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Журнал внесено до категорії «Б» (наказ від 15.04.21 №420) Переліку наукових фахових видань України, в яких можуть публікуватися результати дисертаційних робіт на здобуття наукових ступенів доктора наук, кандидата наук та ступеня доктора філософії (відповідно до Порядку формування Переліку наукових фахових видань України, затвердженого наказом МОН України від 15 січня 2018 року № 32, зареєстрованого в Мін'юсті України 06 лютого 2018 року за № 148/21600)

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Рекомендовано до друку рішенням вченої ради Національного наукового центру «Інститут судових експертиз ім. Засл. проф. М. С. Бокаріуса» (протокол № 04 від 20 червня 2022 р.)

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Видання «Архів кримінології та судових наук» є відновленням заснованого в 1926 році Заслуженим професором Миколою Сергійовичем Бокаріусом наукового журналу «Архив криминологии и судебной медицину». За задумом М. С. Бокаріуса, видання охоплювало широке коло актуальних питань у сфері кримінології, криміналістики та судової медицини. Авторами матеріалів були видатні вчені України, Німеччини, Франції, Італії, Іспанії, Бельгії, Болгарії, Фінляндії та інших країн світу. Таким чином М. С. Бокаріус установлював зв'язки з ученими різних держав. Журнал розсилався в різні країни світу, де користувався особливою популярністю серед науковців. Микола Сергійович здійснив значний внесок у розвиток вітчизняної науки, зміцнюючи її авторитет за кордоном.

У науковому журналі увазі читачів запропановано цікаві наукові статті, новини наукового життя науково-дослідних судово-експертних установ України та зарубіжжя, інформацію про підготовку наукових кадрів вищої кваліфікації, нове галузеве законодавство тощо. У підготовці наукових статей для наукового журналу взяли участь представники судово-експертних установ, закладів вищої освіти тощо не лише України, а й зарубіжних країн.

Висловлюємо щиру вдячність усім авторам, які надали матеріали для оприлюднення в науковому журналі, а також фахівцям, які долучилися до його видання.
Запрошуємо вчених і практиків до підготовки наукових статей у наступному номері.

Статті пройшли внутрішнє та зовнішнє рецензування.
Редакційна колегія наукового журналу не завжди поділяє думки авторів.
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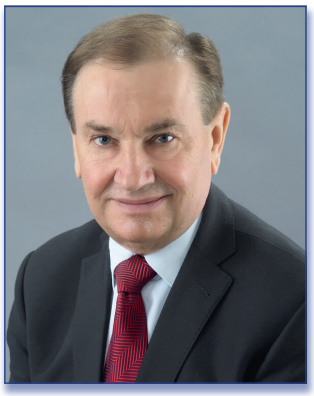

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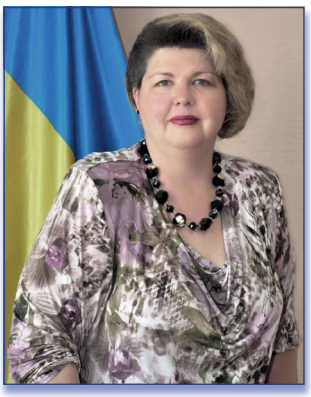

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Particular Aspects Of Collection, Study And Processing Of Genomic Information, Biomaterials Of Persons And Conduct Of Molecular Genetic Examination In Ukraine (Review Article)

Abstract. The article deals with issues of organization and examination of physical evidence of biological origin (molecular genetic examination), which is becoming an increasingly relevant element in criminal proceedings.

The authors stress that study and processing of human genomic information, as well as conduct of molecular genetic examination in forensic science institutions, which have been studied in Ukraine and abroad, can be considered in two interrelated persepctives: relevant issues of appointing and conducting molecular genetic examination in conditions of modern legal reality; moral and ethical aspects of ensuring human rights on the use of genomic information and human biomaterial.

Also, an analysis of the practice of the European Court of Human Rights in the field of using genomic information and human biological material was also carried out. The need for the legislative introduction of international standards in the process of molecular genetic examination has been identified and substantiated.

Keywords: forensic examination, forensic science institutions, protection of human rights, European Court of Human Rights, national and international

legislation, genome, genomic information, human biological material, DNA forensics, DNA identification, molecular genetic examination.

1. Introduction

Forensic examination as a criminal procedural institution has long been firmly embedded in the practice of criminal justice. Developing and improving on the basis of the latest scientific and technical achievements, forensic examinations appear more and more often in criminal proceedings, helping to determine factual circumstances of a case.

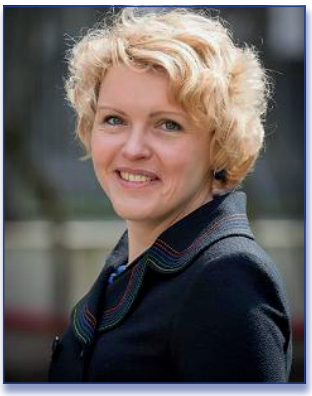
The collection, study and processing of human genomic information as well as conduct of molecular genetic examination in conditions of modern legal reality are of particular relevance. Every year, criminals try to use more sophisticated ways to commit illegal acts and conceal evidence. It should be highlighted that due to changes in the modern world, various areas of illegal activity are also evolving, but thanks to the use of modern technologies, law enforcement agencies, with an active assistance of forensic science institutions, manage to effectively solve crimes. One of these methods is molecular genetic examination.

In the practice of law enforcement agencies of the Ministry of Internal Affairs of Ukraine, the main method of identifying a person is the study of papillary hand patterns. Thus, when committing a crime, persons use gloves, means clogging papillary patterns, as a result of which alternative methods of perpetrator identification are required. Dactyloscopy (fingerprint identification) is being replaced by molecular genetic examination, i.e. DNA research. As stated in Article 1 of the Law of Ukraine: *On the State Registration of Human Genomic Information*, human genomic information is human genetic traits and data about them; molecular genetic examination (research) for state registration of genomic information is research on biological material to obtain genetic traits of a person. All data received by authorized entities will be stored in a database of human genomic information: a collection of organized data on genomic information in electronic form[1].

By using the 1/100% of person-specific DNA, scientists can make specific determinations that have significant forensic value to the prosecution of a case. First, they can determine the genetic profile drawn from bio- logical evidence found at a crime scene and match it to the genetic pro- file from a defendant, which would tie this defendant to this charged crime. Then, a scientist can calculate the statistical probability that a ran- dom unrelated person within the human population would coincidentally have the same genetic profile as the one taken from the crime scene evi- dence. Such a determination helps the prosecutor to meet the burden of proving that this person committed this crime. When performing forensic DNA testing, analysts first compare the pro- file generated from the crime scene evidence sample to the profile gen- erated from the offender's sample. To do this, the analyst examines 13 locations along the chromosome, known as loci, which the relevant international scientific community has identified as suitable for compari- son purposes. Each locus contains two alleles, one from each parent.

When the STRs from a crime scene profile match an offender's profile, it means that there is a match at each and every one of the 26 alleles (genes) that comprise the 13 loci (The 13 core loci used for STR comparisons are: TPOX, D3S1358, FGA, D5S818, CSF1PO, D7S820, D8S1179,TH01,VWA, D13S317, D18S51, D21S11, and D16S539. Profiles are also developed at the Amelogenin locus for sex determination. Currently, Profiler Plus ID and CoFiler typing systems are the kits predominantly used for analysis. MtDNA analysis only looks at a single locus, in comparison to the 13 that are looked

[1] Про державну реєстрацію геномної інформації людини. Закон України. URL: http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?id=&pf3511=70902



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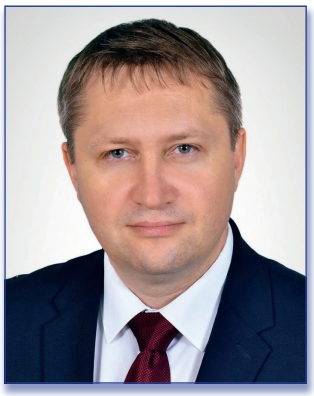

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Declaration of Competing Interest

The author declare that they have no conflict of interest.

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ОКРЕМІ АСПЕКТИ ЗБИРАННЯ, ВИВЧЕННЯ ТА ОБРОБКИ ГЕНОМНОЇ ІНФОРМАЦІЇ, БІОМАТЕРІАЛІВ ОСІБ ТА ПРОВЕДЕННЯ МОЛЕКУЛЯРНО-ГЕНЕТИЧНОЇ ЕКСПЕРТИЗИ В УКРАЇНІ ТА СВІТІ (оглядова стаття)

У статті розглянуті питання організації та проведення експертизи речових доказів біологічного походження (молекулярно-генетичної експертизи), що стають дедалі актуальнішим елементом у кримінальних провадженнях.

Автори наголошують, що вивчення та обробки геномної інформації людини, а також проведенні молекулярно-генетичної експертизи у судово-експертних установах досліджували в Україні та за кордоном можливо розглядати у двох взаємопов'язаних площинах: актуальні проблеми призначення і проведення молекулярно-генетичної експертизи в умовах сучасної правової дійсності; морально-етичні аспекти забезпечення прав людини про використання геномної інформації та біоматеріалу людини.

