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## A Study on the Impact of DNA Technology on Investigations

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### ARTICLE DETAILS

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Research Paper

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### ABSTRACT

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*DNA technology has transformed criminal investigation across the globe including India. 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. 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 such as blood, saliva, hair or skin cells from crime scenes 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 investigation and justice has expanded significantly. This article explores the significance of DNA technology in investigations.*

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### Introduction

India has been impacted by the widespread adoption of DNA technology in investigations. Even in a diverse and large country like India, DNA evidence has become increasingly crucial to the final verdict in murder and rape cases. This technology has helped clear innocent people's names and provided concrete evidence in several cases. India's courts and police departments are increasingly using DNA technology



as part of the country's criminal justice system. A unique DNA holds the genetic information of every individual. In investigations, DNA profiling is the process of matching a suspect's DNA to samples such as blood, saliva, hair, or skin cells collected from crime scenes in order to find a match. Genomic evidence has been vital in identifying offenders, linking suspects to crimes and excluding innocent individuals. An increasing number of crimes in India are being solved by using DNA technology. The criminal justice system has grown to rely on DNA testing since its introduction in the late 1980s. According to the legal framework in India, DNA evidence is mostly governed by regulations regarding criminal procedure and evidence. This article explores into the legal aspects, major opinions from the Supreme Court, DNA technology's challenges and its significance in investigations in the country.

## About DNA

Scientists Francis H. C. Crick and James D. Watson initially described DNA in 1953. DNA is sometimes called the genetic blueprint or the building block of life. In addition to demonstrating that DNA is the material that comprises the genetic code of organisms, Crick and Watson found DNA's double-helix structure, which is like a twisted ladder. The blueprint of a living thing's DNA dictates how it will grow and evolve. The DNA of every single cell in a human body is identical. This includes skin cells, sperm and blood cells. With the exception of identical twins, no two individuals have the exact same genetic code.

As part of a criminal investigation DNA analysis involves dissecting a suspect's DNA molecule separating its specific segments and then quantifying them using scientific equipment. The next step is to compare the suspect's DNA profile with a physical evidence sample to determine if they match. If there is a clear non-match, the suspect could be removed from further examination. If a match is detected, a statistical calculation is made to determine the likelihood that the physical evidence sample was obtained from an individual with the same DNA profile as the suspect. Juries rely on these statistical findings when deciding whether an accused person is guilty or not. DNA testing has recently become standard procedure for establishing guilt in court.

It is also used in civil processes particularly when trying to figure out who is the father. When a known person's DNA matches that of the evidence at the crime scene they are included as a potential source of evidence. Someone in this group might be a suspect or a victim. DNA profile both victim's and suspect's does not match the DNA profile obtained from the crime scene they are excluded as a potential donor of the evidence. The results were inconclusive meaning that DNA testing could not



pinpoint an individual as the biological evidence's progenitor. Normal people's questions regarding DNA testing. The police hold me for a crime, do they have the right to ask for a DNA sample from me to use in their investigation.

The incorporation of DNA testing into the legal system has forced numerous developed nations to revise their legislation. The Indian Evidence Act has provisions that the laws of 1872, including section 112 which determines who the legal parents of a child are provide that a child born to a mother during a valid marriage to a man and whose mother is still unmarried within two hundred and eighty days after the marriage ends is considered to be the child of the man unless proven differently<sup>1</sup>. Modern scientific procedures are once again not addressed by any particular paragraph. In civil litigation, DNA testing is essential for determining paternity of a kid. In criminal court maintenance proceedings under Section 125 of the Cr.P.C this proof is especially necessary in civil and criminal cases<sup>2</sup>.

### **Reliability and Accuracy**

DNA evidence can be so precise that it can establish guilt beyond a shadow of a doubt if handled properly. DNA analysis has helped law enforcement solve cold cases when other methods have failed by identifying suspects or ruling out others after many years. DNA evidence has played a pivotal role in averting injustices by acquitting wrongfully convicted individuals. In recent years, DNA evidence has been increasingly popular in India's rape and custodial death cases leading to more convictions and more fair court verdicts. Several landmark cases in India's Supreme Court have used DNA evidence to highlight the significance of this technology in criminal investigations.

