

The right to scientific discovery as an object of legal protection: National and international perspectives

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Abstract

Introduction to the Problem: This article explores the concept of the right to scientific discovery as a fundamental aspect of human rights, examining its legal protection both at the national and international levels.

Purpose/Study Objectives: The purpose of this research is to analyze the domestic legal framework for rights to scientific discoveries and characterize foreign approaches to regulating relations related to the implementation and protection of rights to this object of intellectual property.

Design/Methodology/Approach: The methodology covers both general scientific and specific legal methods. In particular, the authors used the following methods: analysis and synthesis, formal-legal, comparative-legal, analytical-prognostic, socio-legal research, empirical, and induction methods. By analyzing national laws, international treaties, and case studies, this research provides a comprehensive overview of the legal landscape surrounding the right to scientific discovery.

Findings: The right to scientific discovery is a critical aspect of legal protection at both national and international levels. While intellectual property laws provide a primary mechanism for protecting scientific discoveries, broader human rights frameworks and international treaties also play vital roles. Moreover, significant disparities exist between countries regarding access to scientific knowledge and research capacity. Thus, international cooperation and support are crucial to mitigate these imbalances and promote global equity in scientific advancement. Finally, balancing the rights of individual inventors with the public interest, ethical considerations, and global equity remains a complex and ongoing challenge.

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Introduction

The 21st century is marked by extensive integration of innovative advancements across multiple domains of public life, alongside unprecedented progress in science and technology. In parallel, within the current trajectory of state and legal evolution, there is an increasing emphasis on the value of intangible assets. These assets now benefit from robust mechanisms for realization, protection, and preservation, implemented at both national and international levels. Together, these dynamics underscore the critical importance of intellectual property as a central representation of intangible assets, with specific forms arising directly from scientific and technological development. The tangible manifestations of intellectual property have deep roots in ancient societies: our ancestors captured elements of communal life in symbolic cave art, created ritualistic songs and dances, and engineered tools for hunting. The discovery and mastery of fire by early humans, in this sense, parallels the essence of contemporary scientific breakthroughs ([Atamanova, 2020](#)).

Although intellectual property has inherently coexisted with human society, related interactions largely remained beyond legal regulation for an extended period. States refrained from intervening in the cultivation of human intellectual and creative capacities, nor did they institute legal frameworks to safeguard the outcomes of intellectual endeavors. Instead, the protection of rights to intellectual property was regarded as a private responsibility of the creator, without state-mandated protections or oversight ([Derevyanko et al., 2022](#)).

During the bourgeois period of the formation of state and legal thought, society began to perceive intellectual property as a shared societal value rather than just a means of individual self-expression. Against the backdrop of the rapid development of science and technology, the emergence of new scientific disciplines, and the intensive growth of industry and trade during the Enlightenment, the slogan "Knowledge is power!" asserted itself in all spheres of socio-political life. As soon as the state realized that not only tangible property but also knowledge and intellectual property as a whole could have economic value, the first attempts to establish legal mechanisms of a stimulating and protective nature in the field of intellectual property relations emerged. The initial legal provisions for the protection of intellectual property can be found, notably, in the bourgeois legislation of France ([Britchenko & Cherniavska, 2019](#)).

During the same period, distinguished European scholars were shaping a diverse range of concepts regarding the socio-legal nature of intellectual property. This



concept prevailed in the science and legislation of continental European countries for a long time. Immanuel Kant and his philosophical followers, who developed a personalized concept of intellectual property, viewed this phenomenon as a moral and ethical category, focusing primarily on the moral aspects of using the results of creative and intellectual activities of individuals ([Britchenko et al., 2019](#)).

In the contemporary stage of legal philosophy development, the axiological concept of intellectual property is increasingly capturing the attention of legal scholars. Within this framework, intellectual activity and its outcomes are considered a societal value that brings benefits both to the creator and the entire society ([Antoniuk et al., 2018](#)). Consequently, the rights to intellectual property require the establishment of special mechanisms for protection and safeguarding by the state. These mechanisms aim to enhance the initiative and enthusiasm of creators or researchers on one hand, and provide society with access to socially beneficial objects of intellectual property on the other. In this context, the issue of legal protection of scientific discovery appears relevant. Scientific discovery, on one hand, is the result of the work of a specific scientist or group of scholars, and on the other hand, it holds exceptional importance for societal development, making it a common heritage of humanity ([Kunenko et al., 2022](#)).

It is not surprising that the majority of European states are increasingly directing their resources towards ensuring economic, legal, and political conditions for the development of intellectual property. The outcomes of intellectual activity have evolved beyond being a mere expression of the intellectual and creative potential of individuals. They have become a crucial component of the economic activities of an entire country, serving as a source of both domestic and foreign investments, a hallmark of a state's modernity, and an effective means of overcoming the state's resource and overall economic dependence on other countries ([Melnyk & Varibrusova, 2019](#)).

The necessity of forming and enhancing legal provisions in the field of intellectual property is driven by several factors, including:

1. The continuous development of science, technology, art, and civil circulation areas of societal life where intellectual activity takes place, and its formally and materially expressed results are applied;
2. The expansion of the list of intellectual property objects, primarily due to the emergence of non-traditional objects, necessitates proper legal regulation of the relationships related to them;
3. The emergence of new forms of unauthorized use of intellectual property objects and violations of intellectual property rights, for which preventive measures and legal responsibility are not yet provided at the national level, creates a state of "vulnerability" for the subject of intellectual property rights, and so on.