Також проведено аналіз практики Європейського Суду з прав людини у сфері використання геномної інформації та біологічного матеріалу людини. Виявлено та обгрунтовано необхідність законодавчого запровадження міжнародних стандартів у процес проведення молекулярно-генетичної експертизи.

Ключові слова: судова експертиза, судово-експертні установи, захист прав людини, Європейський Суд з прав людини, національне та міжнародне законодавство, геном, геномна інформація, біологічний матеріал людини, ДНК-криміналістика, ДНК-ідентифікація, молекулярно-генетична експертиза.

at for nuclear DNA analysis.)[2]. The specificity of this forensic identification is one of the most significant powers of DNA. When scientists compare the crime scene evidence profile and the offender's profile, they look for a 100% match of the two profiles at the 13 loci. This comparison is not a statistical determination, but rather a scientific one. DNA analysts, however, do speak in terms of statistical probabilities when describing the rarity or frequency of finding a certain profile among human populations. There are approximately six billion people on the earth. Comparing DNA at 13 loci can generate a random match probability greater than six billion. In other words, the analyst may testify that there is no likelihood that anyone else, other than the offender, will have the same genetic profile as the profile generated from both the crime scene evidence and the offender. By calculating the ran- dom match probability, scientists can conclude from whom the DNA originated, also called source attribution of the DNA. In other words, these statistical formulae allow the analyst to demonstrate, using 13 loci in STR testing, that an individual profile matching the profile generated from the crime evidence will not be found in any other unrelated person on earth[3].

Ukrainian law enforcement structures have been using certain types of genomic research in their practice for a long time. But now, in the context of armed aggression, this issue reaches a new level of development and use. After all, right now molecular and genetic examination allows solving a number of urgent needs for identification of people who: committed a criminal offense; went missing; identification of unrecognizable human corpses, their remains and human body parts (this especially applies to our defenders who died on the battlefield or civilians who were in temporarily occupied territories). Thus, for example, only with the help of collecting and processing human genomic information, as well as carrying out molecular genetic examination, it was possible to identify the Ukrainians who died in Bucha (Kyiv region). Approximately two hundred people have not been identified. Their relatives cannot recognize them, that much their bodies have been mutilated by the Muscovites. That is why DNA testing is the only way out. It is carried out by French forensic experts along with our experts.

In four months of the war, more than 6,000 identification examinations have already been scheduled, of which about 40 percent have already been completed. That is why the creation of a tool for accumulating and systematizing this information, giving it a legal status for use as an evidentiary basis in the process of proving crimes of the Russians against Ukraine[4] is extremely urgent today.

2. Literature Review

Particular issues of collecting, studying, and processing human genomic information, as well as conducting molecular genetic examination in forensic science institutions, were studied in research papers by such domestic and foreign scientists as O. M. Bandurka, Z. Bernachek, R. Kh. Bichurin, T. V. Hanzha N. M. Diachenko, A. Ivanovich, V. V. Kikinchuk, M. P. Klymchuk, O. M. Kliuiev, S. M. Lozova, O. V. Matarykina, H. V. Mudretska, V. V. Nevhad, M. V. Nechyporuk, E. B. Simakova-Yefremian, A. Solash, H. O. Spytsyna, N. Ye. Filipenko, O. V. Tsykova, K. Shpindler, M. H. Shcherbakovskyi, G. Juodkaitė and others[5].

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[2] Lisa R. Kreeger, Danielle M. (2003) Weiss Forensic DNA - Be Not Afraid Fundamentals for the Prosecutor. SPECIAL T OPICS SERIES. November 2003. The American Prosecutors Research. URL: https://www.ojp.gov/ncjrs/virtual-library/abstracts/forensic-dna-fundamentals-prosecutor-be-not-afraid

[3] Там само.

[4] «Про державну реєстрацію геномної інформації людини». Закон України. URL: https://mvs.gov.ua/uk/news/parlament-priinyav-zakon-pro-derzavnu-rejestraciyu-genomnoyi-informaciyi-lyudini

[5] Дяченко Н.М. Основні етапи розвитку молекулярно-генетичної експертизи в Державному науково-дослідному експертно-криміналістичному центрі МВС України.

The problems of improving expert activity, the issue of collecting, studying and processing human genomic information as well as conducting molecular genetic examination in forensic science institutions can be studied from various viewpoints: for example, by analyzing the issue history, researching legal matters from a proper perspective, etc. Each of the indicated research areas is rather interesting and seems to be promising. However, the mentioned areas are very comprehensive and at the same time research a phenomenon only from one aspect, so let's focus on the issues of applying the systemic approach to the indicated issue as a method allowing us to carry out a systemic and structural analysis of the phenomenon being studied, considering it in an integrated manner. The range of scientific developments on this issue is quite wide, but not all problematic issues of forensic examination application have been resolved: some of them have only been identified, and some are still debatable and almost undeveloped. But the main issue of such activity is an almost complete lack of legislative framework. Therefore, in no way detracting from the scientific and practical value of published research papers on the issue under consideration, let's stress that the issue of collecting, studying and processing human genomic information, as well as conducting molecular genetic examination, necessitates comprehensive coverage given provisions of current Ukrainian and foreign legislation, professional theoretical research, problems of practice and implementation of international experience. A separate severe issue is problems of moral and ethical collection and application of such information.

For this reason, the topic that will be studied in this article turns out to be highly relevant for Ukrainian science and law enforcement practice.

3. Main Content Presentation

Law enforcement practice shows that organization and conduct of forensic examination of physical evidence of biological origin (molecular genetic examination) are becoming an increasingly important element in criminal proceedings.

Having analyzed a corresponding professional literature and practice of collecting, studying and processing human genomic information, as well as peculiarities of conducting molecular genetic examination in forensic science institutions of Ukraine and abroad, we believe that this issue can be viewed in two interrelated persepctives:

- current issues of appointing and conducting molecular genetic examination in conditions of modern legal reality;
- moral and ethical aspects of ensuring human rights on the use of genomic information and human biomaterial.

Криміналістичний вісник. 2011. № 1 (15). С.165-169.; Stepaniuk R., Shcherbakovskiy M., Kikinchuk V., Lapta S., Guseva V. (2019) Problems of using forensic molecular-genetic examination in criminal procedure of Ukraine. Georgian medical news. 2019/5. № 290. С. 157–163.; Дідик М.М., Горбатенко І.Ю. ДНК-аналіз у криміналістиці: монографія. Херсон: Мрія, 2003. 124 с.; Філіпенко Н. Є., Спіцина Г. О. (2022) Окремі питання збирання, вивчення та обробки геномної інформації людини. Перспективи розвитку науки, освіти та суспільства в Україні та світі: збірник тез доповідей міжнародної науково-практичної конференції (Полтава, 20 травня 2022 р.). Полтава: ЦФЕНД, 2022. С. 33-35.; Ivanović, A., Merike Rump (2011), Accreditation Process Forensic Center of Montenegro to the Mentorship of the European Union (Projects EMFA-2). 10th Symposium of forensic sciencies. Bratislava. Symposium Journal; Fonnel A. E., Johannessen H., Egel T., Gill P. Contamination during criminal investigation: Detecting police contamination and secondary DNA transfer from evidence bags. Forensic Science International: Genetics. Vol. 23. 2016. P. 121–129. URL:https://doi.org/10.1016/ j.fsigen.2016.04.003; Mykola Nechyporuk, Oleksandr Kliuiev, Aleksandar Ivanović, Nataliia Filipenko (2021) Development Strategy of International Cooperation of Forensic Science Institutions of Ukraine with Foreign Experts in Prevention of Terrorist Attacks on Aerospace Industry and Critical Infrastructure. Integrated Computer Technologies in Mechanical Engineering – 2021. Synergetic Engineering Pp. 825-848. Presents the proceedings of the ICTM´21 Conference held in Kharkov, Ukraine, at November 28–29, 2021. ISBN: 978-3-030-94259-5 (eBook). URL: https://link.springer.com/chapter/10.1007/978-3-030-94259-5_64; Juodkaitė-Granskienė, G. Dar kartą apie teismo eksperto kompetenciją. Baudžiamasis procesas: teisingumo garantas ar kliūtis?: recenzuojamų mokslinių straipsnių rinkinys. Sud. Juodkaitė-Granskienė, G. Vilnius: Vilniaus universitetas, 2014, p. 168-201. ISBN 978-609-459-453-3.

Mykola NECHYPORUK, Oleksandr KLIUIEV, Nataliia FILIPENKO, Gabriele JUODKAITĖ-GRANSKIENĖ, Andrii IASHCHENKO

PARTICULAR ASPECTS OF COLLECTION, STUDY AND PROCESSING OF GENOMIC INFORMATION, BIOMATERIALS OF PERSONS AND CONDUCT OF MOLECULAR GENETIC EXAMINATION IN UKRAINE AND WORLDWIDE (review article)

The article deals with issues of organization and examination of physical evidence of biological origin (molecular genetic examination), which is becoming an increasingly relevant element in criminal proceedings.

