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# The National Database for Genetic Fingerprint: Scientific Evidence Against the Right to Genetic Privacy

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***Abstract:***

*Establishing the right of society to determine the facts and uncover perpetrators of complex crimes required implementing the principle of proof's freedom by approving the right to use all methods of proof, including the use of scientific evidence derived from modern scientific technologies, such as genetic fingerprint which was collected within a National Database for Genetic Fingerprint in order to use it when needed. Nevertheless, the use of scientific evidence runs against the requirements of protecting the basic rights of individuals, foremost of which is the right to Protect their personal genetic data. This has required an attempt to balance between the public interest of society on the one hand, and the personal rights of individuals on the other hand.*

***Keywords:*** *Database; Genetic; Data; Evidence; Right to Privacy.*

## Introduction:

*The world has experienced a tremendous revolution in the technological field, and this technological development has been accompanied by another evolution in biology, which has witnessed broad scientific prospects that include the emergence of new technologies such as the system of genetic fingerprint, which has been used in many fields. These new scientific technologies have been introduced into the field of proof, as genetic fingerprint system has emerged as one of the most effective scientific methods for proving many intractable cases and crimes that are often impossible to prove by traditional methods.*

*In its effort to benefit from genetic fingerprint technology, Algeria enacted Law No. 16/03 regarding the use of genetic fingerprint, establishing a National Database for Genetic Fingerprint. This*

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*database functions as a bank containing biological samples and genetic data of certain individuals.*

*The National Database for Genetic Fingerprint represents a practical embodiment of the principle of proof by scientific evidence stipulated in the second paragraph of Article 40 of the Family Law as amended by Order No. 05/02. Nonetheless, keeping pace with biological developments and relying on genetic data listed within National Database for Genetic Fingerprint leads us to a question which is:* ***How far does society's right to seek the truth through genetic data listed within the National Database interfere with individuals' genetic privacy rights?***

*This study employs a descriptive-analytical method, through describing and analyzing the controls and conditions for preserving genetic data included in this rule within the framework of the provisions of Law No. 16/03 related to DNA, as well as Executive Decree No. 17/277, which specifies the conditions and procedures for organizing and operating the National DNA Database Department.*

*In order to elaborate on the topic, the study will be divided into two main chapters. The first chapter will address the functional organization of the National Database for Genetic Fingerprint and everything related to the data included in this database and the various stages followed up to the stage of preserving data in the database. While the second chapter will be devoted to the issue of this database's contribution to the field of evidence and the restrictions on the use of data included in the database and individual guarantees in the face of this.*

## ***Chapter I: The Functional Organization of the National Database for Genetic Fingerprint:***

*The National Database for Genetic Fingerprint is one of the systems established under Law No. 16/03 relating to the use of genetic fingerprint(1), whereby a central DNA department was established at the Ministry of Justice to form, manage and preserve the National Database for Genetic Fingerprint obtained from the analysis of biological samples(2). The National Database for Genetic Fingerprint includes a set of genetic data obtained from biological samples collected from certain categories of individuals as defined by law.*

### ***1. Genetic Data Included in the National Database for Genetic Fingerprint:***

*The issue of genetic fingerprints is regarded as one of the emerging issues on which contemporary scholars have differed and disputed regarding the fields from which it can benefit. It is considered an argument that can be relied upon wholly or partially. The use of genetic fingerprints has become widespread in Western countries and has been approved by a number of European courts. It has also been adopted in Islamic countries after extensive debate regarding its legitimacy from a religious perspective.*

***A.Genetic Fingerprints as an Essential Element within the National Database for Genetic Fingerprint:*** *Genetic fingerprints consist of two terms: "fingerprint" and "genetics." Linguistically, a fingerprint refers to a mark or impression and is derived from the act of pressing, specifically from the tip of the little finger to the tip of the ring finger. It can also refer to the impression left by a finger seal. Genetics, on the other hand, is the science that studies the transmission of traits from one generation of living organisms to the next and explains the phenomena related to this inheritance.*

*Jurisprudence has defined the genetic fingerprint as the mark or impact that is transmitted from ancestors to descendants, meaning it is the material that carries of genetic factors and genes in living organisms(3).*

*The nucleus located in every cell in the human body, except red blood cells, is considered the repository of genetic material found on chromosomes, which differ from one organism to another and number 46 chromosomes in humans, excluding sex chromosomes.*

*The chromosome is composed of a long chain of genetic material, DNA, known as deoxyribonucleic acid, and is composed of the bases adenine (A), thymine (T), guanine (G), and cytosine (C), in addition to pentose sugar and phosphorus. After these bases connect to each other to form DNA, they coil in the form of helical ladders around each other(4), forming two twisted chains, one chain representing hereditary characteristics from the father and the other chain representing hereditary characteristics from the mother. From the combination of the two chains, the human is distinguished by characteristics that distinguish them from other humans, which form what is called the genetic code(5).*

