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DNA data exchange between EU member-states under the Prüm II regulation

DNA profiling plays a critical part in identifying a person involved in a crime. It also sheds light on ties such as genetic relationships between distant populations, which could aid in criminal ancestry identification and cross-border crime resolution. The study has a regulatory framework governing the exchange of DNA between EU member-states under the Prüm II Regulation. Given that the regulation facilitates the exchange of DNA for law enforcement purposes, national law must ensure compliance. By comparing the legal framework on this issue, the study highlights the need for harmonization of databases for the efficient and secure exchange of DNA data in criminal investigations.

Key words: genomics; DNA profiles; DNA databases; law enforcement purposes; cross-border crime and terrorism.

Statement of the problem. On 25th of April 2024 came into force the Regulation (EU) 2024/982 on the automated search and exchange of data for police cooperation, and amending Council Decisions 2008/615/JHA and 2008/616/JHA and Regulations (EU) 2018/1726, (EU) No 2019/817 and (EU) 2019/818, being initially published in the Official Journal of the EU on 5th of April 2024. Accordingly, Member States should, at the time of initial connection to the router established by the Prüm II Regulation¹, conduct automated searches of DNA profiles by comparing all the DNA profiles stored in their databases with all the DNA profiles stored in all the other Member States' databases and Europol data². At the same time, when it is possible to exchange genetic information, national databases use different software systems for comparison (while the majority use CODIS³, other countries such as Germany, Austria, Denmark, France, Luxembourg, and the United Kingdom, among others, use other systems)⁴.

The latest research results. According to the case description by Toom V. et al.⁵ on 22 March 2016, a bomb was detonated at Maalbeek station in Brussels, resulting in the deaths of twenty individuals. As part of the ongoing criminal investigation, automatic rifles were discovered in a residence near Paris two days later. In early 2018, these rifles were re-examined, leading to the collection of biological traces and the extraction of DNA profiles. The profiles were then uploaded to the French national DNA database. In accordance with the Prüm Decisions, these profiles were also compared with

ФІНАНСУВАННЯ

Це дослідження не отримувало жодних спеціальних грантів від фінансуючих організацій у державному, комерційному чи некомерційному секторах.

ЗАСТЕРЕЖЕННЯ

Фінансуюча сторона не брала участі в розробці дизайну дослідження, зборі та аналізі даних, прийнятті рішення про публікацію або підготовці рукопису.

УЧАСНИКИ

Автор брав участь виключно в інтелектуальній дискусії, що лежить в основі цієї статті, дослідженні прецедентного права, написанні та редагуванні, і несе відповідальність за зміст та інтерпретацію.

ДЕКЛАРАЦІЯ ПРО КОНФЛІКТ ІНТЕРЕСІВ

Автор заявляє, що у нього немає конфлікту інтересів.

¹ Regulation (EU) 2024/982 of the European Parliament and of the Council of 13 March 2024 on the automated search and exchange of data for police cooperation, and amending Council Decisions 2008/615/JHA and 2008/616/JHA and Regulations (EU) 2018/1726, (EU) No 2019/817 and (EU) 2019/818 of the European Parliament and of the Council (the Prüm II Regulation) PE/75/2023/REV/1 OJ L, 2024/982, 5.4.2024.

² Ibid, Recital 13.

³ The Combined DNA Index System (CODIS) is the nationwide DNA database of the United States, made and supervised by the Federal Bureau of Investigation.

⁴ Triverio, S. C., & Crespillo Márquez, M. (2022). The need for cross-border exchange of genetic data for criminal investigation purposes in Latin America: implementation challenges. *Spanish Journal of Legal Medicine*, 48(4), p. 160.

⁵ Toom, V. et al. (2019). The Prüm Decisions as an Aspirational regime: Reviewing a Decade of Cross-Border Exchange and Comparison of Forensic DNA Data. *Forensic science international : genetics*, p. 50



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ОБМІН ДАНИМИ ДНК МІЖ КРАЇНАМИ-ЧЛЕНАМИ ЄС ЗГІДНО З РЕГЛАМЕНТОМ ПРІУМА ІІ

ДНК-профілювання відіграє ключову роль у встановленні особи, причетної до злочину. Воно також дає змогу визначити генетичні стосунки між віддаленими популяціями, що може допомогти в ідентифікації та розкритті транскордонних злочинів. Дослідження має нормативні рамки, що регулюють обмін ДНК між країнами-членами ЄС за Регламентом Пріума ІІ. Враховуючи те, що регулювання сприяє обміну ДНК для цілей правоохоронних органів, національні закони країн членів повинні забезпечувати їх дотримання. Порівнюючи законодавчу базу у цьому питанні, дослідження підкреслює необхідність гармонізації баз даних для ефективного та безпечного обміну даними ДНК у кримінальних розслідуваннях.

Ключові слова: геноміка, ДНК-профілі, бази даних ДНК, правоохоронні цілі, транскордонна злочинність і тероризм.