The authors stress that study and processing of human genomic information, as well as conduct of molecular genetic examination in forensic science institutions, which have been studied in Ukraine and abroad, can be considered in two interrelated persepctives: relevant issues of appointing and conducting molecular genetic examination in conditions of modern legal reality; moral and ethical aspects of ensuring human rights on the use of genomic information and human biomaterial.

Also, an analysis of the practice of the European Court of Human Rights in the field of using genomic information and human biological material was also carried out. The need for the legislative introduction of international standards in the process of molecular genetic examination has been identified and substantiated.

Keywords: forensic examination, forensic science institutions, protection of human rights, European Court of Human Rights, national and international legislation, genome, genomic information, human biological material, DNA forensics, DNA identification, molecular genetic examination.

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CERTAINS ASPECTS D'U RASSEMBLEMENT , DE L'ÉTUDE ET DU TRAITEMENT DES INFORMATIONS GÉNOMIQUES, DES BIOMATÉRIAUX DES PERSONNES ET DE LA RÉALISATION DE L'EXPERTISE EN GÉNÉTIQUE MOLÉCULAIRE EN UKRAINE ET DANS LE MONDE (оглядова стаття)

L'article traite des questions d'organisation et d'examen des preuves matérielles d'origine biologique (examen génétique moléculaire), qui deviennent un élément de plus en plus pertinent dans les procédures pénales.

Les auteurs font remarquer que l'étude et le traitement de l'information génomique humaine, ainsi que la conduite d'examens génétiques moléculaires dans les institutions judiciaires qui ont été étudiés en Ukraine et à l'étranger, peuvent être considérés dans deux plans interdépendants : les problèmes réels de prescription et de conduite examen génétique moléculaire dans les conditions de la réalité juridique moderne ; aspects moraux et éthiques de la garantie des droits de l'homme sur l'usage d'information génomique et du biomatériel humain.

Une analyse de la pratique de la Cour européenne des droits de l'homme dans le domaine de l'utilisation des informations génomiques et du matériel biologique humain a également été réalisée. La nécessité de l'introduction législative de normes internationales dans le processus d'examen génétique moléculaire a été identifiée et justifiée.

Mots-clés: analyse scientifique, institutions d'expertise judiciaire, protection des droits d'homme, Cour européenne des droits de l'homme, législation nationale et internationale, génome, information génomique, matériel biologique humain, criminalistique ADN , identification ADN, examen génétique moléculaire.

Let us consider them in more detail.

Disclosing **the first direction**, we would like to emphasize that one of the most significant elements of the system of forensic support for collection, study and processing of human genomic information, as well as conduct of molecular genetic examination, are organizational principles of specific expertise application. Competent organization of the process of expert support is one of the basic conditions for efficient pretrial investigation, especially in cases related to human genomic material. In our opinion, legal scholars do not always address this direction properly. Meanwhile, expert activity on the study of human genomic information, as well as conduct of molecular genetic examination, is very difficult and requires qualified use of modern technical means and methods[6].

The issues of organizing this area of expert activity are rather comprehensive. For example, Article 4 of the Law of Ukraine: *On Judicial Examination* states: guarantees regarding independence of the forensic expert and accuracy of his/her conclusion are ensured by: the procedure for appointing a forensic expert specified by law; prohibition to interfere with the process of conducting forensic examination under the threat of legal liability; existence of forensic science institutions, independent of bodies carrying out crime detection and investigation activities, bodies of pre-trial investigation and the court; creation of necessary conditions for the activity of a forensic expert, ensuring his material and social support; criminal liability of a forensic expert for providing a knowingly false conclusion and refusing to perform duties without valid reasons; the possibility of appointing re-examination; the presence of process participants in cases stipulated by law while forensic examination[7] (emphasis added). In practice, forensic experts who conduct research on human genomic samples on behalf of bodies carrying out crime detection and investigation activities, investigation and inquest, can structurally be part of law enforcement agencies (for example, the Ministry of Internal Affairs of Ukraine). On the one hand, it facilitates work of expert departments (for example, the efficiency of expert responsiveness increases). On the other hand, it imposes certain difficulties, since a forensic expert is officially dependent on the head of this law enforcement agency, has a special title, is subject to the requirements of provisions on service in relevant bodies, statutes, etc. An expert, who is an employee of a law enforcement structure, by the very fact of his official position in this body, even unintentionally, may be somehow psychologically impacted. If an expert gives preference to a sense of *corporate solidarity* rather than scientific truth, it may affect the content of expert conclusions. We believe that a valid observance of the principle of expert independence would be allocation of expert services into a separate non-departmental structure, which can be called, for example, an Expert Committee. The issue of technical and forensic support of investigative actions and preliminary investigation on the scene should be addressed by the investigation service, which is in the structure of law enforcement agencies, and research activities (special and expert research) will be carried out by experts of an Expert Committee.

It should also be stressed that in the theory of criminalistics there is an opinion that identification of a person who committed a crime, a victim or an unrecognized corpse is one of the principal tasks of criminalistics[8]. Currently, there are many methods for identifying a person: reconstruction of appearance by the skull, dactyloscopy and others, but we should clarify

[6] Галан Н. В., Чорний М. В. Використання генетичної експертизи у кримінальному провадженні // Кримінологічна теорія і практика: досвід, проблеми сьогодення та шляхи їх вирішення: тези доповіді міжвузівської наук.-практ. конф. (Київ, 23.03.2017). Київ, 2017. URL: http://elar.naiau.kiev.ua/jspui/handle/123456789/4222

[7] Про судову експертизу. Закон України. URL: https://zakon.rada.gov.ua/laws/show/4038-12?find=1&text=незалеж#w1_1

[8] Удовенко Ж. В. Криміналістика: конспект лекцій. За заг. ред. Галана В. І. / Ж. В. Удовенко К.: «Центр учбової літератури», 2016. 320 с.

that the priority is DNA research or molecular genetic examination. The tried-and-tested method of genome research based on existing test systems justifies itself well. But it is not always possible to identify a person, as the database of genomic information is still in the formative stage. As forensic experts note, due to genetics development, the sex of a person, presence of hereditary diseases are accurately specified; the color of the skin, eyes, and hair[9] may be approximately determined.

In academic circles, certain viewpoints have been formed concerning which identification tasks molecular genetic examination can solve. Thus, while investigation of serious crimes, it is advisable to conduct biomaterial research to identify a person in the following cases:

1) determine the belonging of biomaterial to a specific person or exclusion of such belonging;

2) determine gender of biological traces and objects;

3) infanticide (in particular, infants), to establish whether persons involved in a case are the child's parents;

4) determine of whether remains or parts of the corpse are the remains of one person and whose, based on examination of samples of close relatives;

5) identify relationship between different crimes: determining that traces of biological material found at the scenes of different crimes were left by the same person;

6) compare the genetic profile of a biological object with the genetic data stored in the computer database, and if there is a match, guide investigation in searching for a particular person, etc.[10].

As for sampling, it should be performed in compliance with certain requirements. Thus, in practice, the most widespread is selection of buccal epithelium. This method is safe, it is carried out using sterile cotton swabs and brushes[11]. Before collecting biological material, a person must follow certain rules:

1. An hour before collecting, you need to refrain from smoking and consuming food and any drinks.

2. Before collecting samples of the buccal epithelium, rinse the oral cavity several times with clean water without using toothpaste or other oral hygiene products.

3. If the child cannot rinse the oral cavity independently, give him/her some water to drink (if the child does not drink water, the sample is collected from the child no earlier than two hours after breastfeeding or one hour after feeding with infant formulas).

4. To directly collect samples of the buccal epithelium, a person from whom biological samples should be obtained (for a minor, the father or mother) places a brush (or a sterile cotton swab) in the oral cavity and takes at least 10 samples (oral swabs) from the inner surfaces of the right and left cheek (slightly pressing and turning the brush or cotton swab). For each person, the sampling process is repeated twice (using another brush or cotton swab).

5. After completion of the procedure for taking samples of the buccal epithelium, a corresponding act is drawn up (if only an employee of the Expert Service of the Ministry of Internal Affairs takes part in the process,

[9] Демидов С.В., Мінченко Ж.М., Гавриленко Т.І., Топчій Н.М., Новікова С.М. Антропогенетика з основами медичної генетики. Київ. Фітосоціоцентр. 2012.; Особливості збирання у досудовому провадженні біологічних слідів людини: метод. рек. / Фурман Я.В., Юсупов В.В., Котляренко Л.Т., Дмитрук Р.С. К.: Нац. акад. внутр. справ, 2016. 44 с.

[10] Лозова С. М., Лозовий А. О. (2016) Проблемні питання підготовки і проведення молекулярно-генетичних експертиз//Актуальні проблеми правоохоронної діяльності: тези доп. Всеукр. наук.-практ. інтернет-конф. (Сєвєродонецьк, 23.12.2016). Сєвєродонецьк. С. 201.

[11] Канава О. Ю. Проблемні питання проведення молекулярно-генетичних досліджень при ідентифікації безвісти зниклих осіб//Юридичний науковий електронний журнал. Запоріжжя, 2019. № 5. С. 299.

