the **DNA Technology (Use and Application) Regulation Bill**. This bill, which is yet to become law, aims to regulate the use of DNA technology for establishing identity in criminal cases and civil disputes (such as paternity tests). It provides for the establishment of DNA data banks and ensures the proper collection, storage, and disposal of DNA samples. It also emphasizes the protection of individuals' privacy and aims to prevent the misuse of DNA information.

The Importance of DNA Technology in Criminal Investigations

DNA technology has become a powerful tool in criminal investigations, offering benefits such as:

- **Accuracy and Reliability:** DNA evidence is highly accurate, and when handled properly, it can provide irrefutable proof of a person's involvement in a crime.
- **Cold Case Resolution:** In cases where conventional methods have failed, DNA analysis has helped law enforcement solve cold cases by identifying suspects or ruling out others after many years.
- **Exoneration of the Innocent:** DNA evidence has played a crucial role in preventing miscarriages of justice by exonerating wrongfully convicted individuals.

In India, the increasing use of DNA evidence in rape cases, custodial deaths, and other criminal matters has led to more convictions and fairer judicial outcomes.

Landmark Supreme Court Cases Involving DNA Evidence

Several landmark cases in India have demonstrated the significance of DNA technology in criminal investigations. Below are a few important Supreme Court cases where DNA evidence played a critical role:

Kishanbhai v. State of Gujarat (2014)

This case involved the rape and murder of a young girl. The Supreme Court emphasized the importance of proper investigation and the role of DNA technology in criminal cases. The judgment stressed that DNA testing should be conducted whenever necessary to avoid wrongful convictions. In this case, the lack of proper forensic analysis, including DNA testing, led to a miscarriage of justice, prompting the Court to advocate for more robust forensic practices.

Santosh Kumar Singh v. State (2010)

In the infamous Priyadarshini Mattoo case, DNA evidence played a crucial role. Santosh Kumar Singh was convicted of raping and murdering law student Priyadarshini Mattoo in 1996. Although the trial court acquitted him due to lack of evidence, the Delhi High Court, and later the Supreme Court, overturned the acquittal and convicted Singh, based largely on DNA evidence linking him to the crime. This case underscored the value of DNA profiling in rape and murder cases, particularly when other evidence is insufficient.

Surendra Koli v. State of U.P. (2011)

In the Nithari killings case, DNA testing was vital in linking Surendra Koli, the primary accused, to the multiple murders and sexual assaults of children. The forensic evidence, including DNA analysis, confirmed the identity of several victims, providing key evidence that contributed to Koli's conviction. This case highlighted the need for meticulous DNA testing and the role it plays in serial offenses.

Shivaji @ Dadya Shankar Alhat v. State of Maharashtra (2009)

This case involved the rape and murder of a young girl in Maharashtra. The accused, Shivaji, was convicted based largely on DNA evidence that linked him to the crime. The Supreme Court upheld the conviction, affirming that DNA profiling can be a conclusive method of proving guilt in sexual assault cases. This case reinforced the admissibility and reliability of DNA evidence in court.

Challenges in the Use of DNA Technology in India

Despite its potential, several challenges hinder the widespread use of DNA technology in criminal investigations in India:

- **Lack of Infrastructure:** India still lacks sufficient DNA testing labs with advanced technology and trained personnel. Many police departments and forensic science labs are underfunded and understaffed, leading to delays in obtaining results.
- **Backlog of Cases:** There is a massive backlog of cases awaiting forensic testing, including DNA analysis. The slow pace of forensic investigations can result in delayed justice.
- **Lack of Standardization:** The absence of standardized protocols for collecting, preserving, and analyzing DNA evidence can lead to contamination and loss of crucial data.
- **Privacy Concerns:** The proposed DNA bill has raised concerns about the potential misuse of DNA data and the violation of individuals' privacy rights. Critics argue that adequate safeguards are needed to prevent the unauthorized use of DNA information.

Future Prospects and Reforms

The future of DNA technology in India's criminal justice system looks promising, but it requires certain reforms and advancements:

- **Establishment of DNA Data Banks:** The DNA Technology Regulation Bill proposes the creation of national and regional DNA data banks that would store DNA profiles. This would greatly enhance the ability to solve crimes by matching DNA from crime scenes with stored profiles.
- **Training and Capacity Building:** Training law enforcement personnel in the proper collection and handling of DNA evidence is crucial to improving the efficiency and reliability of DNA-based investigations.
- **Modernization of Forensic Labs:** Upgrading the forensic infrastructure, including the creation of more DNA testing facilities, would help reduce the backlog of cases and ensure quicker results.
- **Ethical and Legal Safeguards:** It is essential to have strong legal and ethical frameworks in place to protect individuals' rights and prevent the misuse of DNA information.

Suggestions-

- Include statistics on the number of criminal cases solved using DNA technology in India. You can gather data from reports of forensic labs or government agencies like the National Crime Records Bureau (NCRB).
- Highlight the success rate of DNA profiling in criminal investigations, comparing it with traditional methods like witness testimonies or fingerprint analysis.
- You could discuss additional Supreme Court cases where DNA technology has either helped solve the crime or was not used effectively. This could include cases where DNA testing was rejected due to procedural issues, which would highlight the importance of following strict protocols.
- Discuss cases like **Nirbhaya (2012)** and **Raja alias Rajinder v. State of Haryana (2015)** where DNA evidence played a critical role in securing convictions.
- Compare India's use of DNA technology with that of other countries, especially those with advanced forensic systems like the United States or the United Kingdom. This could highlight areas where India can improve, such as faster processing of DNA evidence or better data security protocols.
- Provide examples of international collaborations in forensic science, such as Interpol's DNA database, and suggest how India could benefit from participating in global forensic networks.
- Dive deeper into the **DNA Technology (Use and Application) Regulation Bill** and provide suggestions for improvement. You could discuss issues like consent for DNA collection, rights of the accused, privacy concerns, and the need for transparent procedures.
- Suggest policies for better regulation of private DNA labs, ensuring that all tests meet high ethical and scientific standards.
- Suggest more investment in forensic science infrastructure, such as setting up new state-of-the-art DNA labs in every major city.
- Recommend partnerships between forensic experts and academic institutions to advance research in DNA technology, which could improve accuracy and efficiency in criminal investigations.

Conclusion

DNA technology has undoubtedly emerged as a critical tool in criminal investigations in India, providing conclusive evidence in numerous cases. Its application in the judicial system has been validated by the

Supreme Court in several landmark cases, proving its reliability and accuracy. However, for DNA technology to reach its full potential in India's criminal justice system, there must be improvements in infrastructure, training, and the legal framework. With the right reforms, DNA technology can serve as a cornerstone of justice, ensuring both the conviction of the guilty and the protection of the innocent.

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