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INTERNATIONAL SCIENTIFIC COOPERATION OF UKRAINE: PERIODICAL PUBLICATIONS OF THE NATIONAL ACADEMY OF SCIENCES OF UKRAINE IN SCIENTIFIC BASES

Introduction. *The rapid development of information technologies and the intensification of international cooperation between Ukraine and Europe have led to the need for increasing the competitiveness of Ukraine in the information market. The main component of the information market is databases, the entry of which will contribute to the development of the country in the global information space.*

Problem Statement. *Information activity is a branch of social production associated with the preparation and provision of information services and products that satisfy a certain group of social needs. To ensure high-quality scientific space and competitiveness, it is necessary to objectively evaluate the state of scholarly research periodicals of Ukraine. At present, the problem of presenting periodicals in the world information space, in particular, access to universally recognized scientometric databases is of paramount importance.*

Purpose. *Determination of the current state of international scientific cooperation in the context of the scholarly research periodicals of the National Academy of Sciences of Ukraine in the world of scientometric databases.*

Material and Methods. *The information framework of the research includes the legislative acts, the resolutions of the Cabinet of Ministers of Ukraine and the orders of the Ministry of Education and Science of Ukraine, the paper versions of the journals of the National Academy of Sciences of Ukraine and their sites, the information resource Scholarly Research Periodicals of Ukraine by the Vernadsky National Library of Ukraine, Web of Science, SCOPUS, Google Scholar (Google Scholar), Index Copernicus, Open Access Journals (DOAJ), ERIH PLUS.*

Results. *The introduction of scholarly research periodicals to international abstract and scientometric databases and their actual state has been described.*

Conclusions. *The introduction of information technology, access to databases and the stimulation of their development of magazines open up ways to increase (intensify) international scientific cooperation in the scientific domain by broadening the presentation of the results of researcher activity in scholarly research periodicals.*

Keywords: *informational activity, international scientific cooperation, the NAS of Ukraine, scientific periodicals, and scientometric databases.*

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The rapid development of information technologies and the intensification of Ukraine's international cooperation with Europe necessitate increasing Ukraine's competitiveness in the information market. The main purpose of international scientific cooperation in the field of publishing is the proper representation of the state in the international information space. The main tool for organizing international scientific cooperation is the distribution of publishing products, the participation in scientific conferences and workshops, and the dissemination of scholarly research products via the Internet. Scholarly research periodicals play an important role as a means of communication. Everyday, there appear new opportunities for modernization, update, and integration into the information space. Traditionally, it is considered a component of the information space, information policy, and security. Much less often, it is mentioned as part of international cooperation, although the inclusion of periodicals in international databases, catalogs, registers of scholarly research publications becomes a more and more important feature of international cooperation due to integration processes and open science. An effective way of presenting domestic R&D developments in the international information space is the entry of scholarly research periodicals into generally accepted scientometric databases. The establishment of a network for distribution of domestic publishing products abroad and foreign publications in Ukraine contributes to intensifying cultural and scientific exchange with other countries. Specific measures aiming at honorable presentation of R&D achievements in the world not only increase the awareness of the scientific community about them, but also contribute to the growth of the prestige of R&D and science in Ukraine and Ukraine's science abroad.

Information activity is a branch of social production, which is associated with the preparation and provision of information services and products that meet a certain group of social needs. Therefore, the coverage of R&D results in the form of scholarly research publications is used to

assess the effectiveness of R&D institutions, higher education establishments, projects, laboratories, scientific schools, and researchers. The tools of relevant research and evaluation, both bibliometric, scientometric, are the tools that provide the community with databases. At the same time, entering these databases is a measure of the effectiveness of R&D work. According to researchers [1], now the mobility of researchers opens the way to work together in international groups and corporations, to take part in various international events, to present the results of their research at conferences and in international publications, both in journals and in collective monographs [1].

As leading scientific institution of the state, the National Academy of Sciences of Ukraine has been taking part in the creation and testing of methods for evaluating the effectiveness of R&D institutions. This evaluation is used during the state certification of scientific (research, R&D, technological, practical) institutions subject to the Procedure for state certification of R&D institutions as approved by the Resolution of the Cabinet of Ministers of Ukraine of July 19, 2017 No. 540 [2]. While evaluating the institution and making a classification assessment, the following indicators of publishing activity shall be taken into account: the number of publications in scholarly research periodicals included in the List of Professional Scholarly Research Periodicals of Ukraine for the last three years per one researcher (the ratio of the number of publications to the number of researchers); the number of publications in foreign scholarly research journals indexed in the scientometric databases *Web of Science Core Collection* (WoS CC) and *Scopus*, for the last three years, per one researcher (publications / researchers); the number of scholarly research periodicals founded (co-founded) by R&D institution in the scientific field indexed in the scientometric databases *WoS CC*, *Scopus*, *ERIH PLUS*, *PubMed*, *MathSciNet*, *Chemical Abstracts*, *GeoRef*; the number of researchers (primary place of employment) who are members of the editorial boards of scholarly research journals indexed in scientometric

databases *WoS CC* and / or *Scopus* and are not published by this R&D institution, for the last three years (researchers), etc. [3]. As of today, many institutions of the National Academy of Sciences of Ukraine have shown a mostly high level of efficiency of their activities. As a result of evaluation according to this Methodology, 43 R&D institutions have received category A (88% of the total number of evaluated R&D subdivisions of these institutions) [4].