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DATENAUSTAUSCH VON DNA-PROFILIEN ZWISCHEN EU-MITGLIEDSTAATEN GEMÄSS DER PRÜM-II-VERORDNUNG

Zusammenfassung. Das DNA-Profilingspielt eine Schlüsselrolle bei der Identifizierung von Personen, die in Straftaten verwickelt sind. Es ermöglicht zudem die Bestimmung genetischer Beziehungen zwischen entfernten Populationen, was bei der Identifizierung und Aufklärung grenzüberschreitender Kriminalität hilfreich sein kann. Die Studie untersucht den normativen Rahmen, der den DNA-Austausch zwischen EU-Mitgliedstaaten gemäß der Prüm-II-Verordnung regelt. Angesichts der Tatsache, dass die Verordnung den DNA-Austausch zu Zwecken der Strafverfolgung fördert, müssen die nationalen Gesetze der Mitgliedstaaten deren Einhaltung gewährleisten. Durch den Vergleich der gesetzlichen Rahmenbedingungen in dieser Frage unterstreicht die Studie die Notwendigkeit einer Harmonisierung der Datenbanken für einen effizienten und sicheren Austausch von DNA-Daten in strafrechtlichen Ermittlungen.

Schlüsselwörter: Genomik, DNA-Profile, DNA-Datenbanken, Strafverfolgungszwecke, grenzüberschreitende Kriminalität und Terrorismus.

DNA records from other national databases connected to the Prüm regime. This cross-border comparison identified matches with three individuals whose DNA profiles were stored in the Dutch DNA database. Consequently, the suspects were arrested in the Netherlands on 18 June 2018. Hence, a Prüm II Regulation especially relevant in Southeast Europe since it is clear the need to enhance cross-border cooperation in fighting cross-border crime and terrorism. Therefore, it is significant to explore the challenges given by new Prüm II Regulation and check the readiness of domestic law of Member States to meet those thereof.

Purpose of the study. This research aims to examine the Prüm II Regulation by applying the set of conditions and procedures for the automated searching of DNA⁶ given by that framework and to achieve a comparative analysis to assess the level of obedience with national rules in contrast to the Prüm II Regulation.

Methodology. The aim of this research is expected to be achieved employing a legal dogmatic way to analyze cross-border data exchange under the Prüm II Regulation, focusing on the legal framework and its effects on national law of Member-States of the EU (de lege lata) and potential future changes (de lege ferenda) in need. The method will assess both traditional legal dogmatics and legal analytical methods, using a comparative context, including empirical research to explore potential problems. And, the article consults potential revisions to handle these matters from a de lege ferenda outlook.

Main content. The challenges of Council Decision 2008/615/JHA in Prüm II Regulation (EU) 2024/982. Amended Council Decision 2008/615/JHA⁷ by Regulation (EU) 2024/982⁸ known as the Prüm II Regulation, introduces significant enhancements to the automated search and exchange of data as well as sets constraints for the interaction of critical data following an inveterate match of biometric data, easing timely and precise knowledge dissemination among law enforcement instruments.

Significantly, article 14 of Council Decision 2008/615/JHA concentrates on the motorized deal of information between Member States for police cooperation. Accordingly, article 14 of Council Decision 2008/615/JHA refers to the swap and use of personal data between EU member states to prevent crimes and keep public mandate and security, particularly during major events with a cross-border aspect, like sporting events or European Council summits. Interestingly, Member States are demanded to disseminate personal data either upon request or voluntarily if there is a cause to acknowledge that a person might earmark a crime or pose a danger at such events. The sharing of data is allowed when there is a right reason, such as prior criminal convictions or other occurrences showing that the person could be a safeness threat in these affairs. However, this data exchange is only entitled if the nationwide laws of the supplying country allow it. Personal data can only be operated for the specific purpose of event security outlined beforehand, i.e., stemming crimes and possessing public order at the event. An important guarantee is that the data must be deleted immediately once it is no elongate needed for the stated sense, or within one year at the most delinquent. This practice aims to sweeten security at prominent events by sharing appropriate individual information to contain crimes, but it also

⁶ Key terms (retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=legisum%3Ajl0005https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=legisum%3Ajl0005>): Non-coding part of DNA - chromosome regions that are not expressed genetically, i.e. not known to provide for any functional properties of an organism. Automated searching - an online access procedure for consulting the databases of one, several or all of the Member States. DNA profile - a letter or number code that represents a set of identification characteristics of the non-coding part of an analysed human DNA sample. Hit/no-hit procedure - parties grant each other limited access to the reference data in their national DNA and fingerprint databases. They also grant the right to use this data to conduct automated checks of fingerprints and DNA profiles. The personal information related to the reference data is not available to the requesting party. Non-personal data - data containing individual DNA profiles that may be used to establish a match or a hit, but that does not reveal the identity of the data subject.

⁷ Council Decision 2008/615/JHA of 23 June 2008 on the stepping up of cross-border cooperation, particularly in combating terrorism and cross-border crime OJ L 210, 6.8.2008, p. 1-11 (consolidated version as of April 25, 2024).

⁸ Supra note 1.