Furthermore, the development of the intellectual property institution depends on the quality of the regulatory and protective mechanisms for the rights to the results of intellectual activity. Adequate legislative support in this sphere stimulates scientific, creative, and overall intellectual endeavors at the national level, where entities are interested in creating inventions, works, trademarks, and other objects of intellectual property, with effective national mechanisms for implementation and sufficient levels of state protection.

At the same time, conflicts, gaps, and inconsistencies in national legislation in specific areas of intellectual property, as compared to recognized international standards, inevitably result in a slowdown in the development of these fields. Individuals uninterested in realizing their intellectual potential or utilizing the outcomes of their intellectual or creative activities within a country where national laws do not provide an adequate level of protection for their intellectual property rights may experience a decline in motivation. Ultimately, in countries with imperfect legal frameworks for intellectual property rights, there is a tendency for a "brain drain" towards nations where creators benefit from favorable economic, political, and social conditions for intellectual activities and feel adequately protected against infringements on their intellectual property.

To prevent this negative phenomenon, retain a generation of highly skilled specialists and scientists, who can contribute to building an innovative and strong nation, and elevate the country's reputation on the scientific stage, Ukraine should establish such "rules of the game" in the field of intellectual property that, on one hand, prevent the unlawful use of intellectual activity results and other objects of intellectual property, and on the other hand, serve a stimulating function and promote the emergence of new innovations, technologies, and the improvement of industry and civil circulation at the national level. This thesis is particularly relevant during the national regulation of relations arising from scientific discoveries since, at the current stage of the development of Ukrainian intellectual property legislation, the absence of adequate legal protection for rights to scientific discovery can be confidently stated.

The key to scientific and technological progress and innovative development across various domains of human activity lies in scientific discoveries. Since ancient civilizations and up to the present day, numerous scientific breakthroughs have been achieved in fields such as medicine, physics, astronomy, and others, contributing to the common heritage of society. People actively apply the knowledge gained through scientific discoveries for educational, scientific, domestic, and professional purposes. The positive experience of countries opting for the path of building an innovative economy and continuous scientific and technological advancement in various industrial sectors indicates that a modern state should not only focus on its military strength but also prioritize the scientific and technological potential of the country (Van Der Veen, 2022).

Simultaneously, as per official statistics, the per capita GDP of the Republic of Korea stands at \$34,800, with a projected minimum growth of 4% by 2024 (Diia. Business, 2024). Hence, one can infer that scientific discoveries and innovations will yield significantly greater advantages, particularly in terms of the economy, compared to arms races or the environmentally detrimental extraction of natural resources, coupled with subsequent export at low and enticing prices for other nations.

Within the realm of domestic science, consensus is lacking regarding the legal characterization of scientific discoveries. The doctrinal landscape encompasses divergent views, with some asserting that scientific discoveries should not be deemed intellectual property objects, while others advocate for establishing a robust legal framework to safeguard and defend rights to scientific discoveries akin to other intellectual property entities. This divergence contributes to the challenges not only in comprehending the concept of "scientific discovery" within the legal domain but also in shaping legislation and formulating specific regulatory measures related to the registration, implementation, protection, and defense of rights associated with scientific discoveries.

Therefore, the relevance of researching scientific discovery as an object of legal regulation at the national and international levels is determined by several factors:

1. The absence of a unified approach to defining scientific discovery as an object of legal protection in legal doctrine.
2. Deficiencies in national legal provisions for the protection and defense of scientific discoveries, including the lack of specific legislative regulation for relations arising from scientific discoveries, ambiguity regarding the subjects' rights to scientific discoveries, etc.
3. The unimpeded use of scientific discoveries as a societal asset, distinguishing them from most other intellectual property objects, thereby necessitating the creation of a special mechanism for the use and protection of rights to scientific discoveries compared to traditional intellectual property objects.
4. Insufficient protection of rights to scientific discoveries at the national level and low effectiveness of state control over compliance with legislation and international legal standards in the field of scientific discoveries.
5. Divergent approaches in the legislation of foreign countries to regulate relations related to the registration, use, and protection of rights of the subject who made a scientific discovery.

The purpose of this research is to analyze the domestic legal framework for rights to scientific discoveries and characterize foreign approaches to regulating relations related to the implementation and protection of rights to this object of intellectual property. The goal is to identify both shortcomings and advantages in order to provide insights that could be adopted by domestic legislative and legal practitioners.



To effectively attain the set objective, I propose outlining the following tasks for this scientific investigation:

1. Evaluate existing doctrinal approaches to characterizing the nature of rights associated with scientific discoveries;
2. Assess the current status of domestic legal frameworks governing rights to scientific discoveries;
3. Examine international practices in regulating relationships concerning scientific discoveries;
4. Highlight principal deficiencies in the domestic system for implementing and safeguarding rights to scientific discoveries in Ukraine and delineate potential avenues for their resolution.

The right to scientific discovery as an object of legal protection is a multifaceted issue that spans national and international legal frameworks. This right, while primarily associated with intellectual property law, intersects with various other legal domains, including human rights, environmental law, and international treaties. Therefore, the authors will explore the national and international perspectives on the right to scientific discovery. The right to scientific discovery is a critical aspect of legal protection at both national and international levels. While intellectual property laws provide a primary mechanism for protecting scientific discoveries, broader human rights frameworks and international treaties are also important. Thus, balancing the rights of individual inventors with the public interest, ethical considerations, and global equity remains a complex and ongoing challenge.