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BESTIMMTE ASPEKTE DER SAMMLUNG, UNTERSUCHUNG UND VERARBEITUNG VON GENOMISCHEN INFORMATIONEN, BIOMATERIALIEN VON PERSONEN UND DURCHFÜHRUNG VON MOLEKULARGENETISCHEM EXPERTISE IN DER UKRAINE UND WELTWEIT (Übersichtsartikel)

Abstrakt. Der Artikel befasst sich mit Fragen der Organisation und Prüfung körperlicher Beweise biologischer Herkunft (molekulargenetische Untersuchung), die ein immer relevanteres Element in Strafverfahren werden.

Die Autoren betonen, dass das Studium und die Verarbeitung menschlicher Genominformationen sowie die Durchführung molekulargenetischer Untersuchungen in forensischen Institutionen, die in der Ukraine und im Ausland untersucht wurden, auf zwei miteinander verbundenen Ebenen betrachtet werden können: den eigentlichen Problemen der Verschreibung und Durchführung molekulargenetische Untersuchung unter den Bedingungen der modernen Rechtswirklichkeit; moralische und ethische Aspekte der Gewährleistung der Menschenrechte bei der Nutzung von Genominformationen und menschlichem Biomaterial.

Außerdem wurde eine Analyse der Praxis des Europäischen Gerichtshofs für Menschenrechte im Bereich der Nutzung von genomischen Informationen und menschlichem biologischem Material durchgeführt. Die Notwendigkeit der gesetzlichen Einführung internationaler Standards in den Prozess der molekulargenetischen Untersuchung wurde identifiziert und begründet.

Schlüsselwörter: forensische Untersuchung, forensische Sachverständigeninstitutionen, Menschenrechtsschutz, Europäischer Gerichtshof für Menschenrechte, nationale und internationale Gesetzgebung, Genom, Genominformation, menschliches biologisches Material, DNA-Forensik, DNA-Identifizierung, molekulargenetische Untersuchung.

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NIEKTÓRE ASPEKTY WSPÓŁPRACY MIĘDZYNARODOWEJ INSTYTUCJI KRYMINALNYCH UKRAINY Z ZAGRANICZNYMI SPECJALISTAMI W ZAKRESIE GROMADZENIA, BADANIA I PRZETWARZANIA INFORMACJI O GENOMIE CZŁOWIEKA ORAZ PRZEPROWADZANIA EKSPERTÓW MOLEKULARNO-GENETYCZNYCH

(artykuł przeglądowy)

Adnotacja. Rozważono pytanie kwestię wykorzystania nowoczesnych doświadczeń zagranicznych w gromadzeniu, badaniu i przetwarzaniu informacji o genomie człowieka, a także prowadzeniu badań genetyki molekularnej w zakładach medycyny sądowej Ukrainy. Analizowana jest specyfika realizacji głównych form organizacyjnych takiej współpracy – poprzez specjalne (eksperckie) instytucje i określonych specjalistów – biegłych sądowych. Dokonano analizy międzynarodowych standardów stosowanych w działalności ekspertów medycyny sądowej. Dokonano analizy praktyki Europejskiego Trybunału Praw Człowieka w zakresie wykorzystania informacji genomicznej i ludzkiego materiału biologicznego. Zidentyfikowano i uzasadniono potrzebę legislacyjnego wprowadzenia międzynarodowych standardów w procesie badań genetyki molekularnej.

Słowa kluczowe: ekspertyza kryminalistyczna, biegły, standardy międzynarodowe, instytucje kryminalistyczne, interakcja, informacja genomowa, materiał biologiczny człowieka, kryminalistyka DNA, identyfikacja DNA, bazy DNA, rodzinna analiza DNA, genealogiczne bazy DNA, badania molekularno-genetyczne.

except for a person who provided a sample) or a sample selection protocol drawn up by the investigator[12].

Correct sample selection, proper storage and transportation are conditions for maximum delay of DNA degradation, that is changes in DNA. Degradation of DNA in samples and biological traces of research occurs due to the influence of external factors or intracellular mechanisms, namely: hydrolytic decomposition, chemical oxidation and enzymatic degradation. The mentioned processes result in segmentation of DNA into smaller fragments[13].

It should be emphasized that the main external factors affecting DNA degradation include: temperature, light rays, high humidity. These factors contribute to the emergence and rapid reproduction of bacteria, as well as further decay of biological traces. At the same time, we must take into account that in any case natural processes after the death of a person lead to DNA degradation[14].

Therefore, identified and selected biological samples, as well as physical evidence, should be dried, packed in paper packaging and stored in a cool and sunlight-free place with low humidity. If samples are frozen, repeated thawing should be avoided. In order to preserve DNA, the investigator must ensure their correct selection and packaging, creation and maintenance of appropriate storage conditions and, in certain cases, appointment of the aforementioned examination as soon as possible.

Awareness of the indicated identification tasks, which molecular genetic examination helps to solve, will to some extent ensure the correctness of the actions of investigators at the initial stage of investigation. An important condition for successful solution of expert tasks is to correctly select the sequence of appointment of various types of forensic examinations. In particular, it must not be forgotten that, on the one hand, the methods of molecular genetic research are destructive, so after its completion, it is impossible to determine, for example, the papillary pattern in handprints. On the other hand, seizure of handprints and conduct of dactyloscopic examination for further molecular genetic examination require the use of technical means and methods ensuring DNA preservation. In addition, in each case of appointment of forensic molecular genetic examination, a forensic expert must be granted permission to destroy the research object. Otherwise, the examination is impossible[15].

Quite common mistakes that occur while investigative practice during the appointment of forensic examinations are mistakes concerning research objects, the number of forensic examinations, and also sequence of their appointment. The first is appointment of one molecular genetic examination for considerable number of objects, which increases the timing of forensic examination, and therefore the timing for solving urgent issues for investigation, significantly increases the cost of consumables and the

[12] Методичні рекомендації з організації проведення відбору зразків біологічного походження в близьких осіб зниклих безвісти та призначення молекулярно-генетичної експертизи, проведення заходів з розшуку зазначених громадян та реагування за фактами зникнення безвісти людей у районах проведення антитерористичних операцій/МВС України, Державний НДЕКЦ; Нацполіція України, Головне слідче управління, Департамент карного розшуку. Київ, 2016. С. 8-10.

[13] Dr. Surat P., Ph. D. Reviewed by Dr. Damien Jonas Wilson, MD, Medical Life Science (2018). URL: https://www.news-medical.net/medical/authors/damien-jonas-wilson?page=24

[14] McCord B., Opel K., Funes M., Zoppis S., Jantz L. M. An Investigation of the Effect of DNA Degradation and Inhibition on PCR Amplification of Single Source and Mixed Forensic Samples. 2011. URL: https://www.ncjrs.gov/pdffiles1/nij/grants/236692.pdf

[15] Степанюк Р. Л. Особливості призначення судової молекулярно-генетичної експертизи під час розслідування вбивств//Науковий вісник Дніпропетровського державного університету внутрішніх справ. Дніпро, 2019. № 3. С. 174-178.

probability of an expert error due to excessive length and laboriousness of research process[16].

The second issue is an unjustified appointment of many molecular genetic examinations based on a significant amount of physical evidence, although there is a small[17] probability to find a DNA relevant to a case on it.

The problem of defining questions that the forensic expert will address requires special attention. Analysis of professional sources and law enforcement and judicial practice also shows cases of formulation of questions regarding determination of genetic traits of objects, without asking about the existence or lack of overlap in these traits[18].

Agreeing with researchers[19], we would like to emphasize that in order to avoid the mentioned mistakes, it is vital to involve in criminal proceedings specialists who are knowledgeable in the field of molecular genetics. The latter, having studied materials of criminal proceedings, can provide clear guidelines on the required number of examinations, objects that should be received for research, and help to formulate clear questions that a forensic expert should address and resolve.

Specific questions will help forensic experts provide clear and unambiguous answers. Therefore, such conclusions will meet the necessary requirements: clarity, unambiguity, validity, understanding of which will not require specific expertise[20].

The need for a preliminary involvement of a specialist is also justified by the fact that, after receiving his advice, the investigator will be able to predict what additional materials a forensic expert will need to conduct research, which will exclude the possibility of filing a petition by the latter, consideration and responses to which will extend the timing of forensic examination, and also, perhaps, will eliminate the need for additional examinations on the same object.

Another daunting issue that constantly arises while application of molecular genetic examination can be considered opposition from the suspect or the accused when submitting biological material for comparative research. The Law of Ukraine: On State Registration of Human Genomic Information stipulates the circle of persons who are obliged to provide biological material for mandatory state genomic registration in a single database of genomic information. The following genomic information is subject to mandatory state registration:

1) persons brought to criminal liability for committing intentional crimes against life, health, sexual freedom, sexual integrity of a person, in respect of whom a measure of restraint has been chosen;

2) persons who have committed socially dangerous acts against life, health, sexual freedom, sexual integrity of a person, in respect of whom compulsory measures of medical nature have been applied by a court decision;

3) persons convicted of intentional crimes against life, health, sexual freedom, sexual integrity of a person;

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[16] Вуйма А. Г. Особливості підготовки до призначення молекулярно-генетичних експертиз у кримінальних провадженнях, розпочатих у зв'язку зі вчиненням убивств//Теорія та практика судової експертизи і криміналістики: зб. наук. пр./ редкол.: О. М. Клюєв, В. Ю. Шепітько та ін. Харків: Право, 2020. Вип. 21. С. 79-91. DOI: https://doi.org/10.32353/khrife.1.2020_05.

