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Organizational Principles Of The Use Of Forensic DNA Analysis In The Investigation Of Criminal Offenses

This article studies organizational principles of forensic DNA analysis as the area of practical activities in the field of detection and investigation of criminal offenses. The author defined the list of organizational principles of forensic DNA analysis, disclosed their content, and determined the conditions for implementation in Ukraine. It was established that such principles are the legality, the exclusively procedural form of using DNA analysis in criminal proceedings, the functioning of forensic accounting of human genomic information, the formation of DNA analysis as a separate section of forensic technology, its organizational and technical support.

Keywords: criminalistics, forensic science, criminal proceedings, investigation of criminal offenses, DNA analysis, forensic technology.

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The author declare that they have no conflict of interest.

Research Problem Formulation. Since the mid-1980s of the last century, DNA analysis technologies have firmly entered the arsenal of forensic science around the world. This branch of forensic science has demonstrated remarkable results in the case of human identification based on biological material, providing law enforcement officers with effective methods of searching for unknown criminals, identifying unrecognizable corpses, etc. The arsenal of tools and methods of forensic DNA analysis is constantly expanding.

In Ukraine, the relevant technologies have been used in the practice of forensic examination institutions since the 1990s. However, comprehensive scientific research in this direction has not been conducted until now. In fact, there are still no clear ideas about the possible directions of using DNA analysis in the detection and investigation of criminal offenses, the limits of permissible interference in the personal and family life of citizens during forensic DNA research, the rules for handling biological traces and samples, the peculiarities of evaluating the conclusions of molecular genetic examination and their use in proof. Therefore, identifying and defining the main organizational aspects of the use of forensic DNA analysis in the detection and investigation of criminal offenses is an urgent scientific problem.

Analysis of Recent Researches and Publications. In recent years, scientific research in the field of forensic DNA analysis has significantly intensified in Ukraine. However, scientists mainly analyze the problems of legal regulation of this area, increasing the efficiency of the national DNA database and certain methodological aspects of conducting molecular genetic research. In turn, the organizational aspects of the use of DNA analysis at the stage of pretrial investigation of criminal offenses were only partially considered by R. L. Stepaniuk, V. V. Ionova, M. H. Shcherbakovskiy, V. O. Husieva, S. I. Perlin, V. V. Kikinchuk, B. M. Hamaliuk, I. T. Khodyrieva, P. Davydiuk, I. Peleshok, M. Yakymchuk, I. O. Kostenko, K. V. Kyrpychova



and other authors in the context of the problems of appointment of molecular genetic examination, including in wartime conditions¹.

Article Purpose is the analysis of the organizational principles of the use of forensic DNA analysis in the activity of uncovering and investigating criminal offenses. To solve this goal, the following tasks were set: to determine the list of organizational principles of forensic DNA analysis, to reveal their content, and to determine the conditions for their implementation in Ukraine.

Main Content Presentation. It is widely known that investigators and prosecutors use specific expertise in criminal proceedings in two forms - organizational and procedural. The organizational form is not regulated by the norms of criminal procedural legislation, and therefore it is often called non-procedural, while the procedural form has the appropriate legal regulation and is primarily expressed in the involvement of a specialist in the conduct of certain procedural actions and the involvement of a court expert.

The capabilities of DNA analysis significantly exceed most other fields of forensic technology and forensic examination, which is primarily due to the fundamental scientific basis for determining the accuracy of DNA identification results and the extraordinary effectiveness of searching for unknown suspects by biological traces, provided a high-quality forensic DNA database is available. But in this area there are also significant problems related to legal and ethical considerations regarding the interference of law enforcement officers in a person's private life, overestimation by investigators, prosecutors and judges of the probative value of the results of DNA analysis, failure to take into account factors that in practice can lead to erroneous results, etc.

Currently, forensic molecular genetic examination is rapidly developing in Ukraine, the need for which has increased significantly with the beginning of hostilities². Domestic scientists tried to assess the current state of the use of its results in the investigation of criminal offenses in Ukraine and noted the existence of significant problems of a legal, organizational, and methodological nature. In particular, with regard to organizational problems, the weakness of the filling of the national DNA database, inconsistency in determining the place of molecular genetic examination in the system of forensic examinations, gaps in training and technical support of law enforcement officers who

