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The Urgency of Legal Regulation on the Use of Clinical DNA Tests as Evidence in Criminal Accountability in Indonesia

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Abstract: Clinical DNA testing as evidence in criminal liability is increasingly relevant along with the development of forensic technology. However, the criminal procedure law system in Indonesia, as regulated in the Criminal Procedure Code (Law No. 8 of 1981), has not explicitly accommodated the position of DNA testing as independent evidence. The use of DNA so far can only be categorized in expert testimony, which has raised debate regarding its evidentiary strength. Meanwhile, clinical DNA testing is also closely related to human rights protection, especially genetic privacy, as regulated in Law No. 27 of 2022 concerning Personal Data Protection. By referring to the latest Health Law (Law No. 17 of 2023) and developments in international practice, specific regulations on procedures, validity of results, and protection of DNA data are very urgent to avoid judicial errors and misuse of scientific evidence. This study uses a normative legal method with a statutory and conceptual approach. The results indicate that there is a need for an update to criminal procedure law to recognize clinical DNA testing as separate evidence while ensuring strict procedural standards. Thus, using scientific evidence can provide optimal contributions to the enforcement of criminal justice in Indonesia without ignoring the basic rights of individuals.

Keywords: DNA Testing, Criminal Liability, Genetic Privacy

INTRODUCTION

In the development of modern criminal law, evidence does not only depend on confessions, witnesses, or documents but also begins to involve technology and scientific findings (Rio Saputra, 2025). Scientific evidence, including DNA testing, has become the backbone of more objective evidence efforts, especially in cases that have biological elements such as murder and sexual violence (Futuhaat, 2023). Scientific evidence allows the search for truth to be done more precisely, reduces the subjectivity of interpretation by law enforcement officers, and encourages a fair trial process (Sativa, 2021). However, using this technology requires an adequate legal umbrella to validate fairness in the evidence system.

One of the most prominent forms of scientific evidence in current criminal law practice is clinical DNA testing (Susdarwono, 2025). This test works by analyzing a person's genetic structure to determine their biological identity (Patanra, 2020). In many countries, DNA testing has become part of a stand-alone and legally recognized evidence. However, in Indonesia,

although DNA testing has been used in several criminal cases, the regulations governing it have not been explicitly formulated in criminal procedure law (Afifah, 2020). The Criminal Procedure Code as the basis for Indonesian criminal procedure law only recognizes five types of evidence, namely witness statements, expert statements, letters, clues, and defendant statements (Darizta, 2023). Clinical DNA is not explicitly mentioned, so its position is often only categorized as part of expert testimony.

This absence of explicit recognition raises doubts about the evidentiary power of clinical DNA testing. In practice, scientific evidence requires strict procedural validation to be accepted in the legal process (Oosthuizen, 2022). If not regulated, this evidence can be rejected because it is considered not to meet the formal elements in the applicable evidentiary system. It is a dangerous loophole because it can eliminate the potential for strong evidence. It is where the importance of expanding the interpretation of Indonesian criminal procedure law lies to accommodate developments in technology and science (Kumendong, 2021).

In addition to the limitations of criminal procedure law, other problems arise from the definition and understanding of clinical DNA testing. Clinical DNA testing differs from forensic DNA testing in terms of the context of its use. Clinical tests are generally conducted in health facilities or medical laboratories for diagnosis or genetic tracing, but the results are often requested as evidence in legal cases (Meliala, 2023). It is where the need for laboratory quality standardization arises that can guarantee the accuracy of test results. International standards such as ISO/IEC 17025 are important references in ensuring that forensic and clinical laboratories have quality management systems and appropriate technical competence to produce legally reliable evidence (Rasiwan, 2025).

Within criminal law, it is important to understand that evidence is not only concerned with material truth but must also be carried out by the principles of fair procedural law (Adam Ilyas, 2024). The theory of scientific evidence places science-based evidence within the framework of due process of law, which ensures that the evidence process does not violate the basic rights of the suspect or defendant (Dianti, 2024). Scientific evidence must be collected, analyzed, and presented in a manner that can be openly verified, tested, and challenged in court. Otherwise, its validity as a basis for criminal liability may be questioned (Wulandari, 2023).

At the same time, there are very fundamental concerns regarding the protection of personal data, especially regarding genetic information which is highly sensitive (Setiawan, 2024). DNA is not just ordinary medical data; it contains information about a person's unique biological identity, including potential susceptibility to disease or family information (Doricchi, 2022). The use of genetic data as evidence must pay attention to the principles of protecting privacy rights guaranteed in the constitution and laws (Man & Muhammad, 2023). In this context, Law No. 27 of 2022 concerning Personal Data Protection is the main reference that emphasizes that biometric and genetic data are included in the category of sensitive personal data that must be processed with maximum protection (Sembiring, 2024).