According to the Statute of the National Academy of Sciences of Ukraine, since 1918 scholarly research and publishing have been recognized among the principal activities and statutory objectives. It is not only a way to publish the results of scholarly research works, but also a strategic direction for the further development of science and the state [5].

The development of science in the case where funding is allocated depending on the visibility of the published results determines the growing popularity of publications indexed in international scientometric databases, including high-ranked journals. As mentioned above, the method for evaluating the activity of R&D institutions and higher education establishments, which has been introduced in Ukraine, implies the use of scholarly research periodicals to assess the quality of professional activity of researchers. As the demand for databases grows, their number increases. However, often the quality worsens, so to choose a database that meets the fields of science and the needs of a particular publication, one needs to know the differences between different types of databases and to focus on their features.

The aim of the study is to determine the current state of international scientific cooperation in terms of scholarly research periodicals of the NAS of Ukraine in the world scientometric databases to form a framework for objective assessment of the real status of their presentation in the international scientific space; to develop practical recommendations for scholarly research journals to enhance their representation in various databases at the international level.

In the course of this research, the author has studied and used paper versions of journals of the National Academy of Sciences of Ukraine and their websites, information resource *Scholarly Research Periodicals of Ukraine* of the Vernadsky National Library of Ukraine, search platforms *Web of Science*, *SCOPUS*, *Google Scholar*, databases *Index Copernicus*, *Directory of Open Access Journals (DOAJ)*, and *ERIH PLUS*, insofar as they publish information important for the study, and the information contained therein can be verified using several sources (databases). Thus, the primary sources of information are paper versions of journals, their websites and the *Scholarly Research Periodicals of Ukraine* database to which the journals provide information. The collected data have been verified on *Web of Science*, *SCOPUS*, *Index Copernicus*, *Directory of Open Access Journals (DOAJ)*, and *ERIH PLUS*.

The study has revealed discrepancies in the information available in different sources and the lack of relevant information on some resources. The reasons for these discrepancies are, obviously, untimely and/or selective update of information, as well as incorrect presentation of information, sometimes, misinterpretation of certain parts of databases as major resources, confusion of abstract and scientometric databases, etc. For example, the *Directory of Open Access Journals (DOAJ)* is an international disciplinary platform for creating open access journals and, at the same time, a database. Using the platform is not equivalent to entering this database. Entering the database and indexing in it are not the same thing. A publication may be registered in *Web of Science* as part of another database, such as, for instance, *PubMed* that is now integrated with the *Web of Science* platform. However, this does not imply indexing in this database. After all, scientometric indices are calculated only for those indexes (registers) that are part of *WoS CC*. Therefore, if a publication is available on the above platform as part of another database, this fact does not mean it is indexed in the *Web of Science* and meets the requirements of the MES of Ukraine to the category

A of professional scholarly research publications as approved by the Resolution on Approval of the Procedure for Forming the List of Professional Scholarly Research Publications of Ukraine dated 15.01.2018 No. 32 [6].

There are hundreds various scientometric databases in the world. In terms of thematic areas the databases can be multidisciplinary (for example, *WoS CC* and *Wilson Applied Science & Technology*) or specialized (*EBSCO*, *GeoRef*, *WorldCat*, *PubMed*, *Chemical Abstracts*, etc.); tied to a specific language of publications; aggregate only metadata or full texts of articles; be free access (*Open Directory Journals* (DOAJ)) or subscribed (*MathSciNet*). However, the most important classification concerns the level of information processing (catalogs, abstract databases, scientometric databases).

The scientometric database is a bibliographic database with tools for tracking the citation of articles published in scholarly research journals [7]. The most well-known scientometric indicators are the impact factor, the Hirsch index, and the citation index. There are other similar indicators used by different bases to measure the frequency of publications or references to a publication, institution, researcher, school, etc. They are mostly based on determining the relationship between the number of published articles and the number of references to them (citations). Scientometric databases also contain a variety of tools that help process the information aggregated in them at different levels, in particular, author profiles as a means of organizing researcher's publications, insofar as while doing research, researchers need collecting their published works, quoting previous research papers, publishing and evaluating the results of their research. There are similar profiles of research institutions, which provide additional information for decision-making to organizers of R&D projects, directors of research and educational institutions, as well as funding organizations.

Specialized databases are databases for accumulating information that meets certain require-

ments or criteria of a particular industry (*EBSCO*, *GeoRef*, *PubMed*, *ChemWeb*, *WorldCat*, *OCLC*, *IEEE*, and others). They often combine abstract with full-text information, because they originated from abstract publications or thematic library catalogs and are designed to raise the awareness of researchers in a particular field worldwide. In order to effectively develop international scientific relations, it is necessary to encourage the publishing activity of researchers and to intensify the presentation of their materials in publications that are part of both specialized and multidisciplinary databases.