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This article studies organizational principles of forensic DNA analysis as the area of practical activities in the field of detection and investigation of criminal offenses. The author defined the list of organizational principles of forensic DNA analysis, disclosed their content, and determined the conditions for implementation in Ukraine. It was established that these principles are: legality, that is, strict compliance with the requirements of the law at all stages of collecting and researching biological material, using and storing genomic information; an exclusively procedural form of using DNA analysis in criminal proceedings; proper functioning of forensic accounting of human genomic information; formation of DNA analysis as a separate section of forensic technology; its organizational and technical support, which primarily involves the accreditation of forensic genetics laboratories according to the European quality standard and compliance with the conditions regarding technical equipment and personnel support. It is substantiated that the implementation of these principles necessitates the need to take a number of regulatory and organizational measures at the national level to ensure at least the minimum conditions for the effective use of forensic DNA analysis technologies, namely: to improve legal norms at least in the aspect of regulation of procedures for obtaining biological material, management of DNA databases and protection of genomic information; determine exclusively the procedural form of using DNA analysis in the criminal process, regulating, in addition to molecular genetic examination, verification studies; to intensify scientific research in the field of criminalistics in the direction of DNA analysis and to introduce relevant topics into educational programs for the training of lawyers and law enforcement officers; to coordinate the work of various DNA analysis laboratories in the context of their accreditation, technical equipment with compatible equipment and personnel training.

¹ Давидюк П., Пелешок І., Якимчук М. Сучасний стан розвитку молекулярно-генетичної експертизи в Україні. *Науковий вісник Ужгородського національного університету*. Серія: Право. 2023. № 75. Т. 2. С. 171-176; Степанюк Р. Л., Іонова В. В. Призначення судової молекулярно-генетичної експертизи на стадії досудового розслідування: проблеми та шляхи їх вирішення. *Вісник Луганського державного університету імені Е.О. Дідоренка*. 3 (91). 2020. С. 307-319; Stepaniuk R., Shcherbakovskiy M., Kikinchuk V., Lapta S., Husieva V. Problems of using forensic molecular-genetic examination in criminal procedure of Ukraine. *Georgian medical news*. 2019/5. № 290. С. 157-163; Stepaniuk R. Forensic DNA Analysis: Development State and Prospects in Ukraine. *Theory and Practice of Forensic Science and Criminalistics*. 2021. V. 25(3). P. 60-80. <https://doi.org/10.32353/khrife.3.2021.05>; Костенко І. О., Кирпичова К. В. Проблемні питання проведення молекулярно-генетичної експертизи та шляхи їх вирішення. *Актуальні питання криміналістики та судової експертизи: матеріали Всеукр. наук.-практ. конф. (Київ, 19 листоп. 2020 р.)* / [редкол.: В. В. Черней, С. Д. Гусарев, С. С. Чернявський та ін.]. Київ : Нац. акад. внутр. справ, 2020. С. 217-220 ; Гамалюк Б. М., Ходирєва І. Т. Окремі питання правового регулювання судової молекулярно-генетичної експертизи та обліку генетичних ознак людини. *Вісник Луганського державного університету внутрішніх справ імені Е.О. Дідоренка*. 2022. № 2(98). С. 190-201; Степанюк Р. Л., Кікінчук В. В. Напрями вдосконалення правового регулювання криміналістичного ДНК-аналізу в Україні в контексті інтеграції до Європейського Союзу. *Вісник Харківського національного університету внутрішніх справ*. 2022. Вип. 97(2). С. 234-249. <https://doi.org/10.32631/v.2022.2.21>; Stepaniuk R., Kikinchuk V., Pyrih I., Pletenets V., Prylovskiy V. Multifaceted approach to legislative regulation for using DNA analysis in criminal proceedings of Ukraine. *Amazonia Investiga*. 2022. Vol. 11(50). P. 130-139. <https://doi.org/10.34069/AI/2022.50.02.13>; Степанюк Р. Л., Гусєва В.О. Організаційні засади ДНК-ідентифікації загиблих унаслідок надзвичайних подій із масовими жертвами. *Криміналістичний вісник*. 2023. № 1 (39). С. 29-38. <https://visnyk.dndekc.mvs.gov.ua/index.php/visnyk/issue/view/61>

² Давидюк П., Пелешок І., Якимчук М. Сучасний стан розвитку молекулярно-генетичної експертизи в Україні. *Науковий вісник Ужгородського національного університету*. Серія: Право. 2023. № 75. Т. 2. С. 171.