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ÉCHANGE DE DONNÉES ADN ENTRE LES ÉTATS MEMBRES DE L'UE SELON RÈGLEMENT PRÜM II»

Résumé : Le profilage ADN joue un rôle clé dans l'identification de la personne impliquée dans un crime. Il permet également d'identifier les relations génétiques entre les populations éloignées, ce qui peut aider à l'identification et à la divulgation des crimes transfrontières. L'étude dispose d'un cadre réglementaire régissant l'échange d'ADN entre les États membres de l'UE en vertu du règlement Prüm II. Étant donné que la réglementation facilite l'échange d'ADN à des fins répressives, les législations nationales des États membres devraient veiller à ce qu'elles soient respectées. En comparant le cadre juridique en la matière, l'étude souligne la nécessité d'harmoniser les bases de données pour un partage efficace et sécurisé des données ADN dans les enquêtes pénales.

Mots-clés : génomique, profils ADN, bases de données ADN, cibles des forces de l'ordre, criminalité transfrontière et terrorisme.

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WYMIANA DANYCH DNA MIĘDZY PAŃSTWAMI CZŁONKOWSKIMI UE NA MOCY ROZPORZĄDZENIA PRÜM II

Profilowanie DNA odgrywa kluczową rolę w identyfikacji osób zamieszanych w przestępstwa. Pozwala ono również na ustalenie powiązań, takich jak relacje genetyczne między odległymi populacjami, co może pomóc w identyfikacji przodków przestępców i rozwiązywaniu spraw dotyczących przestępstw transgranicznych. Badanie dotyczy ram regulacyjnych regulujących wymianę danych DNA między państwami członkowskimi UE na mocy rozporządzenia Prüm II. Biorąc pod uwagę, że rozporządzenie ułatwia wymianę danych DNA do celów egzekwowania prawa, prawo krajowe musi zapewnić zgodność z nim. Porównując ramy prawne w tej kwestii, w badaniu podkreślono potrzebę harmonizacji baz danych w celu zapewnienia skutecznej i bezpiecznej wymiany danych DNA w dochodzeniach karnych.

Słowa kluczowe: genomika; profile DNA; bazy danych DNA; egzekwowanie prawa; przestępczość transgraniczna i terroryzm.

charges inflexible necessities on the service and elision of the data to cover individuals' privacy rights on the other hand.

With the warm-up of Prüm II Regulation, the scope of data hidden under this article has been greatly inflated. Formerly, the data classifications for interaction were limited to DNA silhouettes, fingerprint data, and conveyance signup attributes. But also introduces updated conditions and procedures for the automated searching of all these data types as DNA profiles (section 1 chapter 2 of the regulation), dactyloscopic data (section 2 chapter 2 of the regulation), and police records (section 3 chapter 2 of the regulation). This expansion confirms that law enforcement agencies have access to a more comprehensive data set, helping to identify suspects and track criminal activity more swiftly and accurately across EU borders. The Prüm II Regulation still also uses those categories and widens this to incorporate data sorts as facial images (section 4 chapter 2 of the regulation) and police archives (including respect numerals of suspects and sentenced lawbreakers) (section 5 chapter 2 of the regulation). These new data varieties are now included in the automated pursuit and dialogue framework.

DNA profiles. Genomics is the study of whole genomes of organisms, and incorporates elements from genetics and it differs from 'classical genetics' in that it considers an organism's full complement of hereditary material, rather than one gene or one gene product at a time⁹. The well established regulation especially relevant in the era of CRISPR-Cas9 DNA editing technologies¹⁰, which can be used to rework the genome of any live organism, facilitating the exact cutting and pasting of DNA by technological proteins.

Based on Article 4 of the discussed Regulation DNA profile' means a letter or number code which represents a set of loci or the particular molecular structure at the various loci where loci' (singular: 'locus') means DNA locations containing identification characteristics of an analysed human DNA sample. Whether or not a crime-relevant major contributor profile can be established from a floor sampling is, of course, subject to stochastic processes¹¹. The evidence of aDNA would suggest, however, no matter how much identity is a social construct, the earliest Beaker populations would be aware that their genetic ancestors lay elsewhere across the sea and not with the population that they were apparently extinguishing¹². The link between the definition of "DNA profile" and the image of ancient human migration, as defined with reference to aDNA (ancient DNA), can be clarified. Since the loci are specific to individuals or populations, thus, the profile represents this set of molecular structures in the form of a code (typically letters or numbers) where under the discussed norm DNA profiles are utilized to identify individuals or specify ties to crime scenes. Nevertheless, whether or not a dedicated and crime-relevant profile can be inducted from a sample is subject to stochastic processes, signifying that randomness and variability can affect whether a clear and useful DNA profile is obtained from a sample, particularly if it's spoiled or insufficient. Hence, the notion of selfhood in genetics is not just about the current state of individuals, but also about comprehending the ancestral associations of inhabitants.