***B.Genetic Fingerprints Subject to Preservation:*** *The Algerian legislature, under Articles 5 and 10 of Law No. 16/03, restricted the*

*genetic fingerprints that are registered at the level of the National Database for Genetic Fingerprint to those of specific categories of individuals.*

*The first category includes those suspected of committing certain misdemeanors and felonies specified in Article 5, namely crimes committed against state security or property, crimes against persons, and crimes against public order.*

*Genetic fingerprints are also preserved for those suspected of committing drug crimes, terrorism financing or money laundering, in addition to those suspected of committing assaults against children.*

*The second category includes those convicted.*

*The third category includes deceased persons of unknown identity and missing persons.*

*The fourth category includes crime victims and volunteers.*

*The fifth category includes persons who suffer from conditions that prevent their identification due to their age, such as the elderly, or due to chronic diseases, disability, or impairment of their psychological or mental faculties.*

*The specification of which genetic fingerprints are stored in the database serves as a safeguard against violating individuals' right to privacy, as all categories, referred to in Article 10, have their genetic fingerprints used either for the purpose of employing them in the field of establishing kinship, such as the category of deceased persons of unknown identity and missing persons, as well as the category suffering from conditions preventing their identification, or for criminal evidence purposes, such as convicted persons, crime victims, and volunteers.*

***2. The Method of Genetic Data Storage in the National Database for Genetic Fingerprint:***

*The storage of genetic data in the National Database for Genetic Fingerprint constitutes a fundamental stage in the establishment of the database. Nevertheless, this storage stage is preceded by a sensitive and essential stage: the collection and analysis of samples. This stage is of critical importance and is therefore governed by a set of strict regulations and safeguards.*

***A. The Stage of Taking and Analyzing Samples:*** *The stage of taking biological samples[(6)] is considered one of the stages that the legislature has surrounded with a set of restrictions, as no samples may be taken from any person unless they belong to the aforementioned categories.*

*Before taking samples, authorization must be obtained from the competent judicial authorities. The Public Prosecutor, the investigating judge, and the trial judge are each authorized, according to the case, to order the taking of samples for conducting genetic analyses. Judicial police officers may also request the taking of biological samples for conducting genetic analyses on them, and these analyses are conducted only after obtaining prior authorization from the competent judicial authority(7).*

*Biological samples are taken either by biologists belonging to the police force who have the status of judicial police officers and agents, or by persons qualified for this purpose under the supervision of judicial police officers, or by persons requisitioned by judicial authorities.*

*As for persons in penal institutions who have been finally convicted, their biological samples are taken after obtaining authorization from the Public Prosecutor's Office within whose jurisdiction the penal institution is located.*

*Nonetheless, there are exceptions related to certain categories such as children. In addition to the aforementioned conditions, samples cannot be taken from a child except in the presence of one of their parents, guardian, custodian, or their legal representative. In the event of impossibility or difficulty in their attendance, samples can be taken in the presence of the representative of the specialized Public Prosecutor's Office(8). The requirement of the presence of the guardian or their representative falls within the framework of strengthening the legal guarantees granted to children and protecting them from any threat to their physical and psychological safety.*

***B.Stage of Receiving and Storing Genetic fingerprints:*** *The Central Genetic Fingerprinting Service consists of several units, including the DNA reception unit, which is responsible for creating and maintaining the genetic fingerprints files, as well as receiving and classifying genetic fingerprints according to the aforementioned categories. Meanwhile, the DNA Registration and Storage Unit collects and records the genetic fingerprints along with all related information and data, such as the identity of the individual (if known), the date and location of the crime, the case number, and details regarding the evidence containing the biological samples. All information in the National Database for GeneticFingerprint(9)is updated during the*

*legally prescribed retention period set out in Article 14 of Law 16/03, which typically ranges between 25 and 40 years.*

***Chapter II: The Contribution of the National Database for GeneticFingerprint to Evidence:***

*The credibility and authenticity of scientific methods vary depending on the biological analysis used. For example, medical expertise based on genetic fingerprints carries conclusive significance and is a scientific method that is almost infallible and rises to the level of definitive evidence.*

*For genetic data listed within the National Database for Genetic Fingerprint to be considered reliable and legitimate scientific evidence that the judge can rely upon, a set of legally prescribed safeguards and protections for individuals must be observed.*

***1. Fields of Use of Genetic Data Listed within the National Database for Genetic Fingerprint:***

*Contemporary biology, through DNA, contributes to evidence, especially in civil cases and certain special crimes. It helps in detecting and identifying criminals and determining the real perpetrator in cases of rape, theft and disputes related to lineage cases. It is a technology with authenticity in establishing lineage.*