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**PRINCIPES ORGANISATIONNELS
D'UTILISATION DE L'ANALYSE
ADN MÉDICALE DANS
LES ENQUÊTES SUR LES
INFRACTIONS CRIMINELLES**

L'article examine les principes organisationnels de l'analyse criminalistique de l'ADN en tant que domaine d'activité pratique dans le domaine de la détection et de l'enquête sur les infractions pénales. L'auteur a défini la liste des principes organisationnels de l'analyse criminalistique de l'ADN, a divulgué leur contenu et déterminé les conditions de mise en œuvre en Ukraine. Il a été établi que ces principes sont : la légalité, c'est-à-dire le strict respect des exigences de la loi à toutes les étapes de la collecte et de la recherche du matériel biologique, de l'utilisation et du stockage des informations génomiques ; une forme exclusivement procédurale d'utilisation de l'analyse ADN dans les procédures pénales ; bon fonctionnement de la comptabilité judiciaire des informations génomiques humaines ; formation de l'analyse de l'ADN en tant que section distincte de la technique criminalistique ; son accompagnement organisationnel et technique, qui implique principalement l'accréditation des laboratoires de génétique criminalistique selon la norme de qualité européenne et le respect des conditions en matière d'équipement technique et d'accompagnement du personnel. Il est établi que la mise en œuvre de ces principes nécessite la nécessité de prendre un certain nombre de mesures réglementaires et organisationnelles au niveau national afin de garantir au moins les conditions minimales pour l'utilisation efficace des technologies d'analyse ADN criminalistique, à savoir : améliorer les normes juridiques au moins en ce qui concerne la réglementation des procédures d'obtention du matériel biologique, la gestion des bases de données ADN et la protection des informations génomiques ; déterminer exclusivement la forme procédurale de l'utilisation de l'analyse ADN dans la procédure pénale, en réglementant, outre l'examen génétique moléculaire, des études

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To Air Transport Security Breaches*

remove biological traces during the inspection of the scene of the incident, appointing molecular genetic examination examinations and evaluate their conclusions³. In addition, the uncertainty of the status of rapid DNA testing was stated⁴, and insufficient capacities of existing molecular genetic examination laboratories⁵. Such problems prevent the proper use of the possibilities of forensic DNA analysis in the practice of Ukrainian law enforcement officers. Therefore, it is considered urgent to define the organizational principles of this direction of practical activity, the observance of which will contribute to the improvement of its general condition in Ukraine.

The first principle, in our opinion, is to ensure the legality of all actions of law enforcement officers and expert institutions related to DNA research, storage and use of biological material and genomic information.

The principle of legality can be implemented provided that proper legal regulation of social relations related to DNA analysis for judicial purposes is established in Ukraine, which does not yet exist, with the exception of the Law of Ukraine "On State Registration of Human Genomic Information" introduced in 2023. But this law alone seems to be insufficient, since the following are also necessary: harmonization of the legislation of Ukraine in the field of forensic expert activity with the norms of the European Union; revision of current legal norms regarding the collection of biological material for conducting examinations; improvement of the mechanisms for the protection of the rights of the subjects of molecular genetic examination; creation of legal mechanisms for the formation of national databases of human DNA; revision of the procedure for using the results, adaptation of national accounting standards and maintenance of human DNA databases to international standards; improvement of the institutional management system, etc⁶.

The introduction of legal norms that will ensure the observance of human rights, first of all, the right to respect for private and family life, when using DNA analysis in criminal proceedings will make it possible to clearly define and continue to observe the principles of the rule of law, humanism, and protection of personal data in this field. In this matter, it is worth supporting researchers who emphasize the need to harmonize domestic and European legislation in the field of forensic DNA analysis and take into account at least minimum European standards⁷.

The next principle, as it seems to us, is the determination of the procedural form of using DNA analysis in criminal proceedings. In our opinion, in connection with the increased social sensitivity of human DNA research issues and the need to protect personal rights in criminal proceedings,

³ Степанюк Р. Л., Іонова В. В. Призначення судової молекулярно-генетичної експертизи на стадії досудового розслідування: проблеми та шляхи їх вирішення. *Вісник Луганського державного університету імені Е.О. Дідоренка*. 3 (91). 2020. С. 307-319; Stepaniuk R., Shcherbakovskiy M., Kikinchuk V., Lapta S., Husieva V. Problems of using forensic molecular-genetic examination in criminal procedure of Ukraine. *Georgian medical news*. 2019/5. № 290. С. 157-163.