The proposed message about the Beaker populations guides to the idea that early human groups, even thousands of years ago, may have admitted that their genetic origins lay with outlying populations (across the sea), even though they might not have seen themselves as part of the same social group as those populations they interacted with. Ancient DNA (aDNA) has become an essential tool in apprehending the migrating prints and genetic bonds of ancient populations. The identification of distinct loci in aDNA profiles of ancient humans delivers the genetic relationships between populations,

⁹ European Bioinformatics Institute (EMBL-EBI), What is genomics? Retrieved from <https://www.ebi.ac.uk/training/online/course/genomics-introduction-ebiresources/what-genomics>

¹⁰ See Sternberg, S. H., LaFrance, B., Kaplan, M., & Doudna, J. A. (2015). Conformational control of DNA target cleavage by CRISPR-Cas9. *Nature (London)*, 527(7576), 110-113. <https://doi.org/10.1038/nature15544>; Xue, C., & Greene, E. C. (2021). DNA Repair Pathway Choices in CRISPR-Cas9-Mediated Genome Editing. *Trends in Genetics*, 37(7), 639-656. <https://doi.org/10.1016/j.tig.2021.02.008>

¹¹ NEVES, C., & ZIEGER, M. (2023). "Total Human DNA Sampling" - Forensic DNA profiles from large areas. *Forensic Science International : Genetics*, 67, p

¹² Kristiansen, K., Kroonen, G., & Willerslev, E. (Eds.). (2023). The Indo-European puzzle revisited : integrating archaeology, genetics, and linguistics (1st ed.). Cambridge University Press. p. 138



revealing migration patterns, genetic continuity, and even interactions between groups. The observation of identity being a “social construct” concedes those trendy understandings of uniqueness—such as nationwide, ethnic, or social essence—are often shaped by cultural and historical facets. Yet, genetic evidence, such as the analysis of DNA profiles, can show that the biological connections between groups may differ from how those groups define themselves socially. The Beaker populations might have considered themselves different from other groups, but genetic analysis could suggest links between them and populations from distant locations across the sea, challenging the perception of social boundaries.

In essence, the connection between the regulation’s technical description of DNA profiles and the discussion of aDNA in ancient populations highlights the dual role of DNA in both co-occurring law enforcement and historical genetic research. While the regulation concentrates on operating DNA profiles for a legal tag, the more all-around context of DNA (such as aDNA studies) recommended uncovering historical certitudes about human migration, social identity, and the deep-rooted genetic relationships that extend above contemporary social constructs that are relevant to crime combat. While aDNA may not straight influence present crime warfare, comprehending historical migration patterns or recognizing ancient human bonds have forensic applications. For example, it can help pinpoint the roots of genetic attributes found in modern populations, which could be applicable in tracing criminal ancestry, or solving crimes affecting people from distant surroundings or territories¹³.

According to Article 5 of the Prüm II Regulation commission shall adopt an implementing act to specify the identification characteristics of a DNA profile which is to be exchanged. This would include specialties like attributes of data that need to be contained in the DNA profile for it to be identifiable and functional across walls, the technological configuration in which the DNA profile should be presented or disseminated to assure consistency and exactness when intercommunicated, quality bars that need to be met for the DNA profile to be right in global dialogues. Importantly, DNA reference data shall be processed under (1) the discussed Regulation and (2) in compliance with the national law pertinent to the processing of those data. According to Article 6 where motorized tracking shows that a delivered DNA profile matches DNA profiles stored in the requested Member State’s searched database or databases, the national contact point of the requesting Member State shall receive in an automated manner the DNA reference data with which a match has been found.

To make it possible the Regulation gives the reference data explanation that helps ensure that DNA profiles are properly linked with pertinent information, such as the polity of genesis, the designation status of the profile, and the command to retrieve extra data when a match transpires. At this stage important to note some characteristics about police records such as: (1) participation in the automated exchange of police records is optional, (2) police records are biographical data of suspects and convicted persons, pseudonymized for data protection, (3) searches are allowed for the prevention, detection and investigation of criminal offences punishable by at least 1 year of imprisonment under the law of the requesting Member State, (4) searches are conducted in accordance with the national law of the requesting Member States and only in individual cases.¹⁴

This system boosts efficient and collective data sharing between Member States and Europol, enriching cross-border law enforcement actions, and includes (1) a reference number for Member States that allows a Member State to regain additional data from their nationwide DNA database if a match is found. This data can then be transferred with one or more other Member States or with Europol;¹⁵ (2) a reference number for Europol that authorizes Europol to retrieve further data when a match occurs, specifically for Article 48(1) of the Prüm II Regulation. Europol can then share this data with one or more Member States in line with Regulation (EU) 2016/794 about Europol’s processes and data processing; (3) code to indicate the Member State holding the profile that confines which EU Member State holds or supervises the DNA profile. This is useful for tracking where the data originated from and helps sustain translucence in data sharing; (4) code to indicate whether the profile is identified or unidentified. This code stipulates whether the DNA profile reaches an identified individual (for example, a known person or suspect) or an unknown profile (such as a profile found at a crime scene with no comprehended person). This credit is important for how the profile is employed and conveyed in inquiries.

