

# ABNJ Conservation of Marine Biogenetic Resources - Based on Intellectual Property Rights and Blockchain Technology

Zuoni Yuan<sup>1\*</sup>

<sup>1</sup> East China University of Political Science and Law, School of International Law, Shanghai, China

## Email Address

[rose.gh.com@outlook.com](mailto:rose.gh.com@outlook.com) (Zuoni Yuan)

\*Correspondence: [rose.gh.com@outlook.com](mailto:rose.gh.com@outlook.com)

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## Abstract:

Marine biogenetic resources include a range of macro- and micro-organisms of direct or indirect value to mankind. Considered by the scientific and industrial communities to have the potential to revolutionize the medical, pharmaceutical and chemical industries and to generate considerable profits, these resources have been the subject of patents due to their enormous economic value [1]. Some countries argue that the application of the IPR regime to MGRs may lead to a reduction in the knowledge available to the public, while others maintain that the application of the IPR regime in relation to MGRs will stimulate exploration. This requires finding a balance between the active exploitation of valuable MGRs resources and fair and equitable benefit sharing of the results. The development of blockchain technology provides an opportunity to do so, and its unique technology can effectively solve the challenge of applying intellectual property rights to marine genetic resources, as well as provide technical guarantee for the construction of the mechanism of benefit sharing. Taking into account the developed countries' claim to the principle of freedom of the high seas and the developing countries' claim to the principle of the common heritage of mankind, it provides a theoretical basis and technical support for the utilization of marine biological genetic resources and the benefit-sharing mechanism. [2]

## Keywords:

Marine Living Genetic Resources, Legal Regime, Intellectual Property Rights, Blockchain Technology

## 1. Legal Status of MGRs Regarding Regulation of ABNJs

The United Nations Convention on the Law of the Sea is often referred to as the "Magna Carta of the oceans" because it regulates all activities in the oceans and seas [3]. Under the United Nations Convention on the Law of the Sea, developing States (i.e., China/Group of 77) consider that the living marine resources of the seabed should also be protected by the principle of the "common heritage of mankind", in accordance with General Assembly resolution 27/49 of 1970, which declared that all the resources of the Area are the common heritage of mankind. [4] Developed

countries, on the other hand, have argued that the principle of the freedom of the high seas also applies to the living resources of the Area under Part VII of the United Nations Convention on the Law of the Sea. The United States, the Russian Federation, Australia, Iceland and Norway supported this proposition at the eighth session of the Conference of the Parties. [5]

## **2. Controversies in the Application of the Intellectual Property Regime to Marine Living Genetic Resources**

### ***2.1. Conflict between intellectual property law and the United Nations Convention on the Law of the Sea***

The United Nations Convention on the Law of the Sea does not address the biological aspects of the Area. Consequently, the regime applicable to these resources under international conventions is unclear. None of the relevant international conventions, including the Convention on Biological Diversity (CBD) and the TRIPS Agreement, deal directly with MGRs in areas beyond national jurisdiction, nor do they provide a comprehensive mechanism for regulating bioprospecting in these areas. Nonetheless, the United Nations Convention on the Law of the Sea, which is the “constitution of the oceans”, is generally recognized as the basis for dealing with legal issues relating to MGRs beyond the limits of national jurisdiction, and the discovery of MGRs is either governed by the principle of the common heritage of mankind, analogous to that of the mineral resources of the seabed, or the principle of the freedom of the high seas. While bioprospecting includes a component of pure research, it is unclear whether the commercial objectives of bioprospecting equate such activities with utilization, especially given that the results of bioprospecting are often highly uncertain. If bioprospecting were to be considered as marine scientific research, the granting of patents on inventions derived from such activities would be contrary to the provisions of UNCLOS on scientific research, which prohibit the use of such activities as a legal basis for any claim to any part. In addition, many States are concerned about the use of intellectual property rights as a means of privatizing genetic resources without benefit-sharing.

### ***2.2. Intellectual property rights exacerbate the prevalence of biopiracy***

Biopiracy refers to the practice of modern scientific companies and biological research institutes in many developed countries of stealing or fraudulently extracting genetic information from the genetic resources of the countries that own the genetic resources and developing biotechnological products on the basis of such information without the authorization or consent of the countries that own the genetic resources, and then obtaining a long-term monopoly over the products or methods of development through the intellectual property rights system by applying for a patent on the products or methods of development, rather than sharing the benefits of the products derived from the genetic resources with the countries that provide the resources on an equitable basis [6].

### ***2.3. Ease of exclusivity in the application of IPRs by MGRs***

Predictably, when the CBD was drafted, it recognized that the transfer of technology can be supportive of, rather than contrary to, the objectives of the CBD. It is noteworthy that the secretariat of the Convention on Biological Diversity, in examining the impact of intellectual property rights on the objectives of the

Convention on Biological Diversity, stated that "the identification and assignment of intellectual property rights will be to control access to genetic resources and to promote fair and equitable benefit-sharing. It should also be noted that the filing of a patent application should not be regarded as laying claim to the marine environment or its resources, in a sense violating article 241 of the United Nations Convention on the Law of the Sea. Indeed, the granting of a new patent, which may simply be the discovery of a new substance present in nature, is not a new invention. Thus, when a patent is granted, it does not confer on the patent holder any title to the natural resources on which the invention may be based, nor does it confer on any of the patent holders any ownership rights [7].