⁴ Stepaniuk R. Forensic DNA Analysis: Development State and Prospects in Ukraine. *Theory and Practice of Forensic Science and Criminalistics*. 2021. V. 25(3). P. 70. URL: <https://doi.org/10.32353/khrife.3.2021.05>

⁵ Костенко І. О., Кирпичова К. В. Проблемні питання проведення молекулярно-генетичної експертизи та шляхи їх вирішення. Актуальні питання криміналістики та судової експертизи: матеріали Всеукр. наук.-практ. конф. (Київ, 19 листоп. 2020 р.) / [редкол.: В. В. Черней, С. Д. Гусарев, С. С. Чернявський та ін.]. Київ : Нац. акад. внутр. справ, 2020. С. 219.

⁶ Гамалюк Б. М., Ходирева І. Т. Окремі питання правового регулювання судової молекулярно-генетичної експертизи та обліку генетичних ознак людини. *Вісник Луганського державного університету внутрішніх справ імені Е.О. Дідоренка*. 2022. № 2(98). С. 190. Степанюк Р. Л., Кікінчук В. В. Напрями вдосконалення правового регулювання криміналістичного ДНК-аналізу в Україні в контексті інтеграції до Європейського Союзу. *Вісник Харківського національного університету внутрішніх справ*. 2022. Вип. 97(2). С. 246. URL: <https://doi.org/10.32631/v.2022.2.21>

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preference should be given to the procedural form of using specific expertise in the field of molecular genetics.

Currently, in Ukraine, the relevant technologies are used in two procedural forms, namely: 1) involvement of a forensic specialist and/or a biologist in conducting procedural actions related to the collection of biological traces and samples, primarily inspection of the scene, search and obtaining samples for examination; 2) conducting a forensic molecular genetic examination. At the same time, other methods of using DNA analysis in the detection and investigation of criminal offenses are becoming more and more relevant, the form of which is not defined in Ukrainian legislation, which on the one hand hinders their active implementation, and on the other can lead to a violation of a person's right to respect for private and family life in connection with the processing of her DNA.

This is primarily about rapid DNA testing technologies (Rapid-DNA), which in the current conditions of the active phase of the war are particularly relevant in solving the tasks of identifying the dead, but also in peacetime can be useful for quickly checking individuals for the coincidence of their genetic characteristics with traces from the scene of an unsolved crime or with a DNA database.

Scientists propose to use the approach of Germany and other countries where the procedures for conducting mass rapid DNA tests are enshrined in the Criminal Procedure Code, thus giving them a procedural form⁸. We support such proposals, but it is worth noting that the current difficult conditions of the active phase of the war led to the emergence of new large-scale tasks related to the need for DNA identification of a large number of unidentified victims⁹, and therefore, there is a need to define the rules for rapid DNA identification — profiles of a large number of relatives of the dead and missing persons with the help of Rapid-DNA devices, which have already been provided to Ukrainian law enforcement officers and testify to high efficiency in this direction. In connection with the procedural problems, when the results obtained with the help of such devices are not recognized as appropriate for comparison with the DNA profiles of the remains of the bodies, there is an additional need to give a procedural form to the verification of forensic studies.

Moreover, the need to solve this problem is also dictated by the real prospects of expanding the search capabilities of forensic DNA analysis in the detection and investigation of criminal offenses, which are already being implemented in foreign countries. Such technologies as forensic phenotyping (establishment of a person's biogeographical origin and features of their appearance by DNA), and investigative genetic genealogy (search for relatives in DNA databases) have demonstrated notable results in establishing the identity of unknown criminals. There are no opportunities to use them in Ukraine yet, but in the near future it is quite possible, therefore it is necessary to decide on the appropriate form of using specific expertise, which can also be a verification study.

The next important basis is the functioning of forensic accounting of human genomic information. Forensic records of human genetic features have been functioning in Ukraine for quite some time, but until now it was filled very slowly due to the lack of specific legislation. There is hope that the situation will improve in connection with the introduction of the relevant law, which took place in February 2023, but "legal support for the technical

de vérification ; intensifier la recherche scientifique dans le domaine de la criminalistique en direction de l'analyse de l'ADN et introduire des sujets pertinents dans les programmes éducatifs pour la formation des avocats et des agents chargés de l'application des lois ; coordonner les travaux des différents laboratoires d'analyses d'ADN dans le cadre de leur accréditation, de leur équipement technique avec des équipements compatibles et de la formation du personnel.

L'objectif de l'article est d'analyser les principes organisationnels de l'utilisation de l'analyse ADN criminalistique dans les activités liées à la divulgation et aux enquêtes sur les infractions pénales. Pour atteindre cet objectif, les tâches suivantes ont été fixées : déterminer la liste des principes organisationnels de l'analyse criminalistique de l'ADN, révéler leur contenu et déterminer les conditions de leur mise en œuvre en Ukraine.