Methodology

The methodology of this scientific research encompasses both general scientific and specifically legal methods. In particular, the following methods were employed by the author:

1. Analysis and synthesis were employed to identify specific components of the national regulatory framework that governs relations associated with scientific discoveries in Ukraine and certain foreign countries. These methods were also applied to comprehensively examine these legal mechanisms and establish their systemic interconnections with other aspects of intellectual property legislation, such as patent law and legislation concerning copyright and related rights.
2. Induction was utilized to discern the features of scientific discovery as a subject of legal regulation and protection based on its legal and doctrinal definitions.
3. The formal-legal method was applied to scrutinize particular legislative provisions within the legal framework governing the implementation and safeguarding of rights to scientific discoveries.
4. The comparative legal method was employed to juxtapose the legislative approaches of national and foreign jurisdictions concerning the regulation and protection of rights to scientific discoveries. It was also used to draw connections between patent law, copyright law, and the rights to scientific discoveries, leading

- to the conclusion that the provisions of patent and copyright laws cannot be extrapolated to cover scientific discoveries.
5. The analytical-prognostic method was employed to identify shortcomings in national legislation regarding the regulation of rights to scientific discoveries and outline potential ways to address them.
 6. The empirical research provides the data on the legal frameworks and highlights areas needing reform or improvement. Investigating disparities in access to scientific knowledge between developed and developing countries requires empirical data collection. It includes comparative studies of research funding, patent filings, and scientific output across different regions.
 7. The socio-legal analysis explores the interaction between law and society. In particular, it focuses on how international legal frameworks address or perpetuate such disparities in knowledge. It involves studying the effectiveness of international cooperation and support mechanisms, such as technology transfer agreements and capacity-building initiatives.

The current state of scholarly investigation into the selected topic reveals a gap in understanding the regulation of rights to scientific discoveries at both national and international levels within domestic scientific circles. Nevertheless, specific facets of this scientific theme have been partially examined by scholars like Bulat (2010), Korostashova (2014), Dyrda (2014), Ostapenko et al. (2021). Furthermore, the legal regulation and protection of scientific discoveries have been explored in foreign legal doctrine, featuring contributions from researchers such as Benko, (1987), Bobrovnyk et al. (2022). The simultaneous lack of an all-encompassing investigation into the national legal framework regulating rights to scientific discoveries, juxtaposed with existing foreign approaches to the legal protection of discoveries, emphasizes the significance of this scholarly endeavor.

Results and Discussion

The Domestic Doctrinal Approaches to Defining the Legal Essence of Scientific Discovery

The effective socio-economic development of any modern state largely depends on the state of development and efficiency of intellectual and creative activity of its population (Losonczi et al., 2022). In this regard, international treaties facilitate the convergence of legal systems and accelerate the harmonization and unification of national patent systems. The Paris Convention for the Protection of Industrial Property (hereinafter – Paris Convention) of 1883 is the main international legal act in the field of industrial law. It was ratified by Law of Ukraine No 995_123 “Paris Convention for the Protection of Industrial Property of March 20, 1883. Entry into force for Ukraine of the international agreement dated 12.25.1991”.

According to the Paris Convention, objects of protection of industrial property are “patents, utility models, industrial designs, trademarks, service marks, trade names,



indications of source or appellations of origin, and the repression of unfair competition” (Article 1(2)). It formulated minimum standards of patent protection, which are mandatory for all participating states. The basic principle of the Paris Convention is that each participating country must grant citizens of other participating countries the same rights as its citizens. Participating countries undertake to protect well-known trademarks even without registration. Another important principle is the so-called right of priority, i.e., applicants who applied for a patent, trademark or other objects of industrial property in one participating country have the right to submit applications within a certain period in other participating countries with priority from the date of the first application.

The Agreement on Trade-Related Aspects of Intellectual Property Rights (hereinafter- the TRIPS Agreement) of 1994 is the next international treaty requiring full compliance with the provisions of the Paris Convention. The purpose of the TRIPS Agreement is to develop and coordinate the principles of creating a regulatory framework for the liberalization of international trade relations, establishing standards for the protection of intellectual property rights and the procedure for their enforcement. It also provides that each member state of the World Trade Organization (WTO) must comply with obligations arising from other international agreements on intellectual property rights, complementing them with TRIPS obligations. Moreover, the TRIPS Agreement ensures that strict enforcement procedures will be established and applied in each participating country to protect intellectual property rights. In addition, it enshrines a requirement to protect any invention, regardless of whether it is a product or a manufacturing process in all fields of science and technology. An important advantage of the TRIPS Agreement is the established effective dispute settlement mechanism, which facilitates controlling more effectively how states adhere to measures that ensure open access to their markets. It also contains minimum standards of intellectual property legal protection.

Furthermore, European patent regulations are largely aligned with the provisions of the TRIPS Agreement because most states are parties to the European Patent Convention of 1978. At the same time, some provisions of the European Patent Convention differ from the provisions of the TRIPS Agreement. In particular, it concerns provisions on exceptions to the patentability of inventions.

The Patent Cooperation Treaty (hereinafter – the PCT) of 1970 is another legal document that regulates intellectual property. The PCT was developed in order to unify and simplify the formalities associated with the submission of a patent application. It helps overcome the problem of multiple applications submissions, which was never provided for in the Paris Convention. After filing an application, an international search and an international preliminary examination (at the request of the applicant) is carried out, proving a conclusion of the patentability of the invention. The applicant may choose participating countries where he/she wants to obtain a patent based on an international application. Nevertheless, a number of issues



remained unresolved in the PCT. Thus, although it reduces duplications, it does not remove it completely in the patent search at the national level. In addition, the PCT does not contain provisions that reduce the cost of translating patent applications into foreign languages. There is also no mechanism for simplified resolution of disputes between the applicant and the national patent services.