[17] Степанюк Р. Л. Особливості призначення судової молекулярно-генетичної експертизи під час розслідування вбивств//Науковий вісник Дніпропетровського державного університету внутрішніх справ. Дніпро, 2019. № 3. С. 174-178.

[18] Там само. С. 177.

[19] Дідик М. М. ДНК-аналіз як метод криміналістики у різних країнах світу // Вісник Національного університету внутрішніх справ. 2003.Вип. 22. С. 34-36.

[20] Степанюк Р. Л., Щербаковский М. Г., Кикинчук В. В., Лапта С. П., Гусева В. А. Проблему применения судебной молекулярно-генетической экспертизу в уголовном производстве Украину // Georgian medical news. Тбилиси - Нью-Йорк, 2019. № 5 (290). С. 160.

4) found in biological material seized during investigative actions from crime scenes committed under conditions of non-obviousness, or obtained while pre-trial investigation, and unidentified;

5) unidentified corpses of people and their remains, information about the discovery of which has entered into the Unified Register of Pre-trial Investigations and investigation has begun;

6) information about missing persons that according to the court decision can be determined by conducting a molecular genetic examination (research) of previously selected biological samples or biological material taken from personal belongings of a missing person[21].

It should be stressed that existing difficulties at the stage of molecular genetic examination are primarily related to active opposition from the suspect in commission of a criminal offense, which is determined by refusal to submit biological material for research. This opposition on the part of the suspect or the accused is expressed in the form of a written refusal to submit biological material for research. In this refusal, the suspect or the accused (his attorney, representative) refers to the fact that as a result of taking biological material, he may be infected. However, it should be emphasized that in the majority of cases this "fear" is an imaginary reason, respectively indicated in the interests of the suspect or the accused. Seizure of samples for comparative research is performed on a voluntary basis, with the written consent of a person, since collection of biological material is carried out with the help of physical medical intervention (blood sampling from a peripheral vein, finger or histological samples, etc.). Thus, seizure of biological material for molecular genetic examination against a person's will can be considered as a violation of constitutional rights and freedoms, as well as correlation of the specified action with the use of physical force against the latter. It is believed that this power pressure is expressed in the physical restraint of his actions impeding biosamples collection. Therefore, this circumstance is taken into account by attorneys when defending the suspect or the accused, as well as by employees of laboratories or law enforcement agencies implementing the procedure of proving guilt of these persons (specialists of forensic science institutions of the Ministry of Justice of Ukraine, forensic medical institutions and establishments of the Ministry of Health of Ukraine; expert services of the Ministry of Internal Affairs of Ukraine, the Ministry of Defense of Ukraine, the Security Service of Ukraine and the State Border Guard Service of Ukraine; National Police of Ukraine may be involved in selection of biological material)[22]. The norm regulaing the procedure for seizing samples for comparative research is defined by the legislator in Section 3 of Article 245 of the Criminal Procedural Code of Ukraine, where it is stated that collection of biological samples from a person is carried out according to the rules enshrined in Article 241 of the Criminal Procedural Code, which, in turn, states that actions that degrade honor and dignity of a person or are dangerous for their health are not allowed while examination. (clause 4)[23]. However, Article 245 underlines that in a case when a person refuses to voluntarily provide biological samples, investigating judge, court upon motion of a party to criminal proceedings, considered in accordance with the procedure established in Articles 160 –166 of the present Code, shall have the right to give permission to investigator, public prosecutor (or to oblige them if the motion was filed by defense) to take biological samples in a compulsory manner[24] (emphasis added). Therefore, the legal framework

[21] Про державну реєстрацію геномної інформації людини. Закон України. URL: http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?id=&pf3511=70902

[22] Там само.

[23] Кримінальний процесуальний кодекс України. Відомості Верховної Ради України (ВВР), 2013, № 9-10, № 11-12, № 13, ст.88 URL: https://zakon.rada.gov.ua/laws/show/4651-17?find=1&text=зразк#n2250

[24] Там само.

of Ukrainian legislation has a broad interpretation. In this regard, for accurate and effective work of law enforcement officers and forensic experts in such situations, it is needed to amend methodological guidelines or create new ones that would regulate the appropriate interpretation of actions when appointing and conducting molecular genetic examination to identify an individual with traces at the crime scene. The implementation of the above changes will make it possible to use this norm as efficiently as possible, as a result of which the inevitability of punishment for committing a criminal offense will be strengthened in minds of individuals, which, in turn, will reduce the public danger of committed illegal acts.

We would also like to note that insufficient research on this issue, its level of development, as well as the state of personnel training system do not allow timely identification and objective evaluation of a number of factors that negatively affected the main indicators of both law enforcement agencies and expert work of molecular genetic units in state forensic science institutions.

Current research activity of a forensic expert is characterized by a complex nature, use of specialists of various specialties. For example, when studying biological material, it is often interesting to solve the issue of its packaging, which is a task of trace evidence analysis that lies beyond the competence of a medical examiner. In addition, the information support of expert units is rather voluminous arrays of data, and it is impractical to distract specialists from research for such work. In this connection, the issue arises about coordination of actions of specialists, integration of received different knowledge, therefore, we believe that introduction of expert integrators (coordinators) into the staff of expert forensic units is a highly urgent task.

In our opinion, insufficient attention is drawn to general theoretical support of research activity in scientific research. Very often, in pursuit of empiricism, criminalistics often follows practice, although... it should be ahead of practice in terms of development rates, and supply it with new ideas[25]. Indeed, it is vital to pay more attention to fundamental research in criminalistics and forensic science, in particular, on issues of integration of knowledge from various sciences. In this regard, the development of areas related to the application of the theories of information, algorithmization, automation, modeling and probability in criminalistics and forensic science seems interesting. We consider further development of legal issues related to application of specific expertise to be an important direction of scientific activity. For example, work in the field of evaluation of expert conclusion and effective use of research results is of interest.

Intellectual and qualification resources of forensic expert units are not only an internal task of these structures, but also a task of state significance, since it is those people who have a tendency to research possess scientific potential, forming intellectual resources of the country in general.

Undoubtedly, research activity has its own peculiarities and further study of the expert's personality is a relevant direction. Regarding the organizational aspect of this issue, we note that, as practice shows, not every person is able to work in expert units related to collection, study and processing of human genomic information as well as conduct of molecular genetic examination. Some individuals have no inclination to research and analytical work in the bud, others have problems with literacy and writing style (which is important when drawing up an expert conclusion), others find it difficult to withstand monotonous nature of work (the types of everyday activities of an expert are often very similar), fourth, having mastered basic work skills and having received one or two admissions on the right to independently conduct forensic examinations, lose interest in further professional growth. The way out of this situation seems to be implementation of the following provisions:

[25] Теслюк І. О. Тактичні засади застосування криміналістичного прогнозування у досудовому розслідуванні (на прикладі органів Національної поліції України) : монографія. Одеса : Одеський державний університет внутрішніх справ, 2017. 217 с.

1) to conduct a thorough psychological testing on a person's propensity for research, admission to expert units, conduct research on human genomic samples;

2) to check the candidate's literacy and written language style upon admission to the expert units;

3) to organize ongoing courses of additional training for specialists, including abroad, seminars and conferences on exchange of experience, in this connection to make wider use of possibilities of computer networks;

4) no less than once in 3–4 years, to rotate personnel in related areas of expert work, if experts are granted with corresponding access.

The second direction concerns the moral and ethical aspects of ensuring human rights on the use of genomic information and human biomaterial.

The shift in EU policy towards a common forensic science has not only (has become) a decisive step in the development of forensic science, but has also highlighted the previously unidentified need for forensic harmonization and its role in ensuring human security. It is now recognized that only the harmonization of forensic science and law in general can guarantee the existence of the fundamental values of a democratic society: freedom and security[26]. And this is a very important postulate, especially when it comes to a person's protection while collection, study and processing of human genomic information, as well as conduct of molecular genetic examination.

Innovations in the field of organ and tissue transplantation, achievements in genetic engineering, give rise to controversies in the field of balancing the interests of various participants in these procedures, legal and ethical norms (in connection with the emergence of these issues, a new field of science — bioethics — has appeared).

Mandatory and universally recognized ethical beginning of the implementation of any operations to obtain and use genomic information, which was legally enshrined in international legal acts, as well as in national legislation (including Ukrainian), is coordination of their implementation with the interested person (persons). In particular, The International Declaration on Human Genetic Data[27] (hereinafter – The Declaration), endorsed by the Resolution of UNESCO's General Conference on October 16, 2003, proceeds from the fact that collection, processing, use and storage of genetic data (both by public and private structures) consciously presuppose the giving of prior, free, informed and clearly expressed consent (e.g., Articles 2, 9, 14, 21, etc.).