*Due to the effective contribution made by DNA technology, developed countries have encouraged its use as criminal evidence. Many cases have been resolved based on the use of genetic fingerprints as evidence in criminal and civil matters.*

***A.Verification and Denial of Lineage or Kinship:*** *Genetic fingerprints are used to verify or deny in cases of claiming kinship for the purpose of inheritance after the death of a specific person. Under no circumstances, a Family Court judge shall not rule on the issue of verifying lineage through scientific methods without seeking the consultation from specialized experts in the field of biology to reach accurate scientific results, as these are technical matters that the judge cannot decide except with the assistance and guidance of experts and their opinions[(10)].*

*Genetic fingerprints contribute to verifying or denying lineage because it is a technique with conclusive evidentiary power. It exists in a single form in all body components, whether blood, semen, hair or in any organ of the body, and it is a protein that carries hereditary traits or genes that carry specifications that differ from one person to*

*another, and remain constant throughout life until the corpse decomposes after death. This allows forensic experts to determine a child's parentage through DNA analysis: the child's DNA is compared with the father's DNA to establish paternity and with the mother's DNA for maternal matching. If the DNA matches, the child's lineage to the father, mother, or both is confirmed; if it does not match, lineage is denied.*

*The use of genetic fingerprints relies on scientific expertise, where the necessity of DNA testing is determined based on the high accuracy of verifying or denying lineage through this scientific method. Experts and medical professionals indicate that this technique achieves a very high level of reliability in evidence.*

***B.Evidence in Criminal Cases:*** *The science of fingerprints has developed tremendously. Fingerprints are not limited to fingers only; forensic investigators have been able to identify a person from their eye, ear, and dental prints. The field continues to advance at an amazing speed in order to achieve a match between factual and legal reality in the pursuit of justice.*

*Genetic fingerprints are a powerful technology introduced by molecular biology into the criminal justice system. DNA is used to solve many cases because it is directly linked to bodily secretions that differ between perpetrators and victims. Thus, many forensic experts have paid great attention to developing methods for examining biological traces, where they have been able to apply DNA and prove that there are some parts of these nucleic acids that are unique to each person, which has made connecting the perpetrator to the crime scene no longer a dream and establishing paternity no longer impossible.*

*The importance of DNA in criminal cases lies in its ability to provide conclusive identification in most cases and to achieve a high degree of evidentiary certainty regarding the source of biological traces.*

*Genetic fingerprints have contributed to uncovering many truths in the pursuit of justice and has been instrumental in identifying criminals, as illustrated below:*

***- Identifying the Perpetrator:*** *This is accomplished by analyzing the DNA from blood stains found at the crime scene or on the clothing of the suspect or the victim. These blood stains are then compared with the genetic fingerprints of potential suspects or individuals with matching blood types*[(11)].

*The identity of criminals can also be determined by linking the suspect to saliva traces or other contaminations found at the crime scene, either by blood type analysis if the person is a secretor or by genetic fingerprints.*

***- Identifying Perpetrators in Sexual Crimes:*** *Genetic fingerprints of semen collected from the victim's clothing or intimate areas is compared with the suspect's DNA. In adultery cases, paternity can be disproved if the sample taken from the accused does not match the husband's DNA, providing scientific evidence of infidelity.*

***2. Rules for the Use of Genetic Data in the National Database for Genetic Fingerprint:***

*Given the importance of genetic data in the National Database for Genetic Fingerprint, in which genetic fingerprint constitutes conclusive scientific evidence based on analysis and considering that this data contributes significantly in uncovering facts, it is recognized as scientific evidence with definitive evidence. This is especially true when a set of legal safeguards is observed to ensure the validity of relying on this data as lawful evidence.*

***A.Respect for the Right to Genetic Privacy:*** *The right to protection of private life is a constitutional right guaranteed to individuals under Article 47 of the Algerian Constitution. Yet, the broad concept of the right to privacy serves as the legal framework for all rights derived from it, including the individual's right to protect their personal data from any unlawful use.*

*The right of individuals to protect their personal data has been explicitly enshrined in the text of the Constitution. All active bodies during the various stages of taking and analyzing biological samples, as well as during the stage of using genetic data related to individuals' hereditary characteristics, must work to respect the inviolability of individuals' private lives and protect all their personal data.*

*The right to genetic privacy constitutes one of the most crucial basic obstacles to the application of modern scientific methods in evidence, especially DNA examination, which constitutes an interference in the individual's private life, because it opens the field for researching genetic characteristics through the person's genetic predisposition, which may provide others with information of a special personal nature (such as revealing personality, temperament, criminal predisposition, hereditary diseases...).*