According to Article 45 Each partaking Member State and Europol must keep logs of all the functions achieved in the EPRIS system.¹⁶ The logs must incorporate the following details: (1) whether the demand for questioning was cast by a Member State or Europol. If it was a Member State, the clear country must

¹³ In this regard there are legal discussions belting phenotypic DNA testing and familial DNA testing. Under the Prüm II Regulation these new techniques raise concerns when phenotypic testing may lead to profiling based on physical traits and while familial DNA has solved many cases, it risks implicating innocent family members.

¹⁴ Summary of Regulation (EU) 2024/982 on the automated search and exchange of data for police cooperation. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=LEGISSUM:4751706>

¹⁵ See Article 49(6)).

¹⁶ The Prüm II Regulation sets the European Police Record Index System (EPRIS) in accordance with the privacy-by-design principle focuses on prison governance and the reintegration of outlaws into society, transferring data told their time in penitentiary and rehabilitation measures (see more at <https://www.statewatch.org/media/documents/news/2009/dec/eu-council-agie-epris-15526-rev2-09.pdf>). Also need to keep in mind about the European Criminal Records Information System (ECRIS) that concentrates on criminal records and the dialogue of details about convictions across EU member states (see more at https://commission.europa.eu/law/cross-border-cases/judicial-cooperation/tools-judicial-cooperation/european-criminal-records-information-system-ecris_en).



be recalled; (2) the precise span when the questioning was assembled; (3) the actual time when the retort was obtained; (4) the Member States or Europol must document which nationwide DNA databases the questioning was sent to; (5) the log must also form which national databases delivered a comeback to the questioning; (6) each Member State must preserve logs for questionings made by official personnel of their competent authorities employing EPRIS; (7) similarly, Europol must hold logs for questionings made by its officials.

The Article 47 sets rules of exchange core data, particularly when there is a match between data used for a question and data kept in another Member State's database.¹⁷ Significant, core data must be produced within 48 hours of a match being authorized,¹⁸ provided that the match between the examination data and the kept data in the database of the asked Member State is proved according to formulae of Articles 6, 11, or 20. The match is manually affirmed by a competent team from the requesting Member State, or the asked Member State for DNA profiles with the evaluation of the proportionality in accordance with national law. The requesting Member State in the matter of DNA profiles is accountable for returning the core data after a verified match. Hence, the return of core data is subject to human decision-making, ensuring that the exchange of information is properly evaluated and managed by a person, rather than automated systems.

Significantly also the logs are mainly operated for the array of statistics about the system's use, and data defense monitoring, including assuring questionings are allowable and licit, guaranteeing data safeness and integrity in the processing of data. Also, data controllers (the authorities responsible for managing the data) must retain credentials to these logs for self-monitoring purposes. This is to ensure the legitimacy of the data processing and the admissibility of the questionings, as mentioned in Article 55 of the Regulation.

The compliance of Member States national law with cross-border DNA exchange. According to the 2018th report of a Science for Policy report by the Joint Research Centre (JRC), the European Commission's science and knowledge service, the most comprehensive coverage of issues relating to genetics, and embryonic research is probably to be found in Switzerland.¹⁹ Swiss legislation provides a good example of a truly wide-ranging engagement with genetics, encompassing the Swiss Federal Act on Research Involving Embryonic Stem Cells (2003) and Federal Act on Human Genetic Testing (2004) and the Federal Act on Research Involving Human Beings (2011).²⁰

The other jurisdictions which have a comprehensive coverage of issues are: Norway, Lithuania,²¹ Latvia, Portugal,²² Estonia²³ and Hungary.²⁴ These jurisdictions have enacted bespoke genetic research laws, which engage deeply with the issues of genetic research, embryo research and genetic testing.²⁵ The laws specify the time limitations on how long an embryo can be used in research and provide for prohibitions on germ-line alterations.²⁶

Jurisdictions which have only few legislative instruments relating to genetics, and the instruments enacted focus mainly on the environment and Genetically Modified Organisms ('GMO'), are: Bulgaria, Czech Republic, Slovakia, Greece, Ireland and Poland.²⁷

For member states like Austria, the enactment of Prüm II is driven by the national ruling the collection, storage, use, and sharing of genetic data. Here's how Austria's strength provides obedience with Prüm II founded on the national laws in the table 'Summary of details of criminal legislations relating to genetics. Firstly, the Criminal Procedure Code (StPO) qualifies the use of genetic data from suspects and detainees for specific intents. Prüm II Regulation ought to align with these fetters, ensuring that genetic data is shared

¹⁷ Where the confirmed match concerns identified data of a person, the set of core data shall contain the following data to the extent that they are available: (a) first name or names; (b) family name or names; (c) alias or aliases and previously used name or names; (d) date of birth; (e) nationality or nationalities; (f) place and country of birth; (g) gender; (h) the date on which and the place where the biometric data were acquired; (i) the criminal offence for which the biometric data were acquired; (j) the criminal case number; (k) the competent authority responsible for the criminal case.

Where the confirmed match concerns unidentified data or traces, the set of core data shall contain the following data to the extent that they are available: (a) the date on which and the place where the biometric data were acquired; (b) the criminal offence for which the biometric data were acquired; (c) the criminal case number; (d) the competent authority responsible for the criminal case.