Apart from that, in the context of digitalization, it is necessary to note the WIPO Copyright Treaty (hereinafter – WCT) of 1996. The WCT extends copyright protection to digital formats and the Internet and recognizes the rights of authors to distribute their works in electronic form.

These international legal instruments form the basis for harmonizing the protection of intellectual property rights worldwide, ensuring the protection of the interests of authors, inventors and rights holders. As of today, Ukraine is a member of the World Intellectual Property Organization, a party to 14 international treaties in the field of intellectual property and continues to work on joining others. Protection of intellectual property is ensured at the national and international levels through the relevant institutions.

The reference to doctrinal developments in this area is justified by the fact that scientific discovery, like any other social phenomenon, cannot receive effective legal regulation until there is a synthesis of scientific concepts regarding its legal nature. The principle of scientific grounding in legal provision ensures the systematic and effective legal regulation of relevant relations, the normative and legal framework of which is formed by legislators in collaboration with leading scholars presenting well-founded doctrinal proposals for legislative innovations.

The analysis of domestic legal research on scientific discovery allows identifying four main approaches to understanding its legal nature. The most widespread among scholars is the concept of legal protection of scientific discovery as a non-traditional object of intellectual property. The term "non-traditional intellectual property object" refers to an object that does not clearly fit into traditional categories of intellectual property, such as patents, trademarks, copyrights and trade secrets. These non-traditional objects may include a wide range of new non-traditional forms of intellectual creativity and innovation that may not be fully covered by current intellectual property law.

Advocates of this doctrinal approach, such as Suslikov and Studenyak (2020), Aksyutina et al. (2017) include scientific discoveries in the category of so-called "non-traditional" results of intellectual activity based on two main criteria that distinguish them from "traditional" objects of intellectual property: 1) the absence of proper special legal regulation; 2) the specificity of the content of rights to scientific discovery. In the majority of cases, proponents of this scientific approach believe that intellectual property rights to such objects can only be personal non-property rights,



and exclusive property rights to scientific discoveries do not arise due to the specific nature of using such objects by society at large without restrictions.

In domestic science, there is also an argument that denies the fact that a scientific discovery is the result of the creativity of a specific scientist because it is considered a creation of nature, and therefore its legal protection as a separate property right object is impossible (Nahorna, 2020). However, this approach is criticized based on the following counterarguments:

1. Scientific discovery is included in the system of intellectual property rights objects both at the national level according to Article 420 of the Civil Code of Ukraine and at the international level according to the Convention Establishing the World Intellectual Property Organization, signed in Stockholm on June 14, 1967;
2. The establishment of objective regularities, phenomena, or properties of the material world is a direct result of scientific and technological progress, numerous fundamental and applied scientific research, which would be impossible without human intellectual activity. Therefore, it is unfounded to portray the essence of a scientific discovery as exclusively the creation of nature, while denying the significance of human contribution.

Under the third perspective on recognizing a scientific discovery as a subject of legal regulation and protection, scholars tentatively categorize it within the realm of intellectual property objects, referred to as a "quasi-object of intellectual property." Given that a scientific discovery, upon its objective manifestation and dissemination to an undetermined group, transforms into the shared asset of society available for unrestricted use, it inherently lacks the formation of exclusive rights. Consequently, its classification as an object of intellectual property remains conditional (Kostiuchenko, 2023).

According to the fourth perspective, scholars contend that a scientific discovery is the creation of a scientist containing scientific information, and therefore, the legal protection of scientific discoveries should be carried out in accordance with the requirements of the Law of Ukraine "On Copyright and Related Rights." For instance, Ivashchenko et al. (2021) define scientific discoveries as the objects of copyright. It is challenging to align with this approach considering the legal definition of a work in the specific law: a work is an original intellectual creation of the author (co-authors) in the field of science, literature, art, etc., expressed in an objective form. Hence, copyright arises concerning works of science, literature, and art formally expressed in any objective (material) form.

Therefore, a work is the objectification of a person's creative labor, namely a complex of their images, thoughts, views, ideas, etc. Consequently, a scientific work is a symbiosis of the objective reflection of reality, the objects of scientific research, and the manifestation of the scientist's scientific consciousness expressed in their ideas, views, and subjective perception of certain scientific phenomena. A scientific work is

a form of objectifying the scientific consciousness of a specific subject. In turn, a scientific discovery is purely a scientific phenomenon, the value of which lies in the purely objective reflection of the regularities, phenomena, and features of objects in the material world without any subjectivity. Thus, thanks to a scientific discovery, we perceive reality as it is, not through the prism of the consciousness of the person who made such a discovery. Furthermore, including a scientific discovery among the objects of copyright contradicts international law, specifically Article 2 of the Stockholm Convention, which defines a scientific discovery as an independent and self-sufficient object of intellectual property, distinguishing it from a work as an object of copyright.

Experience in Protecting Rights to Scientific Discoveries in Some Foreign Countries: Legislation, Doctrine, and Judicial Practice

In international scientific literature and legal practice, a fourth doctrinal approach can be found, within which a scientific discovery is considered an object of patent law alongside inventions, utility models, and industrial designs. Within this approach, a scientific discovery must meet patentability criteria to obtain legal protection and state support. However, this approach has its drawbacks, and its application as a legislative concept leads to practical difficulties and ambiguous judicial practices in providing legal protection for scientific discoveries based on their patentability.