Conclusions. L'analyse des dispositions théoriques, des normes juridiques, des besoins modernes, des opportunités et de l'état de l'application pratique des technologies d'analyse ADN criminalistique en Ukraine donne des raisons de souligner plusieurs principes organisationnels de ce domaine de la criminologie et de l'examen criminalistique, dont le respect augmentera l'efficacité de la pratique policière dans ce sens. Ces principes sont : 1) la légalité, c'est-à-dire le strict respect des exigences des actes juridiques réglementaires de toutes les actions des agents chargés de l'application des lois et des institutions expertes liées à la recherche sur l'ADN, au stockage et à l'utilisation du matériel biologique et des informations génomiques ; 2) détermination de la forme exclusivement procédurale de l'usage de l'analyse ADN dans les procédures pénales ; 3) le fonctionnement de la comptabilité judiciaire des informations génomiques humaines ; 4) la formation de l'analyse de l'ADN en tant que section distincte de la technologie médico-légale et son support scientifique et méthodique correspondant ; 5) son support organisationnel et technique.

La mise en œuvre de ces principes en Ukraine nécessite l'adoption d'un certain nombre de mesures réglementaires et organisationnelles pour garantir au moins des conditions minimales pour l'utilisation efficace des technologies d'analyse ADN médico-légale,

⁸ Stepaniuk R., Kikinchuk V., Pyrih I., Pletenets V., Prylovskiy V. Multifaceted approach to legislative regulation for using DNA analysis in criminal proceedings of Ukraine. *Amazonia Investiga*. 2022. Vol. 11(50). P. 136. URL: <https://doi.org/10.34069/AI/2022.50.02.13>

⁹ Степанюк Р. Л., Гусева В.О. Організаційні засади ДНК-ідентифікації загиблих унаслідок надзвичайних подій із масовими жертвами. *Криміналістичний вісник*. 2023. № 1 (39). С. 29-38. URL: <https://visnyk.dndek.mvs.gov.ua/index.php/visnyk/issue/view/61>

à savoir : 1) l'amélioration des normes juridiques concernant l'utilisation de l'analyse ADN dans le cadre d'activités criminelles, procédures, au moins en termes de réglementation des procédures d'obtention de matériel biologique, de gestion des bases de données ADN et de protection des informations génomiques en tant que type de données personnelles ; 2) l'amélioration de la forme d'utilisation des diverses technologies d'analyse de l'ADN dans le processus pénal, en réglementant, outre l'examen génétique moléculaire, des études de vérification ; 3) l'activation de la recherche scientifique dans le domaine de la criminologie en direction de l'analyse de l'ADN et l'introduction de sujets pertinents dans les programmes éducatifs pour la formation des avocats et des forces de l'ordre ; 4) coordination des travaux des différents laboratoires d'analyses d'ADN dans le cadre de leur accréditation, de leur équipement technique avec des équipements compatibles et de la formation du personnel.

Mots-clés : criminalistique, examen criminalistique, procédure pénale, enquête sur les infractions pénales, analyse ADN, technique criminalistique.

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ZASADY ORGANIZACYJNE WYKORZYSTANIA KRYMINALNEJ ANALIZY DNA W ŚLEDZTWIE PRZESTĘPSTW

W artykule zbadano zasady organizacyjne kryminalistycznej analizy DNA jako dziedziny praktycznej działalności w zakresie wykrywania i ścigania przestępstw. Autor zdefiniował listę zasad organizacyjnych kryminalistycznej analizy DNA, ujawnił ich treść oraz określił warunki wdrożenia na Ukrainie. Ustalono, że zasadami tymi są: legalność, czyli ścisłe przestrzeganie wymogów prawa na wszystkich etapach gromadzenia i badania materiału biologicznego, wykorzystywania i przechowywania informacji genomowej; wyłącznie proceduralna forma wykorzystania analizy DNA w postępowaniu karnym; właściwe funkcjonowanie kryminalistycznej księgowości informacji o ludzkim genomie; utworzenie analizy DNA jako odrębnej sekcji technologii kryminalistycznej; jego wsparcie organizacyjno-techniczne, które polega przede wszystkim na akredytacji laboratoriów

protection of the unified information system of the Ministry of Internal Affairs of Ukraine needs improvement (systematization of departmental legislative acts, strengthening of responsibility). Technical protection of information systems of the Ministry of Internal Affairs should be based on a comprehensive approach to the construction of the protection system, which involves combining into a single set of necessary measures and means of information protection at all levels of the information support system¹⁰. Thus, the proper functioning of the forensic DNA database in Ukraine is possible not only under the condition of its legal regulation but also requires technical requirements for the protection of personal data.