¹⁸ If a Member State demands judicial license under its national law to equip a set of core data, it can deviate from the 48-hour deadline to fetch the critical authorization.

¹⁹ JRC F7 - Knowledge Health and Consumer Safety, Overview of EU National Legislation on Genomics, JRC Science for Policy Report, Luxembourg: European Commission, EUR 29404 EN, ISBN 978-92-79-96740-5, PUBSY No. JRC113479, p. 9.

²⁰ Ibid.

²¹ The Law on Artificial Fertilisation (2014): the law prohibits the use of IVF as a means of modifying the identity of the germ line of a person or their offspring. The Law on Ethics in Biomedical Research (2002): the law provides further that human cloning is prohibited; and biomedical studies which modify the human genome may only be carried out for the purposes of prevention, diagnosis or treatment and only in cases where they are not intended to modify the progeny genome (the germ line).

²² The Law no 12/2015 of 26 January on Personal Genetic Information and Health Information: the Law prohibits the alteration of the human germ line.

²³ The Artificial Insemination and Embryo Protection Act (1997): the Act prohibits the sex selection of embryos in IVF procedures except where there is a high probability of occurrence of a genetic disease linked to the sex chromosome. It is also prohibited to clone embryos or fuse the genetic information of embryos in order to create a cell fusion, if one of the embryos is a human embryo.

²⁴ Supra note 19.

²⁵ Ibid.

²⁶ Ibid.

²⁷ Ibid.



only for the legitimate purposes depicted under both national and EU law. Secondly, the Aliens Police Act 100/2015 where set DNA may be used in fixed cases to confirm identicalness or familial affinities, primarily in the context of family migration. Prüm II demands transformations to confirm surface in the handling of DNA data across borders, notably for identity proof and family connections in migration subjects. Thirdly, Border Control Act 435/1996 which is comparable to the Aliens Police Act allows for DNA verification in straightforward immigration contexts. For compliance with Prüm II, Austria ought to confirm that genetic data transmitted with other EU states is invariant with both border reign and criminal examination conditions. Fourthly, Citizenship Law 311/1985 qualifies for the use of DNA in certain interchangeability verification strategies. Prüm II would affect how Austria conveys DNA data bonded to citizenship affairs with other EU member states.

Thus, the Prüm II Regulation directs that Austria, like other member states, must design a scheme for the exchange of DNA profiles with other EU countries. This means that Austria's national laws, like those in the Criminal Procedure Code or the Aliens Police Act, need to be blended to simplify this dialogue. This retains guarantees that DNA data is protected during its display, storage, and sharing within the EU framework induced by Prüm II. The regulation will likely require Austria to ensure that its nationwide DNA database is compatible with other EU member states' methods. Besides, given the sensitive nature of genetic data, Austria will need to demonstrate or strengthen oversight mechanisms to assure that any interaction of DNA information relates to both national constitutional rights and EU laws under Prüm II.

Next, let's see how Croatia, the Czech Republic, and Denmark may align their nationwide lawmaking with the Prüm II Regulation.

The Criminal Procedure Code in Croatia already sets out policies for the handling, access, storage, and destruction of DNA samples during criminal investigations. Under Prüm II, Croatia would need to implement efficient techniques for sharing DNA profiles following Prüm II's guidelines on data exchange. Likewise, the Prüm II requires that DNA data be shared within the framework of strict legal methodologies. Hence, it is necessary to adjust its consent protocols and access control mechanisms. Also, since Prüm II includes provisions for how long data can be enclosed and when it should be exterminated it means Croatia will have to harmonize its data retention and defeat policies accordingly.

The Penal Code in the Czech Republic already includes provisions that regulate the use of genetic data and include penalties for the unlawful handling of genetic facts, significantly correlated to confidentiality breaches. This aligns well with the Prüm II Regulation, which emphasizes the protection of personal data. Moreover, the Czech Penal Code bans the misuse of genetic information, which will secure that DNA data shared under Prüm II is covered against breaches of confidentiality and unauthorized access. At the same time, the Czech Republic could involve revising the legal framework to permit the exchange of DNA profiles under specific states. Like Croatia, the Czech Republic is directed to specify safeguards and compliance mechanisms to protect data integrity and privacy during the sharing of genetic data with other EU states.

Law on Processing of Personal Data by Law Enforcement Authorities No. 410 (2017) of Denmark governs how police and associated authorities can process personal data, including genetic knowledge. Denmark already has a central DNA profile register established under the Act on Establishment of a Central DNA Profile Register (2000). This register will need to be aligned with Prüm II to ensure that DNA data can be shared virtually with other EU countries. This demands updates for data obtainable for cross-border criminal investigations and that it adheres to Prüm II's rules on data security, storage, and retention, and the protection of individual privacy when conveying DNA data.