Certainly, within the legal framework of Anglo-Saxon countries, including Canada, the United States, the United Kingdom, and Australia, it is commonplace to grant patents for scientific discoveries that fully adhere to patentability criteria. Specifically, the Patent Act of Canada of 1985 emphasizes that a patent will not be awarded solely for a scientific principle or abstract theorem. Similarly, according to Article 1 of the UK Patents Act of 1977, a patent can only be issued for an invention, explicitly excluding entities that do not qualify as inventions under this law, such as purely scientific discoveries, scientific theories, or mathematical methods.

This complicates the provision of legal protection for scientific discoveries made by researchers in the field of fundamental natural or technical research without conducting experiments, relying solely on calculations, using abstract formulas, and so on. For example, in the field of chemistry, the use of pharmacophore models in drug design research is gaining popularity, where advanced computations are employed to search for chemical structures and predict the chosen biological activity, significantly expediting the process of discovering medicinal compounds. In simple terms, a pharmacophore is an abstract set of properties of a chemical or biological compound necessary to achieve a desired biological or chemical effect ([Sukma et al., 2022](#)).

Due to legislative restrictions on patent issuance for abstract theorems, the issue of legal protection for discoveries of combined molecular compounds (pharmacophores) that do not meet patentability criteria becomes more acute, as they are abstract scientific categories. At the same time, the societal benefit of this scientific discovery is extremely significant, as it paves the way for the economical



and rapid invention of biologically active substances useful for the prevention and treatment of various diseases. Even though it cannot be protected through a patent, it is possible to provide protection as a copyright.

Another example illustrating the challenges of extending patent protection to scientific discoveries involves the case "Association for Molecular Pathology v. Myriad Genetics" of 2013 where the U.S. Supreme Court unequivocally stated that a DNA segment occurring in nature is a product of nature and not eligible for a patent merely because it has been isolated by humans. However, complementary DNA (cDNA) is patentable as it is not naturally occurring. The Myriad Genetics case specifically concerns human genes BRCA-1 and BRCA-2.

Federally funded genetic research initiated in the early 1980s, Mary-Claire King and other scientists identified a segment on chromosome 17 suspected to contain the gene mutated in families with a high incidence of breast cancer ([Hall et al., 1990](#)). In this case, the Supreme Court reiterated once again that inventors must meet several statutory criteria outlined in the Patent Act to obtain patent protection. However, during the Myriad case, the court focused crucial attention on evaluating the compliance of the claimed scientific discovery with only one but the most significant criterion: whether the asserted inventions adhered to the fundamental definition of a patent-eligible subject matter. In other words, whether they were considered "inventions" under the law. The U.S. Patent Act of 1994 defines patent-eligible subject matter as "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof".

The U.S. Supreme Court has previously formulated the postulate: "everything under the sun made by man is eligible for a patent" ([Diamond v. Chakrabarty, 447 U.S. 303, 1980](#)). However, in the Myriad case, the Court focused attention on an important implicit reservation in the patent statute regarding the exception for the characteristics of laws of nature, natural phenomena, and abstract ideas. In examining this case, two judges ultimately concluded that isolated DNA could meet the patentability criteria, but each judge argued this point differently. Judge Lourie argued that the act of breaking covalent bonds during DNA isolation creates a new molecule, while Judge Moore asserted that not only fragmentation but also the apparent utility of the isolated DNA sequences is the basis for obtaining a patent ([Cook-Deegan, 2012](#)).

In turn, Judge Bryson unequivocally rejected the possibility of granting a patent and providing legal protection to isolated DNA fragments, arguing that man-made molecules are "visibly indistinguishable" from their natural counterparts. When delivering a decision on June 13, 2013, regarding the impossibility of patenting isolated human DNA, the Supreme Court considered the high social value of this scientific discovery in genetic engineering. According to the U.S. Supreme Court, granting a patent for isolated DNA and creating favorable conditions for the

monopolization of this biotechnology field would "tie the hands" of other scientists who would be unable to develop biotechnologies based on already patented human genes.

Twentieth-century Japanese legislation was also influenced by the Anglo-Saxon model of legal protection for inventions and scientific discoveries. According to the official statistics of the World Intellectual Property Organization as of the end of 2022, Japan ranks third after China and the United States in the number of patent applications filed. The Japanese approach to addressing the issue of stimulating innovative development while ensuring society's access to scientific discoveries or inventions is noteworthy. For instance, Article 69 of the Japanese Patent Law dated June 13, 1959, provides grounds for using a patented object without the consent of the patent right holder ([Kostiuchenko, 2023](#)):

1. Patent law does not extend to a patented invention for experimental or research purposes.
2. Patent law does not extend to the following products:
 - Aircraft passing through Japan or machinery, apparatus, equipment, or other products used for this purpose;
 - Products existing in Japan before the patent application is filed.
3. Patent law does not extend to inventions in medicine (related to a product used for the diagnosis, treatment, or prevention of human diseases) made by mixing two or more medicinal substances or intended for the manufacture of medicines by mixing two or more drugs.

Additionally, Article 93 of the Japanese Patent Law provides the opportunity for an individual to use an invention in the public interest, even without a non-exclusive license from the patent owner or exclusive licensee. To do so, one must apply to the Minister of Economy, Trade, and Industry and properly justify the need to grant the applicant permission to use the scientific discovery (for example, as a result of using the scientific discovery, a new-generation medical drug for the treatment of a life-threatening infectious disease prevalent in Asian countries will be invented, etc.) ([Kostiuchenko, 2023](#)).

