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THE ROLE OF DNA TECHNOLOGY IN THE ADMINISTRATION OF JUSTICE IN INDIA: AN ANALYSIS

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ABSTRACT

Assistant technology is helps disable child to adjust with environment. It has improves disable children knowledge and skills. It reduces difficulties of children with learning disabled. Assistive technology makes learning effective for students with disabilities. Assistive technology helps identify students with disabilities. Assistive technologies teach according to their abilities. Assistive technology helps them grow and development. Students with disabilities receive information with the help of assistive technology. Assistive technology makes content easier to convey and especially accessible to students with disabilities. Assistive technology provides more opportunities for children to engage in activities which are important for healthy child development. It has play important role to increase confidence level of disabled children. Assistant technology helps to overcome obstacles and living independently. The integration of DNA technology in the criminal justice system has emerged as one of the most transformative advancements in modern forensic science. In India, the application of DNA evidence has gradually evolved to become a crucial tool in the administration of justice, assisting in criminal investigations, establishing the identity of individuals, and aiding in the resolution of paternity disputes. DNA technology, which was once a foreign concept to the Indian legal system, now plays a vital role in improving the accuracy, efficiency, and fairness of legal proceedings. This article aims to understand DNA evidence, its importance in ensuring Justice and the

various legal challenges involved in introducing such evidence before court. The research aims to also determine the need to develop and amend criminal legislation to include DNA evidence and the need of a DNA database to ensure immediate identification of criminals.

Introduction:

DNA (Deoxyribonucleic Acid) is a molecular blueprint of all living organisms, and its uniqueness makes it an invaluable tool in the criminal justice system. Each individual's DNA, except for identical twins, is unique, making it an infallible marker of identity. The ability to link a suspect to a crime scene, exonerate the innocent, and determine familial relationships has revolutionized forensic investigations. Previously, courts relied upon traditional forms of evidence collected from the crime scene or presented before the court. Such evidences are linked with accused persons and accordingly they are convicted, upon further investigation. In most situations this method has proven to be effective. Although, this has also led to the conviction of innocent persons, in certain cases where the alibi of the accused is against his/her favour and several criminals are even released due to lack of sufficient evidence. Hence, there is a need to acquire an efficient system to ensure that the actual offenders are punished for the crime committed by them and for the protection of the society from harm[1]. Further, this may also help for the exoneration of innocent persons who have been wrongfully convicted for the crime. Forensic Evidences play an important role in such circumstances. These evidences tend to be highly accurate and often helps to identify the culprits through the evidence left by him/her. DNA or Deoxyribonucleic Acid is a unique biological blueprint present in human beings. This component is present within all cells of the human body and can be used to identify a person. Two individuals cannot have the same DNA with the exception of identical twins. In criminal investigations, DNA is collected from any cell, hair strands, blood, tissues, semen or bodily fluids unintentionally left behind by the perpetrators of the crime at the scenes of crime and they are identified through a process known as DNA profiling. With such developments, criminal investigations have recently leaned upon DNA evidences acquired from the crime scene to connect the offenders to the crime. Forensic data has even been used to solve several crimes in countries like USA and UK. However, the application of this data has raised issues on the human rights of the accused against self-incrimination and

[1] Bhatt, J. N. (2003). A profile of forensic science in juristic journey. *SCC Journal*, *8*, 25–31.

the right to privacy. This often raises conflict as to whether the evidentiary value of such DNA evidences is significant so as to hamper the basic rights provided by the constitution.

Over the years, DNA evidence has become increasingly important in criminal investigations. Any bodily cell that is inadvertently left at the crime scene might be used to gather it. In order to identify the criminal, forensic specialists must check and gather evidence, separate the DNA, and do DNA profiling analysis. Such evidence is quite accurate and can be used to establish the guilt or innocence of condemned individuals who may later be found not guilty. Convicts in murder or sexual assault cases are typically identified using DNA evidence. As demonstrated in the **Priyadarshini Mattoo case**[2], semen samples taken from the victim's body may be compared to those of the accused in sexual assault and rape cases to ascertain whether or not the accused committed the crime[3]. As demonstrated in the 1992 **Rajiv Gandhi murder**[4], when the remains of the prime minister and the perpetrator were identified by DNA analysis after the explosion seriously injured the bodies, it may also be used to identify victims or suspects through mangled portions. DNA evidence can also be used to determine a child's maternity or paternity. As previously said, a person's DNA is their distinct composition, which is passed down from their parents. The relationship between a parent and kid may thus be demonstrated via it.