### **3. Blockchain Technology Becomes an Important Tool for MGRs to Apply the Intellectual Property System**

Blockchain can affect intellectual property law in many ways. As a secure distributed ledger, blockchain offers many opportunities for storing and protecting any type of data, but there are also aspects that are unique to intellectual property. In a digital environment, where the "public" domain is controlled through layers of intellectual property and contracts, physical assets can become digital assets through blockchain technology. All documents related to a particular "substance" can be digitized. The features of blockchain technology can enable both intellectual property protection for MGRs and solve the dilemma faced by benefit-sharing for MGRs.

#### ***3.1. Technology and characteristics of blockchain***

In 2008, Satoshi Nakamoto published a paper describing a form of digital currency he called "Bitcoin". His paper suggested the clever use of cryptography to create a purely virtual, decentralized currency that operates without the need for an authority to confirm all transactions, thus bypassing the middleman. The principle behind blockchain as a cryptographic technology is to set rules for opening and closing between different elements through ciphers [8].

Lockchains are the "tamper-proof boxes" that May envisioned nearly 30 years ago. They combine several existing technologies, including peer-to-peer networks, public-private key cryptography and consensus mechanisms, to create what can be considered a highly resilient and tamper-resistant database in which people can store data in a transparent and non-repudiationable manner and participate in a variety of economic transactions under pseudonyms. Blockchain is a decentralized and transparent ledger that records transactions between parties. Blocks of data are bound to each other in chains and each blockchain is encrypted. The validity of each new transaction is confirmed within the network, and transactions are added to the chain only after they have been verified within the network, so there is no centralized authority. Once added to the blockchain, the record is somewhat problematic, claiming to be immutable, it becomes permanent. Any attempt to tamper with the data will result in a reaction, which will unpredictably affect the entire chain, which makes it difficult to change the record. The blockchain is pseudonymous, and each block has a unique fingerprint called a "hash value". The hash value is generated by a hash function that acts in one direction only, accepting any input and producing an output whose origin is virtually untraceable, and which contains all the transactions contained in the block in the form of a series of characters and numbers, thus protecting the data from being seen by other users on a transparent ledger [9].

This section should contain sufficient details so that methods can be appropriately cited and readers can assess whether the materials and methods justify the conclusions or not. [2] It can be divided into subsections if several other methods need to be described. You need explain how you studied the topic, identify the procedures you followed, and structure this information as logically as possible. [3]

### ***3.2. Blockchain technology breaks through the dilemma of intellectual property protection for MGRs***

First, blockchain technology is utilized to simplify the registration process by providing timestamps for patents of inventions and copyrighted works of MGRs. In addition, blockchain technology may address the lack of transparency of online platforms that act as intermediaries for copyright information and limit their ability to unilaterally change the rules or policies governing the use of the platform. Any user can register their work on the blockchain, thereby creating tamper-proof evidence of possession at the time of recording, and may even include specific details such as percentage of ownership Blockchain hash algorithms and timestamps address the problem of corroboration of intellectual property rights of MGRs. Second, protect MGRs intellectual property rights from being abused. Blockchain technology has a proof role for intellectual property infringement. The hash value and timestamp in the blockchain, as proof of the existence of data at a specific time, can not only prove when the patent was applied for, but also the stored information is traceable. The relevant stored data will include who accessed the data at what time, thus providing an easier tool for proving patent infringement [10]. Thirdly, the use of blockchain technology to build a shared resource base for benefit-sharing. The ultimate purpose of applying the intellectual property rights system to MGRs beyond national jurisdiction is to serve the sustainable utilization of marine biodiversity and resources as a whole, and the benefits brought about will ultimately benefit all mankind. Combining blockchain technology with the intellectual property system can, on the one hand, incentivize right holders to actively explore valuable MGRs, and on the other hand, it can also be used to build a shared resource pool to achieve benefit sharing, and strike a balance between developed and developing countries. The impact of blockchain technology on the construction of benefit-sharing mechanism is reflected in its open sharing of information on collected MGRs. Samples and raw data are released to the public domain through open access biorepositories and databases. Connecting collections across the globe will strengthen the network of existing and newly created biorepositories, creating a “public pool” of MGRs [11]. The essence of blockchain technology is a large-scale intelligent database, and the storage and analysis of information is its most basic function. Secondly, the impact of blockchain technology on the construction of benefit-sharing mechanism is also manifested in the supervision and control of benefit-sharing behavior.

## **4. Conclusions**

The protection of marine living genetic resources (MGRs) beyond national jurisdiction has become one of the points of contention at the BBNJ Conference. In the face of conflicting interests between developed and developing countries, whether to apply the principle of freedom of the high seas or the principle of common heritage of mankind to MGRs is crucial, but there has not been a reasonable solution. And the development of blockchain technology creates an opportunity for the solution of this dilemma. First, the hash algorithm and timestamp in blockchain solve the problem of

confirming MGRs' rights; second, blockchain stores information with traceability, which provides a channel for proving patent infringement; and lastly, blockchain technology can establish a shared database of MGRs by storing intangible intellectual property rights securely, which achieves the effect of benefit sharing. Combining the protection of intellectual property rights of MGRs and blockchain technology not only eliminates the concerns of developing countries about the exclusive possession of intellectual property rights of MGRs by developed countries, but also incentivizes developed countries to actively explore marine biogenetic resources, achieving a mutually beneficial and win-win situation

## Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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