In our opinion, the foreign experience of legal protection for scientific discoveries through the patent mechanism has significant drawbacks due to the blurring boundary between discovery and invention. Consequently, in practice, courts begin to apply the classical patentability criteria, typical for the protection of inventions and utility models, to the legal framework for safeguarding scientific discoveries, which have specific features distinguishing them from objects of patent law. Firstly, the majority of scientific discoveries cannot be directly applied in industry, unlike inventions, utility models, or industrial designs, where industrial applicability is a mandatory condition for protection.



Secondly, if a scientific discovery represents the highest level of scientific knowledge, and its value lies in the idea and knowledge that objectively reflect the material world, then the axiological nature of inventions and other objects of patent law lies in the ability to modify and improve our objective reality to create comfortable living conditions for humans. Our thesis aligns with the legal position of the High Court of Australia in the case *National Research Development Corporation v Commissioner of Patents*.

In this context, the court reached the conclusion that the challenge in awarding patents for scientific discoveries stems from the lack of a clear distinction between an invention and a discovery. This lack of precision results in confusion and difficulties in interpreting the legal safeguards for scientific discoveries according to the Australian Patents Act. In real-world scenarios, a scientific discovery can be accomplished independently of an invention, and there are instances where experimental research and testing may not be required. Occasionally, a scientific discovery may comprise fundamental abstract knowledge without an explicit indication of its immediate practical application in industry, manufacturing, or everyday life.

Another challenge in providing legal protection for scientific discoveries within the framework of patent law in foreign countries is the provision of legislation regarding the loss of patentability due to the publication of the substance of the scientific discovery before filing a patent application. In this context, a notable case is the Cohen-Boyer patent granted in the United States for the fundamental methodology of recombinant DNA. However, protection for this discovery was denied in Europe due to the early publication of application materials, resulting in the loss of material reward ([High Court of Australia, 2024](#)).

Ukrainian Model of Intellectual Property Protection for Scientific Discoveries: Current State, Shortcomings, and Prospects for Improvement

The definition of a scientific discovery as an intellectual property object is articulated in Article 457 of the Civil Code of Ukraine. It's crucial to recognize the deficiencies in the domestic legislative definition, which, while providing insights into the fundamental nature of a scientific discovery, lacks the precision of a legal definition. It falls short of delineating the legal attributes of a scientific discovery as an intellectual property object. A scrutiny of this legislative definition enables us to pinpoint specific features of a scientific discovery."

Firstly, a scientific discovery is recognized as an object of intellectual property, as indicated by the very title of Chapter 38 of Book IV of the Civil Code of Ukraine, titled "Intellectual Property Rights to Scientific Discovery" (2003). According to the Civil Code of Ukraine, the acknowledgment of rights to a scientific discovery occurs through the issuance of a diploma, following procedures established by law. The legislature, in the current version of the Civil Code of Ukraine, categorized the



protection of rights to this intellectual property object within the scope of special legislation. This is entirely logical, considering the necessity of formulating only general principles for regulating relationships related to the exercise of rights to scientific discoveries in a codified act, leaving the detailed provisions to be specified in specialized regulatory acts. However, the subsequent inaction of the legislature, which has not yet adopted the Law of Ukraine “On the Legal Protection of Scientific Discovery”, appears inconsistent and illogical.

At present, there is only one quasi-official path for scientific innovators to obtain recognition for authorship of scientific discoveries, and that is by applying to the Association of Authors of Scientific Discoveries of Ukraine. This public organization aims to encourage scientists to undergo expert examination and public registration of their discoveries. However, it is worth noting that the current state of legal protection for scientific discoveries, or rather its absence, and the lack of interest by the state in regulating relations in this field, in no way contribute to innovative development in our country. Regarding the protection of rights to scientific discoveries, our state should finally transition from the level of a public initiative project to an effective, legislatively regulated model of state support for fundamental scientific research and the protection of rights to their results.

Secondly, the dual nature of scientific discovery, encompassing both objective and subjective dimensions, is delineated as follows: on one hand, the objective aspect is defined by the content of the discovery itself, capturing the inherent laws, properties, and phenomena of the material world that exist independently of human awareness or comprehension. On the other hand, the subjective element underscores that a scientific discovery would be nonexistent without the attainment of accurate understanding and interpretation of these objectively existing processes within the material world. Thus, discovery relies not only on the reality of phenomena but also on the human endeavor to uncover and define them.

The subject matter of a scientific discovery significantly distinguishes it from other objects of intellectual property, which aim to modify our material world. In contrast, a scientific discovery aims to illuminate the existing material world without adding or altering it through intellectual or creative activities. For example, the laws of the material world represent the objectively existing connection between phenomena or properties of the material world, whereas a property of the material world is an objectively existing qualitative characteristic of an object in the material world, and a phenomenon of the material world can be defined as an objectively existing form of manifestation of the essence of an object in the material world. In this context, I disagree with the opinion of Bulat (2010), who, among the legal characteristics of a scientific discovery as an object of intellectual property, states that it is the result of creative, intellectual, scientific-cognitive activity. Creative activity always represents the realization of intellectual potential in productive human labor, directed towards inventing new images, categories, concepts, or forms—something new, unique, non-



repetitive, and original, which changes the material plane and/or contains an ideal reflection of objective reality. The very essence of a scientific discovery precludes its emergence as a result of creative activity because it neither alters objective reality nor reflects it in an ideal form. A scientific discovery opens the eyes of humanity to those regular processes and phenomena of the material world that were unknown due to a lack of scientific knowledge in the respective field.