DNA testing without a clear legal framework can open up opportunities for privacy rights violations, especially if carried out without the legitimate consent of the individual concerned. This will be especially problematic if used in criminal proceedings, where sampling can involve coercion or pressure. Without rules that limit who is authorized to collect, manage, and store DNA data, as well as the purpose of its use, the right to a person's physical integrity and personal data can easily be violated, even under the pretext of law enforcement interests.

The intersection between the need for scientific evidence and the protection of privacy rights creates a legal dilemma that cannot be ignored. On the one hand, the state is interested in using all forms of technology to enforce the law effectively and efficiently. On the other hand, the state is also obliged to protect its citizens from abuse of power, including in the investigation and prosecution process. This dilemma can only be overcome by establishing clear, detailed legal norms that support substantive justice and human rights.

Conceptually, the existence of legal regulations that recognize clinical DNA as a shred of independent evidence will strengthen the legitimacy of its proof in the criminal law system. It provides direction for law enforcement officers in utilizing this technology without violating the principles of due process and privacy rights. The regulation will also encourage laboratory standardization, expert accreditation, and legitimate evidence collection procedures, as well as strengthen the position of victims and defendants in obtaining justice. Thus, the discussion of the definition of evidence according to the Criminal Procedure Code, the characteristics of clinical DNA tests, the principles of scientific evidence, and the close relationship between genetic data privacy and individual constitutional rights are important as a foundation for thinking in building a modern, fair, and humane criminal evidence system in Indonesia. The absence of regulation is not just a legal vacuum, but also a lag in responding to social and technological realities that continue to move forward.

METHOD

This study uses a normative juridical method, namely a legal research approach based on the study of applicable positive legal norms, both in the form of laws and regulations, doctrines, legal principles, and relevant court decisions. The key focus of this study is to examine the validity and urgency of legal regulations on the use of clinical DNA tests in the criminal evidence system in Indonesia. In this approach, data is obtained through literature studies by reviewing laws and regulations such as the Criminal Procedure Code (KUHAP), Law Number 17 of 2023 concerning Health, Law Number 27 of 2022 concerning Personal Data Protection, and various technical regulations such as the Regulation of the Minister of Health concerning forensic laboratories. In addition, this study also uses a conceptual and comparative approach, namely by analyzing the concepts of scientific evidence law and comparing them with practices in other countries that have previously regulated the use of genetic data as evidence, to provide a more comprehensive normative perspective. The analysis is carried out qualitatively, namely by interpreting the meaning of legal norms and legal doctrines to formulate legal conclusions and recommendations that are argumentative and systematic. This approach was chosen because it is appropriate to answer problems related to the lack of norms and the need for legal policy reformulation in the context of the development of forensic technology in the modern era.

RESULT AND DISCUSSION

Use of Clinical DNA Testing in Criminal Evidence in Indonesia

In the Indonesian criminal procedure system, the regulation of formal evidence still refers to the provisions of Law Number 8 of 1981 concerning Criminal Procedure Law (KUHAP). Article 184 of the Criminal Procedure Code mentions in a limited manner the types of evidence that are legally valid, namely witness statements, expert statements, letters, clues, and statements from the defendant (Hawasara, 2022). DNA testing, in this context, is not explicitly mentioned as independent evidence. As a result, the use of DNA testing in criminal justice practice often has to be attached to the category of "expert testimony", as stated in Article 186 of the Criminal Procedure Code, which reads: "Expert testimony is what an expert states in court." It means that the results of a DNA test will only have evidentiary value if they are submitted by a qualified expert and provide a technical explanation of the results before a panel of judges (Zega, 2021).

This condition places DNA as an aid that depends on strengthening expert interpretation, not as stand-alone evidence. DNA testing is a technology-based scientific instrument with a high level of accuracy, especially in determining biological identity. However, in court practice, the validity and evidentiary weight of DNA results must still go through formal means in the form of expert testimony. This sometimes causes ambiguity when there is a discrepancy

between the test results and the interpretation of the expert who delivered them. Within this framework, the judge is not obliged to accept or assess the test results as the sole and decisive evidence because the evidentiary system in Indonesia still adheres to the principle of limited free evidence.