A paternity issue involving support payments under Section 125 of the CrPC was at the center of the **Gautama Khaddu v. State of West Bengal case**[5]. Criminals who have committed crimes can be broadly identified using DNA evidence. These pieces of evidence can also establish whether the accused individual actually committed the crime or participated in its conduct. It is carried out by comparing a sample taken from the crime scene with one taken from the accused. In order to demonstrate the tie between the sponsor and the beneficiary for immigration reasons, DNA evidence is frequently utilized to establish familial relationships. In the Leicestershire case of Colin Pitchfork[6], DNA profiling was used for the first time. Two women were sexually attacked and then killed in 1983 and 1986. Based on the assumption that the two murders were carried out similarly, Sir Alec Jeffreys, the creator of the DNA profiling technique, was invited to do a DNA profile study of the samples recovered from the victims'

[2] Santosh Kumar Singh v. State through CBI, (2010) 9 SCC 747.

[3] Jakovski, Z., Jankova, R., Duma, A., Janeska, B., Pavlovski, G., & Marjanovic, D. (2013). Forensic approach to analyzing rape cases. *Forensic Science International: Genetics Supplement Series, 4*(1), 45–46. https://doi.org/10.1016/j.fsigss.2013.10.023

[4] Nalini v. Union of India, *Criminal Appeal Nos. 321–325 of 1998*.

[5] AIR 1993 SC 2295.

[6] R v. Pitchfork, [2009] EWCA Crim 963.

corpses. Semen samples taken from the victims' bodies were found to be similar upon investigation, suggesting that a single individual was responsible for both killings. Additionally, the findings showed that Richard Buckland, the primary suspect, was not the killer in this instance. He became the first person to be freed based on DNA evidence and was ultimately found not guilty.

Everyone who resided in the neighbourhood was then invited to submit samples for testing, but even after looking over 5000 samples, the results were in vain. Subsequently, a woman reported overhearing a man who claimed to have given a sample on behalf of his buddy Colin Pitchfork. Colin Pitchfork was ultimately found guilty of killing both ladies when his sample was tested and found to match the evidence gathered from the victims' corpses. DNA Evidence's Limitations DNA evidence does not reveal the criminal's men's rea; it may only be used to prove that the accused was present or engaged in the crime. Nonetheless, it facilitates the investigation by removing potential suspects, particularly in light of the improvements in criminal activity. Additionally, DNA data from samples of poor quality or those polluted by improper handling or exposure to biological stimuli frequently tends to be tainted and cannot be trusted to yield reliable findings[7]. Given that the samples must be meticulously stored and free of contamination from the crime scene, this is a crucial component of DNA profiling. Additionally, DNA evidence cannot be used exclusively to convict an accused individual since it may inadvertently be lost before the crime is committed. In order to demonstrate that the accused did not participate in the commission of the crime, it is crucial to support such evidence with conventional evidence that already exists. Another challenge for DNA evidence is bone marrow transplantation, which is likely to reveal variations in the subject's DNA[8].

Legal ramifications and difficulties with DNA evidence:

One of the primary questions that comes up when analysing DNA evidence is whether or not accused individuals can be coerced into submitting samples for DNA analysis, as this would be against their right to privacy under Article 21 and their right against self-incrimination under Article 20(3). Even those who are charged have the right to cite these articles as they pertain to their fundamental rights. No one may be forced to testify against themselves in accordance with Article 20(3). This is to make sure that involuntary

[7] Singh, S. C. (2011). DNA profiling and the forensic use of DNA evidence in criminal proceedings. *Journal of the Indian Law Institute, 53*(2), 195–226.

[8] Srivastava, A., Harshey, A., Das, T., Kumar, A., Yadav, M. M., & Shrivastava, P. (2022). Impact of DNA evidence in criminal justice system: Indian legislative perspectives. *Egyptian Journal of Forensic Sciences, 12*, 1–12. https://doi.org/10.1186/s41935-022-00309-y

and coerced admissions are avoided in court. In **Ramalal Bhogilal Shah v. V.K. Guha**[9], the Supreme Court ruled that although Article 20(3) protects against being forced to testify against oneself, a DNA test may be conducted with the court's permission and oversight if necessary. The case of **State of Bombay v. Khathikalu Oghad**[10] established that becoming a witness against oneself does not include giving samples or performing medical examinations. This was also evident in **Selvi v. State of Karnataka**[11], where the court determined that DNA testing does not violate the constitutional guarantee included in Article 20(3) because it can be an essential instrument in connecting accused individuals to criminal activities. According to Article 21's right to privacy, no one's right to life and personal freedom may be taken away from them unless it is done in compliance with legally mandated processes. The Supreme Court ruled in the seminal case of **Menaka Gandhi v. Union of India**[12] that Article 21 might be disregarded in two situations: either a statute is legitimate, or a method is fair, reasonable, and sanctioned by the law. Additionally, it was decided that it was not an absolute right[13]. Thus, the primary question is whether DNA evidence has such high evidential value that it ignores the fundamental rights guaranteed to the accused by the constitution. Here, the fundamental tenets of the criminal justice system—that is, to guarantee that the guilty are held accountable, the innocent are released, and the impacted are given justice—play a significant role. The victim may be the lone witness in violent crimes like rape, murder, etc., or witnesses may provide false testimony or choose not to disclose the truth out of fear inflicted by pressure or threats from the perpetrators[14]. To safeguard the interests of the impacted parties in such circumstances, it is imperative that reliable proof be presented[15].