Creative, intellectual, scientific-cognitive activity is always characterized by a voluntary nature. However, it is not accurate to claim that every scientific discovery is a result of deliberate human activity. The term "result of activity" always implies a connection between purposeful voluntary human activity and the achievement of the expected, desired, or lawful outcome of such activity. Strangely enough, history provides examples of "accidental" discoveries in science. For instance, the discovery of the property of nitrocellulose to make glass impact-resistant was made by French chemist Eduard Benedictus accidentally when he dropped a glass vial containing this substance, and to his surprise, it did not shatter but only cracked. This scientific discovery laid the foundation for the industrial production of impact-resistant glass in transportation vehicles, saving millions of lives. Therefore, it is reasonable to assert that a scientific discovery is not necessarily a direct result of scientific research or any other human activity but rather an intentional or unintentional establishment of previously unknown facts in the process of scientific or other intellectual activities.

Thirdly, according to Article 457, Part 1 of the Civil Code of Ukraine, the conditions for patentability of a scientific discovery include novelty, fundamentality, and reliability. National legislation does not provide clear criteria for novelty or indications of the fundamentality of a scientific discovery. It is considered that the novelty of a scientific discovery implies that knowledge about established, found, or revealed regularities, properties, or phenomena of the material world has not been officially disclosed to an indefinite circle of persons. Fundamentality, as a condition for the patentability of a scientific discovery, requires that new knowledge brings a genuine "revolution" in the relevant scientific field, making fundamental changes to existing perceptions of the material world and helping humanity take a significant step forward in the development of a particular science.

The fundamentality of a scientific discovery means that it literally establishes a new "theoretical foundation" in the understanding and perception of certain phenomena, regularities, or properties of the material world, as well as a "practical foundation" for the creation of new inventions, utility models, rationalization proposals, or other objects of intellectual property. In this regard, it seems entirely logical that the majority of scientific discoveries result from fundamental scientific research. Reliability of a scientific discovery involves not only the acknowledgment by the subject of the existence of certain objective processes, phenomena, or regularities in the material world but also the justification and substantiation of such conclusions on a theoretical or experimental-applied level. Therefore, not every result of scientific



research can be recognized as a discovery; only those new findings that contain reliable and verified information, bringing fundamental changes to humanity's understanding of the material world, qualify as discoveries.

Fourthly, according to civil legislation, geographic, archaeological, paleontological discoveries, discoveries in the field of social sciences, and discoveries of mineral deposits are not eligible for legal protection. In our opinion, depriving all discoveries in social sciences, geography, archaeology, and paleontology of the possibility of being recognized as objects of intellectual property rights without any exceptions is hasty and unjustified. Resolving the issue of providing legal protection for scientific discoveries should occur by establishing compliance with legislatively established conditions for protectability, regardless of the scientific field in which the discovery was made.

Therefore, summarizing the analysis of domestic legal protection for scientific discoveries, we can acknowledge the imperfections in the legal regulation of rights to this object of intellectual property. In Ukrainian legislation amendments were made to the Law of Ukraine No 816-IX "On Amendments to Certain Legislative Acts of Ukraine on Patent Law Reform". In particular, the Law reduces the list of objects that can receive patent protection, expands the list of objects that are not subject to legal protection, digitalization and electronic document management, and introduces a post-grant opposition system. In spite of this, this branch of regulation still needs improvement.

Supporting the positions of domestic scientists who recognize scientific discovery as a non-traditional object of intellectual property, we believe it is necessary to adopt a special law, such as the "Law on the Protection of Rights to Scientific Discoveries" or the "Law on the Legal Protection of Innovative Activities and Scientific Discoveries". Such legislation would finally provide legal delineation for relationships related to the establishment, examination, registration, and utilization of scientific discoveries in Ukraine, ensuring favorable legal conditions for the development of scientific research activities in the country. The adoption of a special legal act in the field of protecting rights to scientific discoveries contributes to ensuring Ukraine's competitiveness in building an innovative economic model, a trend observed in the majority of developed countries.

Implementation and Protection of Rights to Scientific Discoveries

In our opinion, this special legislative act should primarily address the following issues regarding the implementation and protection of rights to scientific discoveries:

1. Define the subjects of intellectual property rights to scientific discoveries, categorized into primary subjects (authors – natural persons whose involuntary or voluntary actions led to a scientific discovery) and derivative subjects (natural or legal persons who, based on and in accordance with the law, acquired property rights to scientific discoveries).



2. Define the content and duration of personal non-property rights to scientific discoveries (the right to be recognized as the author of a scientific discovery, the right to priority of a scientific discovery, the right to assign a name to the discovery) and property rights (the right to reward and other benefits established by the state for contributions to the development of science, the right to prevent unauthorized use of a scientific discovery, the right to compensation for unauthorized use of a scientific discovery, and other intellectual property rights established by law).
3. Define the conditions for the protectability of scientific discoveries, namely novelty, fundamentality, reliability, non-contradiction to public interests, the principle of humanity, and morality.
4. Regulate registration procedures in the field of rights to scientific discoveries, including the registration of scientific discoveries and the issuance of a diploma for a scientific discovery, administration of the State Register of Scientific Discoveries of Ukraine, issuance of a certificate for a scientific discovery, as well as regulate issues related to international registration of scientific discoveries in accordance with the Geneva Convention of 1978.
5. Regulate key stages of acquiring rights to a scientific discovery (submission of an application for the issuance of a diploma for a scientific discovery, content of such an application, conduct of preliminary, primary, repeated, additional, and control examinations, appeal of examination results, issuance of a diploma for a scientific discovery).
6. Regulate relations arising from the transfer of property rights to a scientific discovery through inheritance or contractual succession.
7. Extend the guarantees of the special law to scientific discoveries, the rights to which are certified by diplomas issued before 1991, as well as to scientific discoveries registered by the Association of Authors of Scientific Discoveries before the entry into force of this law.