In practice, DNA testing has been used several times in criminal cases involving murder, rape, and sexual crimes against children. One prominent example is the use of DNA testing in the Engeline murder case in Bali in 2015, where DNA testing was used to strengthen forensic evidence regarding the injuries and violence experienced by the victim. Besides, in several cases of rape of minors, DNA obtained from the perpetrator's sperm is a vital instrument for biologically identifying the perpetrator of the crime. However, the DNA results in these cases still do not stand alone; they are strengthened through other evidence such as witness statements, *visum et repertum*, and the suspect's confession. This reflects that the position of DNA is still secondary in the construction of Indonesian criminal procedure law.

On the other hand, the legal basis governing the procedures and standards for DNA testing in clinical and forensic contexts has begun to be formed through Law Number 17 of 2023 concerning Health. The law contains provisions regarding health laboratories that function to test biological specimens for diagnosis, treatment, or legal investigation. For example, Article 422 paragraph (1) states that health laboratories can do service, training, and research functions in biological testing, including DNA-based testing. Although the main context of this law is health services, its implications for the use of laboratory results in criminal evidence are very significant, especially if the laboratory is accredited nationally or internationally.

Furthermore, the government through the Regulation of the Minister of Health (Permenkes) No. 36 of 2024 concerning Forensic Laboratory Service Standards has also established technical and ethical criteria related to the management of laboratories that conduct forensic tests, including DNA testing. In this Permenkes, it is emphasized that forensic laboratories must have a quality management system that complies with the ISO/IEC 17025 standard and have certified professional staff to conduct genetic analysis. This regulation also regulates the procedures for taking, storing, and reporting biological samples that can be used as evidence, thus minimizing the potential for manipulation or procedural errors that can taint the validity of the evidence.

The Minister of Health Regulation also emphasizes the importance of documenting the chain of custody in every stage of biological evidence management, from taking it at the crime scene to testing it in the laboratory. It is important in the criminal justice system which demands continuity and authenticity of evidence. Irregularities in storage or analysis procedures can reduce the credibility of DNA results as scientific evidence. A damaged or poorly documented chain of custody can raise doubts and even result in the evidence not being accepted in court.

However, the legal issue that arises is the absence of provisions in the Criminal Procedure Code or special criminal procedure regulations that explicitly state that DNA results can be used as valid evidence in court. As a result, although DNA test results can be an important part of the investigation process, their position remains uncertain in court. This results in dependence on subjective interpretations of judges and expert testimony, which do not always have a clear and consistent legal basis. The use of DNA in Indonesia's current evidentiary system is more ad hoc and casuistic, rather than based on a comprehensive normative legal framework.

In the legal vacuum regulating DNA usage as evidence poses a risk not only to the effectiveness of law enforcement but also to the protection of human rights. Without an explicit and uniform legal basis, the opportunity for procedural violations in the collection, testing, or presentation of DNA evidence becomes very open. On the other hand, this legal uncertainty also makes it difficult for judges to provide proportional evidentiary weight. Therefore, efforts

are needed to synchronize the Criminal Procedure Code, the Health Law, and other sectoral regulations to build normative clarity in using clinical DNA as a valid and just criminal evidence tool.

Urgency of Legal Regulation of Clinical DNA Testing as Evidence

The absence of specific legal regulations regarding clinical DNA testing in the criminal justice process raises fundamental issues related to legal certainty. In a legal system that prioritizes the principles of legality and procedural justice, strong scientific evidence such as DNA should have a clear normative basis, especially in the testing process, interpretation, and acceptance in court. When there is no legal standardization, sampling, analysis methods, and reporting of DNA results can vary between institutions or jurisdictions. It opens room for manipulation or fabrication of results that not only harm individuals but also harm the integrity of the criminal justice system.

In situations like this, the potential for misuse is very high, especially when DNA collection or testing is carried out without strict supervision or without clarity about who is authorized and how the mechanism works. For example, if a suspect is forced to provide a DNA sample without a valid legal basis and procedural supervision, the test results can be used arbitrarily, even if they are carried out outside an official institution. The lack of regulation makes the evidentiary system vulnerable to deviations because there is no valid control and accountability mechanism. This is an irony in a legal system that should guarantee a fair and objective process.

Indiscriminate DNA sampling without valid consent also results in serious violations of human rights. Article 28G paragraph (1) of the 1945 Constitution guarantees the protection of the person, honor, and dignity of humans, including protection of the privacy of biological data such as DNA. In this context, DNA testing is not only a matter of medical technicalities but also concerns the constitutional rights of individuals. Law Number 27 of 2022 concerning Personal Data Protection (UU PDP) has also classified genetic data as specific personal data, the management of which requires a strict legal basis, explicit consent, and protection against misuse. When DNA collection or processing is not based on this principle of privacy protection, then this action can be categorized as a serious violation of the law that impacts the legitimacy of the judicial process.