In Estonia under the Forensic Examination Act (2001) the National DNA Database qualifies for the assemblage and storing of DNA from internees and suspects in criminal topics and already aligns with the goals of the Prüm II Regulation, as it assures the ability to share DNA information with other EU Member States. Also, the Imprisonment Act (2000) haggles with the handling of prisoners' DNA samples. Regardless, to comply with Prüm II, the database must confirm that data can be swapped securely with other EU databases and following privacy-respecting exchanges.

Let's assess compliance in Finland. Firstly, the Penal Code discourses genetics-related offenses, including cloning, varying human germ compartments, and circulating GMOs in violation of the Gene Technology Act. Hence, the Penal Code concentrates on prohibitions and penalties, which do not directly move the genetic data exchange under Prüm II. However, Finland's criminal legislation is important in the context of criminal activities related to genetics, likewise, unauthorized manipulation of human genetics is punishable, and, therefore, intersects with Prüm II's goal of criminal righteousness collaboration. Secondly, the Coercive Measures Act holds the occurrences under which DNA can be amassed from criminal suspects, and how such samples are to be handled, stored, and destroyed. This Act aligns sufficiently with the DNA exchange provisions of Prüm II. As set in the Act if DNA samples are collected in compliance with national law, Finland is able to share DNA data with other Member States' DNA databases.

The Penal Code in France recaps genetic-related offenses, including breaches of biomedical ethics and provisions related to probing a person's genetic differentiae. By sustaining legal trims around the use of genetic data and guaranteeing criminal penalties for breaches, France's Penal Code is feasible to align with the data protection and ethical middles required by Prüm II. Importantly, the Code appoints the national robotic DNA file and specifies its operation and credentials. France's result of a national DNA file aligns word-for-word with Prüm II's goal of enabling Member States to exchange DNA data. The French law occurs to be in line with the Prüm II Regulation.



Table on Summary of details of criminal legislations relating to genetics ²⁸

COUNTRY	LAW	ACCESS / NOTES
Austria	Criminal Procedure Code	The Act limits the use of genetic data collected from suspects and convicts to the purpose.
	Aliens Police Act 100/2015	The Act provides for public authority powers in some very limited circumstances to check a person's DNA to confirm their identity, especially to prove a familial relationship in cases of family migration.
	Border Control Act 435/1996	The Act provides for public authority powers in some very limited circumstances to check a person's DNA to confirm their identity, especially to prove a familial relationship in cases of family migration.
	Citizenship Law 311/1985	The Act provides for public authority powers in some very limited circumstances to check a person's DNA to confirm their identity, especially to prove a familial relationship in cases of family migration.
Croatia	The Criminal Procedure Code	The Code provides for how DNA is to be handled during and after criminal investigations and which persons have the authority to access the genetic data, when the data are to be destroyed and what consents are necessary from the subject of the investigation.
Czech Republic	Law N. 227/2006 (The Penal Code)	The Code specifies certain acts as offences; these include handling and using human genetic information in prohibited ways. These prohibited acts relate especially, to breaches of confidentiality.
Denmark	The Law on processing of personal data by law enforcement authorities No. 410 of 27/4/2017	The Law regulates how police and associated authorities can process personal data.
	The Act on Establishment of a central DNA profile register No. 434 of 31/5/2000	The Act establishes a central DNA profile register.
Estonia	The Forensic Examination Act (2001)	The Act establishes a National DNA Database for storing and collecting DNA of prisoners and suspects in criminal matters.
Finland	The Imprisonment Act (2000)	The Act provides for the way prisoners' DNA samples are to be handled.
	The Penal Code	The Code specifies offences related to genetics. It is an offence to clone human, altering and generating human germ cells and animal genetic material and the generation of a human by combining embryos. These offences are punishable by imprisonment of up to 2 years. It is also prohibited to intentionally spread GMOs in violation of the Gene Technology Act and export GMOs without a licence.
	The Coercive Measures Act	The Act provides for situations when DNA can be collected from criminal suspects and specifies how the samples and any resulting data are to be handled, stored and destroyed.
France	The Penal Code	The Code outlines numerous offences related to genetics when a person breaches provisions relating to examination of a person's genetic characteristics and breaches provisions of biomedical ethics. The Code also provides and establishes the national automated DNA file and provides how it shall be operated and who has access to the information thereby contained.
Germany	The Code of Criminal Procedure (1987)	The Code provides for how DNA is to be used in the context of criminal investigations, it limits the scope of genetic analysis which can be performed on samples and specifies how DNA samples can be collected and when consent for collection is not necessary.
Hungary	The LXVI Law on the Registration of Citizen's Personal Data and Address (1992)	The Law provides for DNA procedures in criminal context It specifies when DNA samples can be taken from suspects or convicted persons, how and when DNA samples must be registered and how DNA can be shared with other EU countries. The Law also provides for how long DNA is kept in the database and how it is to be stored.

²⁸ Supra note 19, pp. 16-20, Table 4.