The Ukrainian Approach vs. CIS Model Law

Ukraine is the only country of the former USSR that preserved the protection of scientific discoveries as objects of intellectual property ([Derevyanko et al., 2022](#)). In the USSR, there was a system for the protection of scientific discoveries, which included state registration and the issuance of copyright certificates for discoveries. This approach recognized scientific discoveries as a separate object of intellectual property. After the collapse of the USSR, Ukraine retained some elements of the Soviet legislative system. Thus, the Civil Code of Ukraine recognizes scientific discoveries as an object of intellectual property, which distinguishes it from many other countries of the former USSR.

However, it can be noted that world practice knows only one such law. This is the Model Law No. 31-14 "On the protection of rights to scientific discoveries" of 2008, developed within the framework of the Commonwealth of Independent States (hereinafter – CIS). This Model Law defines the concept of scientific discovery,



establishes the procedure for its registration, the rights and obligations of the authors of scientific discoveries. However, Ukraine considers the partial provisions of this Law to be a rudiment and it has not been ratified in Ukraine. Despite the fact that Ukraine has never been part of the CIS, some of their normative legal documents have been ratified. However, there is an ongoing withdrawal from some international treaties of Ukraine concluded within the framework of the CIS. Therefore, it is appropriate to emphasize that there are a number of differences between the Model Law and the mechanisms for the protection of the rights to scientific discoveries proposed by the authors, namely:

1. Subjects of intellectual property rights to scientific discoveries. The Model Law defines the right to scientific discovery by its author or authors and does not divide the subjects into primary and derivative. Meanwhile the law suggested by the authors aims to clearly divide the subjects into primary (authors whose actions led to the discovery) and derivative (individuals or legal entities who acquired property rights in accordance with the law).
2. The content and duration of personal non-property rights are only in general terms presented in the Model Law. It defines personal non-property rights of the author, such as the right of authorship, the right to a name and the right to inviolability of discovery. At the same time, the proposed law of Ukraine regulates personal non-property rights in more detail: the right to be recognized as the author, the right to priority, the right to assign a name to the discovery. In addition, it defines property rights, including the right to remuneration, the right to prevent unauthorized use, the right to compensation and other intellectual property rights.
3. The Model Law does not specify the stages of acquiring rights to scientific discovery, in contrast to the law of Ukraine, which establishes the main stages of acquiring rights as follows: filing an application, conducting various types of examinations, appealing the results of the examination, issuing a diploma.
4. An important aspect of the new legislative act of Ukraine on the implementation and protection of the rights to scientific discoveries are guarantees for scientific discoveries, the rights to which are certified by diplomas issued before 1991, and for scientific discoveries registered by the Association of Authors of Scientific Discoveries before the entry into force of this law. Meanwhile, the Model Law does not contain provisions on guarantees for scientific discoveries recognized before the collapse of the USSR.
5. The Model Law does not cover the issue of the transfer of property rights, while the proposed law of Ukraine regulates the transfer of property rights by way of inheritance or succession under the contract.

Thus, the law proposed by the authors is more detailed and specific in comparison with the Model Law. It covers a wider range of issues, such as the definition of subjects of law, the content of rights, the conditions of protection, the procedure for registration, the stages of acquisition of rights, the transfer of property rights and guarantees for scientific discoveries certified till the specified period. This approach

ensures more effective protection of the rights of scientists and the development of scientific activity in Ukraine.

Conclusion

The right to scientific discovery is a crucial area of legal protection at both national and international levels, intersecting diverse legal fields and presenting multiple challenges. Protecting scientists' rights through intellectual property (IP) laws while ensuring public access to scientific advancements remains a significant hurdle. Strict IP protections can restrict knowledge sharing and hinder scientific progress, making it essential to balance scientific advancement with ethical standards and environmental concerns. This is especially pertinent in sensitive fields like biotechnology and genetics, where legislation must address ethical implications. Global inequities also persist, as developed countries enjoy greater access to scientific knowledge and research capacity than developing ones. International cooperation is essential to mitigate these disparities and foster equitable scientific progress worldwide.

In summarizing key findings, scientific discoveries are classified variably within intellectual property frameworks: as natural acquisitions beyond individual ownership, non-traditional IP granting only personal rights, objects of copyright, or patentable entities. International approaches vary—some nations like Germany and France rely on general civil law protections, while the Anglo-Saxon model includes scientific discoveries under patent law, each approach with its limitations.

Ukraine, while retaining certain Soviet elements in its IP framework, recognizes scientific discoveries in its Civil Code as unique IP objects, a distinction not shared by many other post-Soviet states. Yet, current Ukrainian law increasingly aligns with European standards, distancing itself from CIS legacies and adopting progressive IP protections. Addressing these challenges requires a balanced approach that respects individual rights, public interests, ethical guidelines, and global equity frameworks, as highlighted by Article 458 of Ukraine's Civil Code, which mandates the creation of a specialized legislative act to support scientific innovation.

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