A derivative (in terms of the dynamics of the development of respective relations), but by no means unprincipled component of the studied institution of consent, is the mechanism of withdrawal of previously granted consent. This tool (in its broad interpretation) focuses on not only the actual expression of the "refusal" act, but also the implementation by the "information" provider of a set of measures designed to cancel unauthorized access, circulation and use of genomic information.

The aforementioned became quite widely manifested in standardization of state genomic registration (hereinafter – SGR), and more precisely: such a type of it as voluntary (because under compulsory SGR, the effect of the principle of consent is largely reduced to naught). Let's emphasize that voluntary SGR (in contrast to the compulsory one) necessarily possess an initiative nature. Citizens of Ukraine, as well as foreigners and stateless persons, have the right to voluntary state registration of genomic information. Voluntary state registration of genomic information is carried out on the basis of a written application of a person about selection of biological material from them, conduct of molecular genetic examination and the entry of genomic

[26] Europos Kriminalistikos Bendros Erdvės, 2020. Vizijos Įgyvendinimo Lietuvoje Mokslinė Koncepcija. Mokslo studija. Vilnius: Mykolo Romerio universi- tetas. 2016, 372 p. P. 354.

[27] Міжнародна декларація про генетичні дані людини. URL: https://www.un.org/ru/documents/decl_conv/declarations/genome_dec.shtml

information into the Database. Voluntary state registration of genomic information of minors is carried out on the basis of a written statement of their legal representatives. Obtaining biological material from minors is performed in the presence of their legal representatives. Voluntary state registration of genomic information of Ukrainian citizens recognized as incapacitated or legally incapacitated in accordance with the procedure stipulated by legislation is carried out on the basis of a written statement of their legal representatives. Obtaining biological material from persons recognized as incapacitated and whose civil capacity is limited in accordance with the procedure enshrined by legislation is carried out in the presence of their legal representatives. Voluntary state registration of genomic information of certain categories of people (for example, minors) is carried out on a fee basis (Article 6 of the Law of Ukraine: On State Registration of Human Genomic Information)[28].

In fact, it is justified to talk about the emergence of a contractual relationship of a special kind (with a strong predominance of the public element) in relation to the processing of personal genomic information. The aspect of position revision is addressed by the legislator within the framework of the regulation of issues associated with the destruction of genomic information (e.g., Article 13 of the Law). Biological material selected for state registration of genomic information is destroyed in the event that the Database Administrator receives a court decision to stop the imposition of coercive measures of a medical nature to persons; in the event that the Database Administrator receives information that such persons serve a sentence in 8 years after selection, but not later than in 10 years. Biological material selected for state registration of genomic information is destroyed in accordance with the procedure enshrined by the criminal procedural legislation of Ukraine; after expiration of storage period which is determined by the manufacturer of means (systems) for selection of biological samples[29].

Unfortunately, a significant disadvantage of this legislative act is the lack of a provision within its regulations on a written statement of a relevant person submitted at any time before the expiration of specified "set" storage periods.

The lack of this provision significantly limits the rights of individuals and contradicts international legal acts, for example, The International Declaration on Human Genetic Data. The provisions of Article 21 of the Declaration emphasize that it is appropriate to provide a person's genetic data for forensic medical purposes or for the purposes of civil proceedings only for the period for which it is necessary and for specified purposes (regarding the institution of voluntary HGR, it means an unconditional necessity to destroy genomic information at the request of an interested person). In addition, we would like to emphasize that a person submitting an application for destruction of genomic information, first of all, should not specify in it any motives and grounds for their decision, that is, reasons for withdrawing consent are legally irrelevant. Secondly, submitting an application as a legitimate way to terminate relevant legal ties should not result in any negative consequences (this nuance, by the way, was explicitly specified in Article 9 of the Declaration)[30].

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[28] Про державну реєстрацію геномної інформації людини. Закон України. URL: http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?id=&pf3511=70902

[29] Там само.

[30] Стаття 9: Відкликання згоди: a) У тих випадках, коли генетичні дані людини, протеомічні дані людини або біологічні зразки збираються з медичною та науковою метою, відповідна особа може відкликати свою згоду, якщо тільки такі дані не є незворотньо відокремленими від особи, яка може бути ідентифікована. Відповідно до положень статті 6.d) відкликання згоди не повинно спричиняти для відповідної особи будь-які несприятливі наслідки або санкції. b) Коли особа відкликає згоду, генетичні дані, протеомічні дані та біологічні зразки цієї особи не повинні далі використовуватися, якщо тільки вони невідворотно відокремлені від відповідної особи. c) З даними та біологічними зразками, якщо вони незворотньо не відокремлені, слід звертатися відповідно до побажань такої особи. Якщо побажання особи

If Ukraine does not focus on this legal nuance, then, most likely, it will be held accountable in he European Court of Human Rights (hereinafter referred to as the ECHR).

And if we are talking about consideration of cases at the ECHR, we would like to note that not always the judicial system of a particular state copes with solution of such tasks, and in this case, citizens turn to the European Court of Human Rights to protect their rights. In recent years, the ECHR has accumulated a sufficient number of cases related to the collection, storage and use of human genetic material.

In this regard, it is quite useful to study individual decisions, both for the formation of standpoints in specific cases and for the analysis of the experience of consideration of this category of disputes in order to improve the content of national legislation and the activities of national judicial bodies.

Analyzing the decisions of the ECHR as to the category of disputes under consideration, it is appropriate to divide them into several groups related to the determination of issues associated with collection, use and storage of human biomaterials.

1. *Collection of biological materials.*

When taking into account issues connected with collection of human genetic material, the ECHR puts emphasis on the legality of such a procedure in accordance with current national legislation, as well as completeness of the content of legal regulations governing this procedure. First of all, attention is drawn to the manifestation of the will of the citizen, given by them during his life, in the form of consent or non-consent to the removal of organs and body tissues after their death, as well as consent or non-consent of a survived husband (wife) or other relatives to implement such manipulations with the body of their deceased loved one. In the case of Elberte v. Latvia, in The ECHR Resolution No. 61243/08 dated January 13, 2015, removal of organs and tissues from the body of a deceased person[31] was considered. According to the case file, on May 19, 2011, the applicant's husband was involved in a car accident and died on the way to the hospital. On May 20, 2011, his body was taken to the Forensic Medical Center in Riga where an autopsy was performed and the cause of the man's death was determined. On May 26, 2011, the man's funeral took place, where his wife (the applicant of complaint) saw that the deceased man's legs were tied, and he was buried in this way. Later, it was established that some organs and tissues were removed from the deceased's body while autopsy, which were further transferred by the Forensic Expertise Center of Latvia to the medical company in Germany for manufacture of bio-implants. At a later time, these bio-implants were to be transferred back to Latvia for transplantation to people in need. The applicant found out about it two years later as part of the investigation into a criminal case on illicit removal of body tissues and organs from her late husband. The main arguments of the applicant were reduced to the fact that while such removal, she, as a wife, did not provide consent to remove organs and tissues from the body of her late husband, and also was not informed about such removal. The Government of the Republic of Latvia stated that the Latvian law in force at that time allowed selection of organs and tissues of deceased persons in the event that the deceased did not express his refusal to become an organ and tissue donor during his lifetime and if no objections were received from closest relatives. At the same time, the law does not oblige to obtain consent of the closest relatives in such cases. In addition, the removal of organs in this case was carried out for a social purpose: saving lives of other people. While consideration of the case, the ECHR

не можуть бути визначені, нездійсненні чи ненадійні, то дані та біологічні зразки мають бути незворотньо відокремлені чи знищені.

[31] Case of Elberte v. Latvia (Application no. 61243/08), 13/01/2015, ECHR 2015. URL: http://hudoc.echr.coe.int/eng?i=001-150234

established that the employees of the Forensic Expertise Center of Latvia did not even make an attempt to check the existence of a person's consent or refusal to remove organs and tissues from the body after his death, since a corresponding stamp is put in the citizen's passport, and it was at home at the time of autopsy. The analysis of the national legislation of Latvia also showed that there is a relevant law that stipulates the right of a relative to express his will regarding the removal of organs and tissues from the body of a deceased person. However, this law does not prescribe rules obliging relevant state bodies to seek such consent or refusal, as well as any forms of documents that would reflect the very fact of appeal based on the expression of the will of the deceased's relatives and its result.

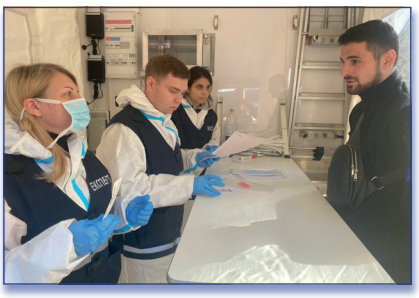
When making the decision, the ECHR referred to the provisions of the Resolution of the Committee of Ministers of the Council of Europe (78) 29: On the unification of legislation of participating states on the issue of removal and transplantation of human biomaterials of May 11, 1978, the national legislation of Latvia. Having considered the case, the court ruled that there was a violation of the applicant's right to respect for her personal and family life, enshrined in Article 8 of European Convention on Human Rights dated November 4, 1950[32].