This topic was covered in the case of **Thongorani Alias K. Damayanti v. State of Orissa and Ors.**[16] The Orissa High Court ruled that the public interest and the accused's rights under Article 20(3) and Article 21 of the Constitution must be balanced before a court orders DNA testing. The court must also take into account the seriousness of the offense, the extent to which the accused contributed to the crime, the accused's age and health, and if any other evidence is available to demonstrate the accused's involvement

[9] 1973 SCC (1) 696.
[10] 1961 AIR 1808.
[11] (2010) 7 SCC 263.
[12] (1978) 1 SCC 248.
[13] Sharda v. Dharmpal, (2003) 4 SCC 493
[14] Chhikara, S. (2020). Role of forensic science in criminal investigation. *International Journal of Legal Science and Innovation, 2*(1), 793–797.
[15] Ara, T. (2022). DNA profiling in criminal justice system of India: Relevance and importance. *International Journal for Research Trends and Innovation, 7*(8), 117–121.
[16] 2004 CriLJ 4003.

in the crime or not.The accused's grounds for refusing to agree to such DNA testing should be assessed by the court. Therefore, as long as the rights of the accused and the interests of society are balanced, such rights might be disregarded. The Indian Evidence Act of 1872 makes no mention of DNA evidence. Expert testimony, which is covered in Section 45, can be used to recognize and assess evidence that calls for specialized knowledge. The validity of children in cases where there is no discernible relationship between the husband and wife is covered in Section 112.

In **Kamti Devi v. Poshiram**[17]**,** this was noted. In the **N.D. Tiwari case**[18]**,** another historic ruling was rendered. In this instance, a young man claimed to be N.D. Tiwari's son and asked the court to establish his paternity. A court ruling required the lawmaker to submit to DNA testing, but he refused, claiming it would violate his privacy and humiliate him in public. The Supreme Court ordered the test to be administered and ruled that the findings would not be made public and would only be used to prove the young man's paternity since he has the right to justice. The outcome ultimately determined that the man was, in fact, N.D. Tiwari's sonf[19].

DNA evidence may be used to prove the validity of children, and Section 125 of the CrPC addresses the maintenance of wives and children. According to Section 53, a doctor may examine an accused individual at the police officer's request in order to gather evidence that might be important in determining facts that are essential to the investigation of the crime. The examination of the accused in a rape case is covered under Section 53A. Section 54 addresses the examination of an accused individual at his own request in order to gather evidence that might refute his criminal activity. As a result, DNA evidence is essential to India's criminal justice system, and new developments in technology might help build an even better system. Legal adjustments and improvements must be incorporated.

DNA Evidence:

Since DNA evidence has been shown to be essential in criminal investigations, appropriate procedures must be followed to guarantee that the evidence is gathered securely and undamaged. To guarantee accurate and effective outputs, quality control must be implemented. In a number of instances, valuable and contributing evidence was rendered useless due to tainted or improperly managed evidence.

[17] Appeal (Civil) 3860 of 2001.
[18] N.D. Tiwari v. Rohit Shekhar, FAO (OS) No. 547/2011.
[19] Patel, N., Gautaman, V. K., & Jangir, S. S. (2013). The role of DNA in criminal investigation – Admissibility in Indian legal system and future perspectives. *International Journal of Humanities and Social Science Invention, 2*(7), 15–21.

Therefore, it is essential that someone with forensic experience do the collection and analysis of DNA evidence. Evidence needs to be kept in a secure location to prevent manipulation or inaccuracy.

Therefore, appropriate legislation is required to regulate the same. It is required of forensic specialists to operate impartially and fairly when evaluating DNA evidence presented to them[20]. Therefore, any neglect might result in the loss of important evidence that could establish the guilt or innocence of those who are charged[21]. This reinforces the necessity of appropriate legislation to guarantee the preservation of such evidence. In relation to the accused's medical assessment, the Malimath Committee Report also recommended the inclusion of a DNA expert in the CrPC[22].

The 2019 Regulation Bill for DNA Technology (Use and Application):

It was implemented in 2019 to control the use of DNA technologies that have been used to identify people. The Bill also outlines the use of DNA testing in civil court paternity proceedings and for offenses under the Indian Penal Code. The law also addresses the process that would be put in place to get DNA evidence from the accused, including the victim's and accused's permission. Additionally, the measure proposes the creation of a national and regional DNA data bank using information from DNA labs. Additionally, it seeks to create a regulatory body to supervise the operations of DNA labs and the DNA data bank.