*Based on the aforementioned, interference with genetic privacy is permissible only for higher purposes pursued by the legislature, despite the potential impact on private life. However, this interference is strictly limited, and all information obtained from DNA testing must be treated with a high degree of confidentiality. The use of biological samples or genetic fingerprints is prohibited outside the legally authorized purposes, and anyone who discloses secrets from the National Database for Genetic Fingerprint is subject to legal penalties.*

***B.Protection of Physical Integrity:*** *The right to physical integrity is considered one of the constitutionally guaranteed rights, as it was established under Article 39 of the Constitution. The state, with all its structures, ensures that human dignity is not violated, and any physical or moral violence against persons is prohibited.*

*Genetic analysis is conducted only on the non-coding genetic parts of DNA, excluding the part responsible for determining gender[(12)].*

*In the case of a person's consent and approval of the examination, their voluntary approval fixes the problem and this falls within the scope of rights that a person may waive. However, the problem occurs in the case of a person's refusal to submit to examination in order to obtain the sample. In this case, Algerian legislature addresses refusal to submit to biological analysis for genetic fingerprints by criminalizing the act. The law prescribes penalties of imprisonment ranging from one to two years, along with fines ranging from 30,000 to 100,000 DZD [(13)].*

## ***Conclusion:***

*Although conducting biological analyses to determine genetic fingerprints sometimes infringes on an individual's human rights, particularly the right to genetic privacy, which is closely linked to personal dignity, the principle of prioritizing the public interest has guided legislation. The public interest includes society's right to know the truth in cases of lineage and the right to identify perpetrators in complex crimes. Consequently, the legislature has recognized and valued scientific evidence in the field of evidence by establishing a National Database for Genetic Fingerprint to attain higher purposes, even if this entails some impact on individuals' private lives.*

*Among the suggested recommendations to address challenges and barriers affecting the effectiveness of the National Database for Genetic Fingerprint as a primary reference for evidence are:*

*The accuracy and reliability of genetic data depend significantly on the expertise of the staff handling the database. Workers must be among those with high expertise and advanced scientific and technical qualifications to prevent errors that could compromise results and infringe on rights. Thus, it is necessary to:*

*1- Equip laboratories and technical facilities with the best equipment with international technologies and technical specifications.*

*2- Focus on continuous training of human resources working in these laboratories, such as experts and technicians, with selection and employment of competent human resources as well as those characterized by qualities of honesty and morality.*

*3- Private sector should only conduct DNA testing under judicial authorization. Laboratories and technical facilities should be state-controlled to prevent manipulation of human genes or leaks of personal genetic data.*

*4- Train sworn experts and specialists in genetic analyses at the court level.*

*5- Each country should establish a dedicated DNA committee comprising sworn experts, judges, and administrators. Its main role would be to supervise genetic fingerprints results and validate them before inclusion in the National Database for Genetic Fingerprint.*

***Referrals and References:***

*(1)- Law No. 16-03 of 19 July 2016, Concerning the use of genetic fingerprints in judicial proceedings and the identification of persons, Official Journal, No. 37, issued on 22 July 2016.*

*(2)- Article 09 of Law No. 16-03 of 19 July 2016, concerning the use of genetic fingerprints.*

*(3)- Helaly Saad El din Mas'ad, Genetic Fingerprinting and Its Legal Relations: A Comparative Study, 2nd Ed., Wahba library, Cairo, Egypt, 2010, p. 25.*

*(4)- Al-Bahji Issam Ahmad, Compensation for Damages Resulting from Genetic Engineering Applications in Light of the Rules of Civil Liability, Dar Al-Jami'a Al-Jadida for Publishing, 2006 Ed., p. 33.*

*(5)- The genetic fingerprint and all its components were defined under Article of Law No. 16-03, concerning the use of genetic fingerprint, aiming at defining the type of fingerprint to be listed within the National Database for Genetic Fingerprint.*

*(6)- As biological samples are considered specialized technical concepts, the legislature defined biological samples as tissues or biological fluids that allow the extraction of a genetic fingerprint.*

*(7)- Article 04 of Law No. 16-03, concerning the use of genetic fingerprints in judicial proceedings and the identification of persons.*

*(8)- Article 05 of Law No. 16-03, concerning the use of genetic fingerprinting.*

*(9)- Article 6 of the Executive Decree No. 17/277 of 19 October 2017, specifying the conditions and procedures for organizing and operating the National Genetic Fingerprint Service, Official Journal, No. 60, issued on 19 October 2017.*
*(10)- Iskandar Mahmoud Toufik, Judicial Expertise, Dar Houma, 2002, p. 37.*
*(11)- YahnamRamsis, Scientific Police or the Art of Investigation. 1996 Ed., p. 151.*
*(12)- Article 7 of Law No. 16-03, concerning the use of genetic fingerprinting.*
*(13)- Article 16 of Law No. 16-03, concerning the use of genetic fingerprinting.*