In addition, Ukraine's path to EU integration includes, among other things, the fulfillment of requirements to ensure automatic access to genetic databases to other countries under the mechanisms of the Prüm Convention of 2005. Therefore, the relevant organizational and technical issues must also be resolved.

We consider its recognition as a branch of forensic technology and appropriate scientific and methodical support to be the next organizational basis of forensic DNA analysis. This is extremely important in the context of intensifying scientific research and ensuring the appropriate level of knowledge in this field not only among biologists but also among law enforcement officers, lawyers and judges. In order for their actions related to the detection of biological traces, obtaining biological samples, prescribing molecular genetic examinations and evaluating their results to be effective and to minimize the risk of errors, it is necessary to actively spread relevant knowledge among lawyers. Relevant topics should be included in the components of educational programs in the fields of law and law enforcement. Thorough scientific research should be conducted, and relevant textbooks and manuals should be prepared, which is currently lacking in Ukraine.

Criminologists emphasized the insufficient level of scientific development and educational and methodological support of the issues of forensic DNA analysis in Ukraine and the absence of a corresponding section in the system of forensic technology, in connection with which the need for its formation was substantiated and the corresponding theoretical foundations were laid¹¹. It seems to us that maintaining an appropriate level of training of subjects participating in the criminal process, in the context of forming knowledge and skills in handling biological material, obtaining a general idea of expert technologies, understanding the principles of evaluating the results of DNA analysis in judicial proceedings, is an important prerequisite for a successful the functioning of this field of forensic science and forensic examination as a whole. Mistakes at the stage of material collection for molecular genetic examination and during its storage can lead to significant expert errors, and incorrect assessment of the probative value of the expert's conclusions can lead to investigative and judicial errors. The extreme sensitivity of modern means and methods of forensic DNA analysis, which allow establishing a DNA profile from only a few cells, in addition to the positive consequences for the investigation of criminal offenses, requires an extremely serious

¹⁰ Легка О. Правова регламентація реєстрації геномної інформації людини: міжнародний та вітчизняний досвід. Науковий вісник Ужгородського національного університету : Серія Право. 2022. № 72. Т. 2. С. 75.

¹¹ Stepaniuk R. Forensic DNA Analysis: Development State and Prospects in Ukraine. *Theory and Practice of Forensic Science and Criminalistics*. 2021. V. 25(3). P. 60-80. URL: <https://doi.org/10.32353/khrife.3.2021.05>; Степанюк Р. Л., Перлін С. І. Напрями розвитку структури і змісту криміналістичної техніки в Україні. *Криміналістичний вісник*. 2019. Вип. 32 (2). С. 6-14; Криміналістичне дослідження ДНК: технології та можливості : навч. посіб. / М-во внутр. справ України ; Харків. нац. ун-т внутр. справ ; Харків. н.-д. експерт.-криміналіст. [Р. Л. Степанюк, С. І. Перлін, В. В. Кікінчук та ін.]. Вид 2-ге, переробл. та допов. Харків, 2022. 122 с.



approach to the observance of measures to prevent contamination (pollution) of biological material.

Organizational and technical support of forensic DNA analysis also appears to be a strong foundation of this branch of forensic technology.

Currently, in Ukraine, forensic molecular genetic examinations are conducted exclusively in state expert institutions. This is due to the fact that this type of examination is assigned to the class of biological examination as a separate expert specialty of index 9.5 by regulatory and legal acts. In turn, biological examination is included among the forensic ones, and therefore, according to part 3 of Art. 7 of the Law of Ukraine "On Forensic Examination" it cannot be conducted outside of specialized state institutions. This approach of the legislator and the executive authorities can be agreed, given many factors, including the importance of maintaining confidentiality, the destructive methods of expert research, the extremely high cost of error, etc. In specialized state institutions, the appropriate level of technical equipment, quality control, and the level of labor discipline is ensured.