The responsibilities of DNA labs and the penalties for unauthorized dissemination of personal DNA information are also included in the measure[23]. DNA evidence is used in criminal investigations in a number of nations, including the United States and the United Kingdom. As a result, the criminal justice system has benefited from scientific and technical developments. Additionally, they have set up a DNA data bank that is used very carefully to control the crime rate by stopping serious criminals from committing new crimes and raising the recidivism rate.

By instilling terror in the minds of criminals through the collection of DNA evidence and subsequent convictions, this also guarantees the protection of society. India is still lagging behind in applying these

[20] Adhikary, J. (2005). DNA technology and its application in the administration of justice: Problems and prospects. *SCC Journal, 5*, 7–16.
[21] LaPorte, G. M. (2018). Wrongful convictions and DNA exonerations: Understanding the role of forensic science. *National Institute of Justice, (279)*, 1–16. https://nij.ojp.gov/topics/articles/wrongful-convictions-and-dna-exonerations-understanding-role-forensic-science
[22] Barman, N., & Srivastava, A. R. (2020). An analysis on DNA technology under the Indian judicial system. *Asia Pacific Law & Policy Review, 6*, 33–56. https://thelawbrigade.com/wp-content/uploads/2020/04/Nilakhi-Ashutosh-APLPR.pdf
[23] Mourya, B. (2019). The role of DNA profiling evidence on criminal justice system in India. *AD VALOREM Journal of Law, 6*(1), 62–66.

advancements to criminal investigations, though. As the number of cases pending increases, it is equally critical to resolve cases quickly for the parties involved in order to provide justice. Similar to the adage "Justice postponed is justice denied," the Indian criminal justice system must embrace new technical advancements in order to discover criminals and free innocent people[24].

Challenges and Concerns:

The use of DNA technology in the Indian legal system is fraught with difficulties, despite its many benefits.

- **Lack of Infrastructure:** India's forensic infrastructure varies widely in terms of its level of development. Disparities in access to justice arise because rural and impoverished areas lack the resources required for DNA testing, whereas certain urban areas have access to cutting-edge forensic facilities.
- **Expensive:** The cost of DNA testing can be high, and underprivileged people or communities may find it difficult to afford this technology. The expense of DNA testing is still a major obstacle, despite government efforts to subsidize it in some circumstances.
- **Data Security and Privacy:** The establishment of a national DNA database has sparked worries about data security and privacy as well as the exploitation of genetic information. There are concerns that personal privacy may be violated if data is accessed or utilized by unauthorized parties. Strict measures are required to stop this kind of abuse.
- **Possibility of Misinterpretation:** Despite its scientific validity, DNA evidence is subject to mistakes. Inaccurate findings may result from incorrect testing methods, contamination, or poor evidence processing. To preserve the integrity of DNA evidence, law enforcement organizations and forensic specialists must follow strict guidelines.
- **Legal and Ethical Concerns:** Using DNA evidence presents ethical concerns, especially when it comes to permission and the potential for unintentional inclusion in a DNA database. Concerns have been raised over the potential use of this information in further investigations, particularly with regard to people who have not been found guilty of any crimes.

[24] Dhiman, D., & Kedwal, I. (2022). Constitutional validity of DNA evidence in the criminal justice system. *International Research Journal of Management Sociology and Humanities, 13*(4), 1–10. http://dx.doi.org/10.2139/ssrn.4109721

Conclusion:

DNA technology has undeniably become a powerful tool in the administration of justice in India, significantly enhancing the accuracy, efficiency, and transparency of the justice system. It holds the potential to revolutionize criminal investigations and exonerate the innocent, while also ensuring that justice is served to those guilty of heinous crimes. However, its effective integration into the justice system requires the development of proper legal and regulatory frameworks, enhanced forensic infrastructure, and careful attention to ethical concerns such as data privacy. The future of DNA technology in India is promising, but it will require continued investment in resources, training, and safeguards to ensure that it is used responsibly and effectively. With the right regulatory environment and infrastructure in place, DNA technology can significantly contribute to building a more reliable, just, and transparent legal system in India. DNA Evidence is observed to be highly accurate and can therefore, be used effectively in the criminal justice system. The ability to identify evidential data through DNA collected from cells, tissue, semen bodily fluids has proven to be substantial in ensuring guilty persons are punished and wrongfully convicted individuals are exonerated. With the absence of constitutional hurdles, such evidences prove to be critical in understanding the circumstance of the crime. Hence, DNA evidence safeguards not only the rights of the victims but also of those who are innocent. DNA findings can be used efficiently with other traditional evidences to understand the crime and identify the person responsible. To ensure that the evidences are examined with at most care it is necessary to be collected, preserved, processed and examined by a forensic expert having sufficient and accurate knowledge required for the same.