This case was analyzed in sufficient detail to explain the progress of consideration of this category of cases at the ECHR, discovered and analyzed facts and circumstances of the case, applicable acts, justification of the position of applicants and governments of states against whom the complaint was made (e.g., Annex).

2. Collection of genomic information from persons recognized as guilty of committing offenses by national legislation.

In these cases, as a rule, actions of state authorities regarding storage of DNA materials of a person are contested, when it has been established that the applicant is guilty of a crime, motivating that there is a discrepancy between the committed act and negative consequences that may arise or follow from the storage of genomic information of applicants in databases of respective states. Among such cases, the cases of S. and Marper v. the United Kingdom are very illustrative: Resolutions of the Grand Chamber of the ECHR No. 30562/04, 30566/044[33] dated December 4, 2008. These were two cases that were considered by the Grand Chamber of the European Court at the same time.

In the case of S., criminal prosecution was terminated with a further acquittal. He was not guilty in the Marper case. However, in both the first and second cases, the applicants as suspects were subjected to a coercive procedure in which DNA samples and fingerprints were taken from them. Later, this information was not deleted by police officers from databases. When researching national English legislation, it was determined that genetic information of criminal suspects can be stored in a database for unlimited time. The Grand Chamber of the European Court stressed that "taking into account the nature and amount of personal information contained in the cellular samples, including unique genetic codes that highly relate to both applicants and their relatives, as well as the ability of DNA profiles to ensure identification of genetic relationships between people or draw up conclusions on their ethnic origin, the storage of cell samples and DNA profiles in itself constituted an interference with the applicants'



[32] Конвенция о защите прав человека и основных свобод (Заключена в г. Риме 04.11.1950) (с изм. от 13.05.2004) (вместе с «Протоколом [№1]» (Подписан в г. Париже 20.03.1952), «Протоколом № 4 об обеспечении некоторых прав и свобод помимо тех, которые уже включены в Конвенцию и первуй Протокол к ней» (Подписан в г. Страсбурге 16.09.1963), «Протоколом № 7» (Подписан в г. Страсбурге 22.11.1984)) // Бюллетень международных договоров. 2001. № 3.

[33] Case S. and Marper v. the United Kingdom (Application no. 30562/04, 30566/044), 04/12/2008, ECHR 2008. URL: https://hudoc.echr.coe.int/eng#{«fulltext»:[«30562/04»],»itemid»:[«001-90051»]}

right to respect for their private life". Although the storage of fingerprints had less impact on private life than the storage of cell samples and DNA profiles, a unique information they contain about individuals concerned and its storage without the consent of the latter cannot be viewed as neutral or insignificant and is also an interference with the right to respect for private life. It was also established that the national legislation of England in the studied aspect does not distinguish between persons whose guilt has not been proven in crime commission and convicted persons. It is necessary to clearly define purposes of genomic information collection and time limit for its storage. An important conclusion was drawn that "the nature of the right to store applied in the applicants' case disrupted the fair balance of competing public and private interests, and in this respect, the respondent State has gone beyond the acceptable margin of appreciation. Accordingly, storage of personal data was an inappropriate interference with the applicants' right to respect for private life and could not be considered important in a democratic society"[34].

In this review article, we have provided only some examples of consideration of cases at the ECHR. But this is a separate, very big issue. And it certainly needs a separate in-depth study.

4. Conclusions

Summarizing the above, we note that for the development and further effectiveness of measures for collection, study and processing of genomic information and other human biomaterial, as well as conduct of molecular genetic examination, the following must be implemented:

1. Systematic changes in the current legislation are required, even in what was adopted recently (we are talking about the Law of Ukraine: On State Registration of Human Genomic Information). Unfortunately, a significant disadvantage of this legislative act is that its norms lack a provision on a written statement of a relevant person submitted at any time before expiration of specified time limits for storage of biological material. The lack of this provision significantly limits the rights of individuals and contradicts international legal acts, for example, the International Declaration on Human Genetic Data. The provisions of Article 21 of the Declaration state that it is appropriate to provide genetic data of a person for forensic medical purposes or for the purposes of civil proceedings only for the period for which it is needed for specified purposes (regarding the institution of voluntary HGR, this means an absolute necessity to destroy genomic information at the request of an interested person). we would like to emphasize that a person submitting an application for destruction of genomic information, first of all, should not specify in it any motives and grounds for their decision, that is, reasons for withdrawing consent are legally irrelevant. Secondly, submitting an application as a legitimate way to terminate relevant legal ties should not result in any negative consequences (this nuance, by the way, was explicitly specified in Article 9 of the Declaration).

Also, provisions of the Criminal Procedural Code of Ukraine should be amended regarding the correct interpretation of actions when appointing and conducting a molecular genetic examination or when identifying an individual with traces at the crime scene.

2. Analysis of the prospects for improving the legal support for molecular genetic examination, expressed in the legislative initiative, will regulate the norm on condition that participants of pre-trial investigation oppose collection of biological material. The development of legal norms reflecting the interaction of state and private forensic science institutions is a necessary direction for the development of expert activity in today's reality.

The methodological relevance of the analyzed issues is implemented both from the theoretical and the practical component. In this regard, in conditions

[34] Case S. and Marper v. the United Kingdom (Application no. 30562/04, 30566/044), 04/12/2008, ECHR 2008. URL: https://hudoc.echr.coe.int/eng#{«fulltext»:[«30562/04»],»itemid»:[«001-90051»]}

of modern legal reality, it is vital to prioritise timely detection and objective assessment of a number of factors that negatively affect the main indicators of both law enforcement agencies and expert work in forensic science institutions of Ukraine, as well as condition of personnel training system and the development of scientific research in this field.

The practical significance of research in the field of appointment and conduct of molecular genetic examination is implementation of the developed methodology for application of specific forensic expertise while the appointment and conduct of molecular genetic examination, taking into account conditions of modern legal reality. Such an approach is aimed at creating conditions for improving the quality of the investigation of criminal offenses, will enhance work of forensic science institutions, namely will eliminate (partially or completely) negative factors associated with implementation of molecular genetic examination.

The information support of expert units is rather voluminous arrays of data, and it is inappropriate to distract specialists from research for such work. In this regard, the question arises about coordination of specialist's actions, about integration of obtained different knowledge, therefore we believe that introduction of expert integrators (coordinators) into the staff of forensic expert units is a highly urgent task.

3. At the same time, there are difficulties associated with disintegration of databases of the Ministry of Internal Affairs of Ukraine with databases of the forensic medicine bureau and forensic science institutions of the Ministry of Justice of Ukraine. Therefore, there is a pressing need to synchronize them. It is also required to improve the process of integrating genomic information of the single database of Ukrainian forensic science institutions with databases of international organizations for consolidation of information into a single DNA database, which will create conditions for enhancing the efficiency of the work of experts (minimizing the amount of work in collecting, studying and processing human genomic information and reducing terms of molecular genetic examination).

4. Studying legal regulations of the European Union and practice of the decisions of the European Court of Human Rights helps us to draw a number of conclusions about the main aspects that are important when considering cases, as well as the need for compliance with legislation and adherence to the completeness of the content of the national legislation itself in matters of collection, use and storage of genomic human information and molecular genetic examination. For this, it is crucial to observe generally recognized human rights and freedoms, ethical standards. Thus, in relation to the living, it is necessary to guarantee the prevention of unnecessary physical and mental suffering and injury during scientific research, prevention of torture, inhuman or degrading treatment or punishment. Regarding the dead: the right to inviolability of bodies of deceased persons, to respect for them. When removing organs, tissues, and using a person's body after their death, it is mandatory to define the expression of their will as a matter of consent or refusal to commit such actions given during a person's lifetime. The existence of a person's voluntary and informed consent becomes a cornerstone in cases of recognizing legality while scientific research and experiments. When collecting and storing genomic information of suspects of crimes and convicted persons, it is needed to differentiate rules for collection, storage and destruction of such information, taking into account the severity of a crime committed, distinction of measures taken in relation to persons who committed crimes and offenses, terms of storage and subsequent destruction of biological material, characteristics of the criminal's personality, etc.

References

About forensic examination. Law of Ukraine. URL: https://zakon.rada.gov.ua/laws/show/4038-12?find=1&text=незалеж#w1_1 [in Ukraine].

About the state registration of human genomic information. Law of Ukraine. URL:http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?id=&pf3511=70902 [in Ukraine].

Afanasyeva, K. V. (2019) Degradation of DNA in forensic molecular genetic examination//Theory and practice of forensic activity: materials VIII interdisciplinary. conf. (Kyiv, November 27, 2019). Kyiv, 2019. URL: http://elar.naiau.kiev.ua/jspui/handle/123456789/15303 [in Ukraine].

Case of Elberte v. Latvia (Application no. 61243/08), 13/01/2015, ECHR 2015. URL: http://hudoc.echr.coe.int/eng?i=001-150234 [in English].