The European standard for the organization of forensic DNA analysis is to involve exclusively expert laboratories that are accredited according to EN ISO/IEC 17025 standard¹², which in Ukraine as a whole is carried out through the appropriate accreditation of domestic molecular genetic research laboratories. However, another organizational condition recognized in forensic genetics is the use of compatible equipment by laboratories to avoid difficulties in comparing the results of DNA analysis. In this regard, it is worth noting that a network of expert molecular genetic research laboratories has been created in Ukraine within the system of the Expert Service of the Ministry of Internal Affairs. Also, relevant laboratories function in some Forensic Medical Examination Bureaus and National Scientific Center «Hon. Prof. M. S. Bokarius Forensic Science Institute». In addition, after the start of the war, the units of technical and forensic support of the pre-trial investigation of the National Police received ANDE rapid DNA testing devices. In such conditions, in our country, ensuring the compatibility of equipment and used research methods is seen as a particularly relevant organizational aspect of forensic DNA analysis. This also applies to personnel support, as not only forensic geneticists are involved in the work, but also police forensic specialists, who must be trained to use the appropriate devices and software and strictly adhere to methodological recommendations to ensure against contamination and other errors.

Conclusions. The analysis of theoretical provisions, legal standards, modern needs, opportunities, and the state of the practical application of forensic DNA analysis technologies in Ukraine gives reasons to single out several organizational principles of this field of criminology and forensic science, compliance with which will increase the effectiveness of law enforcement practice in this area. These principles are: 1) legality, which means strict compliance with the requirements of regulatory legal acts of all actions of law enforcement officers and expert institutions related to DNA research, storage and use of biological material and genomic information; 2) determination of the exclusively procedural form of using DNA analysis in criminal proceedings; 3) functioning of forensic accounting of human genomic information; 4) formation of DNA analysis as a separate section of forensic technology and its corresponding scientific and methodical support; 5) its organizational and technical support.

The implementation of these principles in Ukraine necessitates the adoption of a number of regulatory and organizational measures to ensure

genetyki sądowej zgodnie z europejskim standardem jakości oraz przestrzeganiu warunków dotyczących wyposażenia technicznego i wsparcia kadrowego. Uzasadnia się, że realizacja tych zasad pociąga za sobą konieczność podjęcia szeregu działań regulacyjnych i organizacyjnych na poziomie krajowym w celu zapewnienia przynajmniej minimalnych warunków efektywnego wykorzystania technologii kryminalistycznej analizy DNA, a mianowicie: udoskonalenia norm prawnych przynajmniej w aspekcie uregulowania procedur pozyskiwania materiału biologicznego, zarządzania bazami danych DNA i ochrony informacji genomowej; określić wyłącznie proceduralną formę wykorzystania analizy DNA w procesie karnym, regulując, oprócz badań genetyki molekularnej, badania weryfikacyjne; zintensyfikować badania naukowe w dziedzinie kryminologii w kierunku analizy DNA oraz wprowadzić odpowiednią tematykę do programów edukacyjnych w zakresie szkolenia prawników i funkcjonariuszy organów ścigania; koordynowanie pracy różnych laboratoriów analizy DNA w kontekście ich akredytacji, wyposażenia technicznego w kompatybilny sprzęt i szkolenia personelu.

Celem artykułu jest analiza zasad organizacyjnych wykorzystania kryminalistycznej analizy DNA w działaniach związanych z ujawnianiem i ściganiem przestępstw. Aby rozwiązać ten cel, postawiono następujące zadania: ustalenie wykazu zasad organizacyjnych kryminalistycznej analizy DNA, ujawnienie ich treści oraz określenie warunków ich wdrożenia na Ukrainie.

Wnioski. Analiza przepisów teoretycznych, standardów prawnych, współczesnych potrzeb, możliwości i stanu praktycznego zastosowania technologii kryminalistycznej analizy DNA na Ukrainie daje podstawy do wyodrębnienia kilku zasad organizacyjnych tej dziedziny kryminologii i kryminalistyki, których przestrzeganie zwiększy efektywność praktyki organów ścigania w tym kierunku. wykorzystaniem materiału biologicznego oraz informacji genomowej; 2) określenie wyłącznie

Słowa kluczowe: kryminologia, ogledziny kryminalistyczne, postępowanie karne, dochodzenie w sprawie przestępstwa, analiza DNA, technika kryminalistyczna.