### **Court cases involving DNA evidence**

State of Gujarat v. Kishanbhai<sup>3</sup> in which a young girl was raped and murdered Both the importance of a comprehensive investigation and the use of DNA testing in criminal cases were emphasised by the Supreme Court. In order to avoid wrongful convictions, the ruling underlined that DNA testing should be conducted whenever necessary. Inadequate forensic investigation including DNA testing, led to a miscarriage of justice in this case which is why the Court is in favour of stricter forensic standards. Crucial DNA evidence was presented in the infamous Priyadarshini Mattoo case in State v. Santosh Kumar Singh<sup>4</sup>.

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<sup>1</sup> Sec-112, The Indian Evidence Act, 1872

<sup>2</sup> Sec- 125, The Criminal procedure code, 1973.

<sup>3</sup> AIR 2014 SC (Criminal) 540.

<sup>4</sup> SC, Criminal Appeal no. 87 of 2007.



Santosh Kumar Singh was convicted of the 1996 rape and murder of law student Priyadarshini Mattoo. Although the trial court had cleared Singh for lack of evidence the Delhi High Court and then the Supreme Court overturned his acquittal and pronounced him guilty. This was mostly due to DNA evidence that linked him to the crime. This case demonstrated the significance of DNA profiling in homicide and rape investigations, particularly in situations where other forms of evidence are inadequate. In the case of *State of U.P. v. Surendra Koli*<sup>5</sup> DNA testing was important in linking the primary suspect, Surendra Koli, to the several sexual assaults and child killings that occurred during the Nithari incidents. Important forensic evidence, including DNA tests, established the names of additional victims and provided conclusive proof of Koli's guilt. This case highlighted the importance of comprehensive DNA testing and its link to serial offences. This case involves the rape and murder of a teenage girl from Maharashtra Court upheld the lower court's decision, maintaining that DNA profiling is a valid tool for determining guilt in sexual assault cases. This decision upheld the validity and admission of DNA evidence in court. Problems with DNA Technology in India despite its promise, DNA technology has encountered some obstacles in its widespread use in criminal investigations in India.

### Constitutional provision

The development of DNA technology several fundamental human rights like the "Right to privacy"<sup>6</sup> and the "Right against self-incrimination"<sup>7</sup>, have come under severe criticism. This is the most important reason why judges don't always believe DNA evidence. Article 21, which guarantees the right to life and personal liberty, also covers the right to privacy in the Indian Constitution<sup>8</sup>. Another protection afforded to accused individuals in criminal proceedings by Article 20(3)<sup>9</sup> is the right against self-incrimination, which prevents them from disclosing any information that could establish their guilt or implicate others. The right to one's own life and freedom is not an inalienable one as the Supreme Court has held time and time again. It is necessary to limit a fundamental right when there is a compelling public interest to do so, according to the Supreme Court's ruling in *Govind Singh v. State of Madhya Pradesh*<sup>10</sup>. In the case of *Khark Singh v. State of Uttar Pradesh*<sup>11</sup>, the Supreme Court determined that the right to privacy is not

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<sup>5</sup> SC, Criminal appeal no. 2227 OF 2010.

<sup>6</sup> 1978 AIR 597,

<sup>7</sup> Art-20(3), The Indian Constitution, 1950.

<sup>8</sup> Art-21, The Indian Constitution, 1950.

<sup>9</sup> Art-20(3), The Indian Constitution, 1950.

<sup>10</sup> 1975 AIR 1378.

<sup>11</sup> 1963 AIR 1295



guaranteed by our Constitution. The right to life and personal liberty guaranteed by our Indian constitutions are not absolute and may be qualified by subsequent opinions of the Supreme Court. This has been made very clear in a number of cases. It is upon this basis that the laws concerning medical examination the right to life and personal liberty are upheld by the Supreme Court. To make effective use of modern technology, India urgently needs a specific law that would set the regulations for DNA testing. In a decision the Supreme Court chose not to reverse the Delhi High Court's decision that long-serving Congress leader N.D.Tiwary. The involvement of Tiwari in the DNA test is essential from the standpoint of the admissibility of such evidence. Rohit Shekhar has claimed paternity of N.D. Tiwari. For fear of public shame and a violation of his right to privacy, Tiwari is unwilling to take the test. This argument was rejected by the Supreme Court which maintained that humiliation serves no purpose when test results are kept secret and sealed in an envelope. Additionally, the Supreme Court emphasised that young men should not be left without any means of redress in order to ensure that they receive justice. It will be interesting to see how the Indian courts rule on the admissibility of DNA technology.