Case S. and Marper v. the United Kingdom (Application no. 30562/04, 30566/044), 04/12/2008, ECHR 2008. URL: https://hudoc.echr.coe.int/eng#{«fulltext»:[«30562/04»],»itemid»:[«001-90051»]} [in English].

Convention on the Protection of Human Rights and Fundamental Freedoms (Concluded in Rome on November 4, 1950) (as amended on May 13, 2004) (together with Protocol [No. 1] (Signed in Paris on March 20, 1952), Protocol No. 4 on the provision of certain rights and freedoms in addition to those already included in the Convention and the first Protocol to it» (Signed in Strasbourg on 16.09.1963), «Protocol No. 7» (Signed in Strasbourg on 22.11.1984)) / / Bulletin of international treaties. 2001. No. 3. [in English].

Criminal Procedure Code of Ukraine. Information of the Verkhovna Rada of Ukraine (VVR), 2013, No. 9-10, No. 11-12, No. 13, Article 88 URL: https://zakon.rada.gov.ua/laws/show/4651-17?find= 1&text=sample#n2250 [in Ukraine].

Demidov, S. V. & Minchenko, Zh. M. & Havrylenko, T. I. & Topchii N. M. & Novikova, S. M. (2012) Anthropogenetics with the basics of medical genetics. Kyiv. Phytosocial Center. [in Ukraine].

Didyk, M. M. & Gorbatenko, I. Y. (2003) DNA analysis in criminology: a monograph. Kherson: Dream, 2003. 124 p. [in Ukraine].

Didyk, M. M. (2003) DNA analysis as a method of criminology in different countries // Bulletin of the National University of Internal Affairs. 2003.V. 22. Pp. 34-36. [in Ukraine].

Dr. Surat, P. & Ph. D. Reviewed by Dr. Damien Jonas Wilson, MD, Medical Life Science (2018). URL: https://www.news-medical.net/medical/authors/damien-jonas-wilson?page=24 [in English].

Draft Law of Ukraine «On State Registration of Human Genomic Information». URL: https://www.kmu.gov.ua/bills/proekt-zakonu-pro-derzhavnu-reestratsiyu-genomnoi-informatsii-lyudini. [in Ukraine].

Dyachenko, N. M. (2011) The main stages of development of molecular genetic expertise in the State Research Expert Forensic Center of the Ministry of Internal Affairs of Ukraine. Forensic Bulletin. 2011. № 1 (15). C.165-169. [in Ukraine].

EUROPOS KRIMINALISTIKOS BENDROS ERDVĖS 2020 VIZIJOS ĮGYVENDINIMO LIETUVOJE MOKSLINĖ KONCEPCIJA. Mokslo studija. Vilnius: Mykolo Romerio universitetas. 2016, 372 p. P. 354. [in Lithuania].

Features of collection in pre-trial proceedings of biological traces of the person: a method. rivers / Furman, Y. V., Yusupov, V. V., Kotlyarenko, L. T., Dmitruk, R. S. / K.: Nat. acad. internal affairs, 2016. 44 p. [in Ukraine].

Filipenko, N. E. & Spitsyna, G. O. (2022) Specific Issues Of Collection, Study And Processing Of Homenomic Information Of Human Beings. Prospects for the development of science, education and society in Ukraine and the world: a collection of abstracts of the international scientific-practical conference (Poltava, May 20, 2022). Poltava: CFEND, 2022. S. 33-35. [in Ukraine].

Galan, N. V. & Chornyi, M. V. (2017) The use of genetic examination in criminal proceedings // Criminological theory and practice: experience, current problems and ways to solve them: theses of the report of the interuniversity science-practice. conf. (Kyiv, 23.03.2017). Kyiv. URL: http://elar.naiau.kiev.ua/jspui/handle/123456789/4222 [in Ukraine].

Interpol. URL: https://www.interpol.int/en/How-we-work/Forensics/DNA. [in English].

Ivanović, A. & Merike, R. (2011) Accreditation Process Forensic Center Of Montenegro To The Mentorship Of The European Union (Projects EMFA-2). 10th Symposium of forensic sciencies. Bratislava. Symposium Journal [in English].

Juodkaitė-Granskienė, G. (2014) Dar kartą apie teismo eksperto kompetenciją. Baudžiamasis procesas: teisingumo garantas ar kliūtis?: recenzuojamų mokslinių straipsnių rinkinys. Sud. Juodkaitė-Granskienė, G. Vilnius: Vilniaus universitetas, 2014, p. 168-201. ISBN 978-609-459-453-3. [in English].

Kanava, O. Yu. (2019) Problematic issues of molecular genetic research in the identification of missing persons//Legal scientific electronic journal. Zaporizhzhia. No. 5. [in Ukraine].

Lisa R. Kreeger & Danielle, M. (2003) Weiss Forensic DNA - Be Not Afraid Fundamentals for the Prosecutor. SPECIAL T OPICS SERIES. November 2003. The American Prosecutors Research. URL: https://www.ojp.gov/ncjrs/virtual-library/abstracts/forensic-dna-fundamentals-prosecutor-be-not-afraid [in English].

Lozova, S. M. & Lozovyi, A. O. (2016) Problematic issues of preparation and conduct of molecular genetic examinations//Actual problems of law enforcement activity: theses addendum. All-Ukrainian science and practice Internet Conf. (Severodonetsk, 23.12.2016). Severodonetsk [in Ukraine].

Mc Cord, B. & Opel, K. & Funes, M. & Zoppis, S. & Jantz, L. M. (2011) An Investigation of the Effect of DNA Degradation and Inhibition on PCR Amplification of Single Source and Mixed Forensic Samples. URL: https://www.ncjrs.gov/pdffiles1/nij/grants/236692.pdf [in English].

Methodological recommendations for organizing the selection of samples of biological origin from relatives of missing persons and the appointment of molecular genetic examination, conducting activities to search for the specified citizens and responding to the facts of the disappearance of people in the areas of anti-terrorist operations/the Ministry of Internal Affairs of Ukraine, State NDEKC; National Police of Ukraine, Main Investigation Department, Department of Criminal Investigation. Kyiv, 2016. P. 8-10. Міжнародна декларація про генетичні дані людини. URL: https://www.un.org/ru/documents/decl_conv/declarations/genome_dec.shtml [in Ukraine].

Mykola Nechyporuk, Oleksandr Kliuiev, Aleksandar Ivanović, Nataliia Filipenko (2021) Development Strategy of International Cooperation of Forensic Science Institutions of Ukraine with Foreign Experts in Prevention of Terrorist Attacks on Aerospace Industry and Critical Infrastructure. Integrated Computer Technologies in Mechanical Engineering – 2021. Synergetic Engineering Pp. 825-848. Presents the proceedings of the ICTM´21 Conference held in Kharkov, Ukraine, at November 28–29, 2021. ISBN: 978-3-030-94259-5 (eBook). URL: https://link.springer.com/chapter/10.1007/978-3-030-94259-5_64. [in English].

Peculiarities of collecting human biological traces in pretrial proceedings: method. rec. / Furman Y.V., Yusupov V.V., Kotlyarenko L.T., Dmytruk R.S. K.: Nat. Acad. internal of affairs, 2016. 44 p. [in Ukraine].

Shcherbakovsky, M. G. (2015) Conducting and using forensic examinations in criminal proceedings: monogr. Kharkiv: V dele, 2015. [in Ukraine].

Stepaniuk, R. & Shcherbakovskiy, M. & Kikinchuk, V. & Lapta, S., Guseva, V. (2019) Problems of using forensic molecular-genetic examination in criminal procedure of Ukraine. Georgian medical news. 2019/5.№ 290. C. 157–163. [in Ukraine].

Stepanyuk, R. L. (2019) Features of forensic molecular genetic examination during the investigation of murders. Scientific Bulletin of Dnipropetrovsk State University of Internal Affairs. 2019. № 3. pp. 174–180. [in Ukraine].

Teslyuk, I. O. (2017) Tactical principles of the use of forensic forecasting in pre-trial investigation (on the example of the National Police of

Ukraine): monograph. Odesa: Odesa State University of Internal Affairs. 217 p. [in Ukraine].

The Parliament adopted the Law «On State Registration of Human Genomic Information». URL: https://mvs.gov.ua/uk/news/parlament-priinyav-zakon-pro-derzavnu-rejestraciyu-genomnoyi-informaciyi-lyudini [in Ukraine].

Tsilmak, O. M. (2013) General theoretical provisions of forensic forecasting // Visnyk Zaporizhzhya. national University. No. 4. P. 178-184. [in Ukraine].

Udovenko, Zh. V. (2016) Criminalistics: lecture notes. In general ed. V. I. Galana / K. Zh. V. Udovenko: «Center for Educational Literature». 320 p. [in Ukraine].

Vuyma, A. G. (2020) Peculiarities of preparation for the appointment of molecular genetic examinations in criminal proceedings initiated in connection with the commission of murders//Theory and practice of forensic examination and criminology: coll. of science publisher/editor: O. M. Klyuev, V. Yu. Shepitko and others. Kharkiv: Pravo. Issue 21. P. 79-85. DOI: https://doi.org/10.32353/khrife.1.2020_05. [in Ukraine].

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