Furthermore, the absence of specific regulations regarding clinical DNA testing has a direct impact on the uncertainty of criminal liability. In criminal cases, invalid evidence can lead to two extreme possibilities: convicting an innocent person or acquitting the actual perpetrator of the crime. When DNA is used without standard legal procedures, the validity of the results is easily questionable. In such a situation, the judge will face a dilemma: whether to accept the results of a DNA test that is very strong scientifically but has no procedural legitimacy or to reject it because it does not meet formal legal standards. This dilemma indicates a legal vacuum that needs to be filled with proportional and clear regulations.

Inconsistency in the acceptance and assessment of DNA test results also worsens the situation. In some cases, DNA test results may be used as the main tool in determining the guilt of the accused, while in other cases they are rejected on the grounds of procedure or legitimacy. This inconsistency creates injustice in legal practice because the decision becomes very dependent on the subjectivity of the judge or the ability of the prosecutor and lawyer to interpret the scientific results. Without legal norms that regulate how DNA tests can be used, when they can be taken, and who is authorized to interpret them, justice in the legal process becomes unequal.

To overcome this problem, legal reform is needed that touches on two main aspects: revision of criminal procedure regulations and special regulations preparation on using forensic technology, including genetic data. The revision of the Criminal Procedure Code must include

expanding the recognition of evidence based on technology and science, not only limited to conventional forms such as expert testimony or letters. The new version of the Criminal Procedure Code must accommodate a legal mechanism to recognize DNA testing results as stand-alone evidence, as long as they meet the requirements of objectivity, accuracy, and procedure.

Furthermore, new regulations in the form of a Draft Law on Forensic Technology and Genetic Data need to be designed as a comprehensive legal umbrella. These regulations should not only regulate the technical aspects of DNA collection and testing but also guarantee individual rights during the legal process. These regulations must be in line with international standards and human rights principles as stated in the constitution and international legal instruments. They must contain clauses on laboratory accreditation, expert competence, and standards of scientific evidence that are acceptable in the national legal system.

The law needs to regulate the establishment of an independent supervisory institution that has the authority to audit forensic laboratories and supervise procedures for the use of genetic data in criminal cases. This is important to ensure that DNA testing is not used as a tool that suppresses or injures the basic rights of individuals, but rather as an objective tool that supports the search for material truth in the judicial process. This supervisory mechanism must also provide space for complaints and legal protection for parties who feel disadvantaged using DNA data.

Ultimately, the urgency of legal regulation of clinical DNA testing as evidence is not only a technical procedural issue, but concerns the fundamental principles of justice, truth, and respect for human dignity. In the modern world of justice that continues to be influenced by the development of science and technology, the legal system must not be left behind. Recognition of DNA as scientific evidence must be accompanied by adequate legal regulations so that scientific excellence does not become a source of injustice.

CONCLUSION

To answer the legal need for clinical DNA testing as evidence in criminal liability in Indonesia, it can be concluded that currently there is a fairly serious normative vacuum. Clinical DNA testing, although it has been scientifically proven to make a major contribution to efforts to reveal the truth in criminal cases, has not received adequate legitimacy in the Criminal Procedure Code's evidentiary system which still uses the paradigm of conventional evidence. In practice, DNA is often positioned through expert testimony, but without specific legal recognition and binding standard procedures, the validity and acceptance of such evidence in court depends on the subjective interpretation of law enforcement officers and judges. This condition creates legal uncertainty, opens up opportunities for potential misuse of personal data, and threatens the constitutional rights of individuals as regulated in the 1945 Constitution and the Personal Data Protection Law. Given the importance of DNA as scientific evidence, the national legal system needs to immediately accommodate this development by forming regulations that expressly regulate the process of taking, testing, using, and protecting DNA data in criminal cases.

Based on this conclusion, it is recommended that the government and lawmakers take two strategic steps: first, revise the Criminal Procedure Code to include clinical DNA as a separate type of evidence that has clear evidentiary standards and procedures; second, draft a Bill on Forensic Technology and Genetic Data that comprehensively regulates all related aspects, from laboratory requirements, expert certification, sampling procedures, consent principles, privacy protection, to monitoring mechanisms. This update must be designed concerning the principles of due process of law, protection of human rights, and international standards such as ISO/IEC 17025. Thus, the Indonesian criminal justice system can ensure that the use of modern technology in evidence not only increases the effectiveness of revealing the

truth, but also remains within the framework of justice, transparency, and respect for human dignity.

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