Iceland	The Law on Genetic Register of Police (2001)	It establishes the Icelandic DNA database for storing and comparing DNA of suspects and convicts. The Law specifies when and how DNA can be collected, when must it be destroyed, who can have access to the information; and provides that the Data Protection Authority shall ensure proper administration of the database and protect the privacy of the individuals whose information is contained in the database.
Ireland	Criminal Justice (Forensic Evidence and DNA Database System) 2014 Act	The Act establishes the DNA database, as well as the framework for when DNA samples can be taken from suspects and the procedures for collection, storage and handling of the samples and any resulting data.
Latvia	The Law on Development and Use of National DNA Database (2004)	The law establishes a national DNA database to record criminal offences; the Law also regulates the exchange of the results of GNA genetic analysis with other States and international organisations.
Lithuania	The Police Law (2000)	The Law authorises relevant officials to take samples of genetic material without consent for comparative study and identification purposes
	The Law on the Approval, Entry into Effect and Implementation of Criminal Procedure (2002)	The Law provides when suspects' genetic information can be taken, despite the lack of consent of the suspect.
Luxembourg	The Penal Code	It provides for the use of DNA in the context of criminal proceedings. It specifies when DNA samples can be collected from suspects or convicts and the exact procedure of doing so. It provides for the protection of all DNA data collected and how the samples are to be stored and handled.
Malta	The Criminal Code (1854)	The Code specifies who can collect DNA in criminal proceedings and when DNA can be transmitted outside Malta
Netherlands	The Code of Criminal Procedure of 15 January 1921	The Code provides for when DNA samples can be taken with and without consent from suspects; and specifies the collection procedure, handling and analysis of all DNA samples in the context of a criminal investigation and/or proceeding.
	Law on DNA and Convicted Persons of 16 September 2004	The Law provides further details on how DNA analysis is to be carried out in the context of a criminal proceeding and specifies when collections of DNA samples are allowed.
Portugal	The Law no 5/2008 of 12 February on the DNA Profile Database – Civil and Criminal Identification	The Law regulates how the DNA data is to be stored and handled and what safety measures must be in place and for what purposes can DNA be collected.
Romania	Code of Criminal procedure of 1 July 2010 (Law 135/2010)	The Law outlines when genetic samples can be taken in the context of criminal proceedings and/or investigation.
	The Law no. 76 of 8 April 2008 on the organisation and operation of the National System of Judicial Genetic Data	The Law establishes the National System of Judicial Genetic Data and sets out the conditions under which DNA samples can be taken from suspects and convicts; and how the data is to be processed and stored.
Slovakia	Criminal Law 300/2005	The Law prohibits the creation of a genetically identical human being to another one alive or dead. It is also an offence to breach the laws relating to GMOs and genetic technologies.
Slovenia	Law on Police Orders and Authorisations (2013)	The Law provides limits on police powers. It stipulates a principle of equal treatment prohibiting police offices to discriminate against anyone on the grounds of genetic heritage (Art 14).
Spain	Penal Code	The Code provides for when DNA samples can be taken for suspects and convicts; and outlines the procedures for collecting, storing and destroying DNA. The Code creates several offences relating to genetic information modification. Genetic modification in humans is prohibited for all purposes, except for those where the aim is to eliminate or reduce defect or serious disease. Breach of this provision carries a prison sentence. As per section 160, the use of genetic engineering to produce biological weapons is prohibited and punishable by imprisonment. It is prohibited to fertilise human eggs for any other purpose than for human reproduction; this provision carries a custodial sentence. The creation of genetically-identical humans (clones) is prohibited and will be punished by imprisonment.



United Kingdom The Police and Criminal Evidence Act 1984

The Act regulates when DNA profiles can be included on the National DNA Database in the context of criminal investigations and/or proceedings. The Act specifies when DNA samples and profiles can be destroyed and provides that the National DNA Database Strategy Board must make arrangements for the database operations.

From the given table 'Summary of details of criminal legislations relating to genetics' is seen that countries Germany, Hungary, Iceland, Ireland, Latvia, Lithuania, Luxemburg, Malta, Netherlands, Portugal, Romania, Slovakia, Slovenia, Spain, United Kingdom have set frameworks for DNA grouping and use in criminal breakdowns, with running decks of ordinance for data storage, sharing, and authorization methodologies. These laws align with the Prüm II Regulation to ranging dimensions, with some countries accentuating data exchange and retention approaches. Some polities like Slovakia and Slovenia concentrate more on ethical care and restraints, likewise, outlawing cloning or prejudice founded on genetic genealogy, while others, such as Spain and the UK, have ample frameworks for DNA databases and overseeing criminal issues.

Conclusions. Member states are in need to ensure that their national DNA databases are compatible with the EU-wide Prüm II framework and that they are able to communicate with those of other member states for the exchange of data like DNA profiles. Also Prüm II regulates how long DNA data can be retained and, therefore, need the check-mechanism of how retention align with these requirements. Besides, while Prüm II allows the exchange of DNA data between member states for criminal justice purposes, each country must guarantee that proper controls and consent mechanisms are in place. Hence, national laws regarding who can access DNA data and under what conditions will be crucial for compliance with Prüm II. This includes ensuring secure data sharing systems, aligning DNA retention and destruction practices, and maintaining high standards of data protection and privacy.

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