## Legal Aspects

There are no specific guidelines for dealing with issues related to forensic science, technology, or science in either the Code of Criminal Procedure of 1973 or the Indian Evidenced Act of 1872. It is very difficult for an investigating officer to collect evidence that utilises modern technologies to establish the guilt of the accused in the absence of such a provision. As Per Section 53<sup>12</sup> of the Code of Criminal Procedure, a law enforcement official may, in an honest effort to further the investigation seek the opinion of a medical expert. But it doesn't let the complainant collect evidence like blood or semen to bring criminal charges. Both the rape victim and the accused are entitled to medical examinations. The validity of these evidences, however, has been up for debate so long as the views of the Supreme Court and several High Courts in separate decisions have continued to be conflicting. Courts may reject DNA evidence owing to constitutional constraints, public policy considerations or legal constraints even when courts do not contest the scientific validity and conclusiveness of DNA testing. The Indian Evidence Act of 1872 recognises DNA evidence as admissible expert testimony however it is an older piece of legislation. According to Section 45 of the Act the court can consider credible scientific evidence such as DNA testing in its decisions<sup>13</sup>. The need for a clear legal framework surrounding the use of DNA in criminal investigations

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<sup>12</sup> Sec-53, The Criminal procedure code, 1973.

<sup>13</sup> The Indian Evidence Act, 1872.



led to the draughting of the **DNA Technology (Use and Application) Regulation Bill**<sup>14</sup>. This bill aims to regulate the use of DNA evidence in civil and criminal proceedings but it has not yet been enacted into law. It permits the establishment of DNA data banks and ensures the correct collection, storage, and disposal of DNA samples. Emphasising the issue of safeguarding individuals' privacy, it aims to put an end to the improper use of DNA data. Because of these and other benefits, DNA technology has become an effective tool in forensic science and law enforcement investigations.

Genetic fingerprinting is one way to identify an individual at the molecular level. Recent years have seen a rise in the utilisation of DNA evidence in investigations. Difficult crimes including rape, murder, and murder with rape have been apprehended by law enforcement agencies through the application of DNA testing. Immigration problems can now be resolved even when the father is not available. For the express goal of identifying criminals, certain countries have set up computerised DNA databases. Because no two individuals have the same genetic code apart from identical twins, DNA can be a powerful instrument in scientific inquiry. Another way of looking at it is that different parts of the cell have different DNA building blocks, which means that every person's DNA is different. The Indian Evidence Act of 1872 and the Code of Criminal Procedure of 1973 do not have any specific regulations for forensic scientific matters, notwithstanding DNA's undeniable importance in criminal investigation scenarios such as murder, rape, disputed paternity, man-made disasters etc. The study delves into the science of DNA identification and how it is utilised in investigations and proceedings including trials, appeals and postconviction actions. India as an example, it lists the main pros and cons of DNA identification as it is being used more and more in criminal justice.

## **The Conclusion and Recommendation**

There has been a recent uptick in the use of DNA evidence in Indian criminal investigations. Authorities have been able to solve more complicated crimes and identify criminals with the use of DNA testing. But DNA evidence has proven that many people in prison are innocent. The necessary requirements must be provided by the government and the Cr. P. C must be amended. The accused or suspect must submit a DNA sample to the investigating authorities. A DNA database that takes into account geographical, anthropological, and ethnic elements should be set up by the government without delay. Integral to the DNA testing process is establishing transparency and accountability while also striking a balance between public interest and individual rights. Many law enforcement agencies and forensic science laboratories do

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<sup>14</sup> The DNA Technology (Use and Application) Regulation Bill, 2018.



not have sufficient resources, which causes results to be postponed. Forensic testing is still needed for a large number of cases some of which involve DNA analysis. If forensic investigations take too long, justice may be postponed. The absence of defined protocols for collecting, storing, and analysing DNA evidence raises concerns about contamination and the potential loss of crucial data. The proposed DNA bill has sparked debate over the potential misuse of DNA data and the invasion of people's right to privacy. Opponents argue that in order to prevent the exploitation of DNA data, adequate safeguards are necessary. Improvements and changes are necessary, but DNA technology seems to have a promising future in India's penal justice system. The DNA Technology Regulation Bill calls for the establishment of DNA data banks at the national and regional levels to store DNA profiles. This will greatly enhance the capacity to solve crimes by matching stored profiles with DNA from crime scenes. Law enforcement officials should receive training on how to correctly collect and handle DNA evidence in order to increase the efficacy and reliability of DNA-based investigations.