¹² Степанюк Р. Л., Кікінчук В. В. Напрями вдосконалення правового регулювання криміналістичного ДНК-аналізу в Україні в контексті інтеграції до Європейського Союзу. Вісник Харківського національного університету внутрішніх справ. 2022. Вип. 97(2). С. 232. URL: <https://doi.org/10.32631/v.2022.2.21>

**ORGANISATORISCHE
GRUNDSÄTZE FÜR DEN EINSATZ
FORENSISCHER DNA-ANALYSE
BEI STRAFTATSCHRIFTEN**

Der Artikel untersucht die Organisationsprinzipien der forensischen DNA-Analyse als Richtung der praktischen Tätigkeit im Bereich der Aufdeckung und Aufklärung von Straftaten. Der Autor definierte die Liste der Organisationsprinzipien der forensischen DNA-Analyse, legte deren Inhalt offen und legte die Bedingungen für die Umsetzung in der Ukraine fest. Es wurde festgestellt, dass diese Grundsätze folgende sind: Legalität, d. h. strikte Einhaltung der gesetzlichen Anforderungen in allen Phasen der Sammlung und Erforschung biologischen Materials sowie der Nutzung und Speicherung genomischer Informationen; eine ausschließlich prozessuale Form der Nutzung der DNA-Analyse im Strafverfahren; ordnungsgemäßes Funktionieren der forensischen Erfassung menschlicher Genominformationen; Bildung der DNA-Analyse als eigenständiger Bereich der forensischen Technik; seine organisatorische und technische Betreuung, die vor allem die Akkreditierung forensischer Genetiklabore nach europäischem Qualitätsstandard und die Einhaltung der Auflagen zur technischen Ausstattung und personellen Betreuung umfasst. Es wird begründet, dass die Umsetzung dieser Grundsätze die Notwendigkeit erfordert, auf nationaler Ebene eine Reihe regulatorischer und organisatorischer Maßnahmen zu ergreifen, um zumindest die Mindestbedingungen für den effektiven Einsatz forensischer DNA-Analystechnologien sicherzustellen, nämlich: die Verbesserung der Rechtsnormen zumindest im Hinblick auf die Regulierung von Verfahren zur Gewinnung von biologischem Material, zur Verwaltung von DNA-Datenbanken und zum Schutz genomischer Informationen; bestimmen ausschließlich die Verfahrensform des Einsatzes von DNA-Analysen im Strafverfahren und regeln neben der molekulargenetischen Untersuchung auch Überprüfungsstudien; die wissenschaftliche Forschung auf dem Gebiet der Kriminalistik in Richtung DNA-Analyse zu intensivieren und relevante Themen in Bildungsprogramme für

at least minimum conditions for the effective use of forensic DNA analysis technologies, namely: 1) improvement of legal norms regarding the use of DNA analysis in criminal proceedings, at least in the aspect of regulation of procedures for obtaining biological material, management of DNA databases and protection of genomic information as a type of personal data; 2) improvement of the form of use of various technologies of DNA analysis in the criminal process, by regulating, in addition to molecular genetic examination, verification studies; 3) activation of scientific research in the field of criminalistics in the direction of DNA analysis and the introduction of relevant topics into educational programs for the training of lawyers and law enforcement officers; 4) coordination of the work of various DNA analysis laboratories in the context of their accreditation, technical equipment with compatible equipment and personnel training.

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die Ausbildung von Rechtsanwälten und Strafverfolgungsbeamten einzubringen; Koordinierung der Arbeit verschiedener DNA-Analyselabore im Rahmen ihrer Akkreditierung, technischen Ausstattung mit kompatibler Ausrüstung und Personalschulung. Der Zweck des Artikels besteht darin, die organisatorischen Grundsätze des Einsatzes forensischer DNA-Analyse bei Aktivitäten im Zusammenhang mit der Offenlegung und Offenlegung zu analysieren Aufklärung von Straftaten. Um dieses Ziel zu erreichen, wurden folgende Aufgaben gestellt: Festlegung der Liste der Organisationsprinzipien der forensischen DNA-Analyse, Offenlegung ihres Inhalts und Festlegung der Bedingungen für ihre Umsetzung in der Ukraine. Schlussfolgerungen. Die Analyse theoretischer Bestimmungen, rechtlicher Standards, moderner Bedürfnisse, Möglichkeiten und des Stands der praktischen Anwendung forensischer DNA-Analysetechnologien in der Ukraine gibt Anlass, mehrere Organisationsprinzipien dieses Bereichs der Kriminologie und Forensik hervorzuheben, deren Einhaltung die Wirksamkeit erhöhen wird Strafverfolgungspraxis in diese Richtung.

Schlüsselwörter: Kriminologie, forensische Untersuchung, Strafverfahren, Aufklärung von Straftaten, DNA-Analyse, forensische Technik.