Because of different thematic areas, different languages of publications, paid or free use, these databases are characterized by uneven popularity and demand. The most famous ones in Ukraine are the two largest multidisciplinary scientometric databases with clear selection criteria, *WoS CC* and *Scopus*, as well as a common aggregator, *Google Scholar* open access search engine and *Index Copernicus (IC)* open scientometric database of user information.

Web of Science is a platform that gives access to abstract databases of publications in scholarly research journals and patents, including databases that take into account the mutual citation of publications. Until 2016, it belonged to *Thomson Reuters*. In November 2016, *IP & Science* to which the platform belonged was renamed *Clarivate Analytics*, as a result of the reorganization. *Web of Science* covers materials from natural, engineering, biological, social, humanitarian sciences, and arts. The platform is equipped with multi-level built-in capabilities for searching, analyzing, and managing bibliographic information [1, 8].

Web of Science Core Collection is a key collection based on *Web of Science* platform and its main part. It consists of indexes (registers) of periodicals in various fields of science: natural and engineering sciences (*Science Citation Index Expanded* (SCIE)), social sciences (*Social Sciences Citation Index* (SSCI)), and humanities (*Art and Humanities Citation Index* (AHCI)). Since 2015, *WoS CC* has been expanded by creating a mul-

tidisciplinary *Emerging Source Citation Index* (ESCI) [9].

Other components of *Web of Science* platform are *BIOSIS Citation Index*, *Chinese Science Citation Database*, *Data Citation Index*, *Russian Science Citation Index*, and *SciELO Citation Index*. Specialized and regional indices include *Biological Abstracts*, *BIOSIS Previews*, *CABI: CAB Abstracts and Global Health*, *FSTA* (the food science resource), *KCI* (Korean Journal Database), *Zoological Record*, *Medline*, and *Inspec*. Also, there are additional resources: *Current Contents Connect* and *Derwent Innovations Index*. However, as stated above, these components are not scientometric databases.

Scopus is the world's largest abstract database and scientometric platform in terms of the number of published publications. *Scopus* indexes scholarly journals, conference proceedings, and serial books and provides a comprehensive overview of the results of world research in various fields of science, technology, medicine, sociology, arts, and humanities [1, 10]. *Scopus* is developed and owned by *Elsevier Publishing Corporation*.

It should be noted that if a periodical is indexed in scientometric databases *WoS CC* and *Scopus*, it belongs to category A of the list of professional scholarly research publications of Ukraine in accordance with the Resolution of the MES of Ukraine on Approval of the Procedure for Forming the List of Professional Scholarly Research Publications of Ukraine dated 15.01.2018 No. 32 [6].

These two most well-known scientometric bases carefully select scholarly research publications for inclusion in their lists and indexation. For example, *Elsevier* evaluates journals based on the following components: the International Standard Serials Number (ISSN); approach to peer review; international members of the editorial board (except for the journals specialized in regional issues, but the subject should be of interest to the international community); international authors (with the same exception as for the editorial board); fixed periodicity and regularity of periodical's issues; high-quality, professional, in terms of pub-

lishing, design of article; and English-language web resource [11]. *WoS CC* also clearly defines the selection criteria: the journals shall have a peer review of scientific content, i.e. there shall be in place a transparent, clear, mandatory review process; comply with generally accepted practices of publishing ethics and technical requirements for the preparation of publications; contain complete bibliographic information in English; be recommended by the scholarly research audience of *Web of Science* users [12]. Of course, this cannot secure a high quality of all published materials, but still ensures their compliance with the minimum formal requirements for periodicals (frequency, review, and availability of metadata).

Google Scholar is a free access search engine that indexes the full text of scholarly research publications in all formats and disciplines. *Google Scholar* covers articles that are published in journals stored in repositories or on the websites of research teams or individual researchers. The *Google Scholar* search engine shows the title, text snippet, and hyperlink to document. References to free full-text publications are marked [13]. Every periodical can join the *Google* search engine, there are no selection criteria or special conditions for joining the system. In fact, today, it is a bibliographic database that contains scientometric tools enabling users to count citations and to calculate the Hirsch index and some other indicators. Easy registration and user-friendly interface have determined a widespread use of the system by many researchers around the world. However, it is often considered as a search engine, because the lack of requirements for entry and a generally low level of identification of materials lead to inaccuracy of scientometric indicators calculated within *Google Scholar*. That is why some publishers of academic literature did not allow the system to index their periodicals (for example, *Elsevier* until 2007). The most common mistakes here are consideration of articles by other researchers in a researcher's profile and disregard of his/her own publications. Hopefully, in the future, as author profiles and digital identifiers of articles are widely introdu-

ced these mistakes disappear. However, this will not solve the main source of inaccuracy of data in this system, as *Google Scholar* indexes all periodicals, including so-called “predatory” and “faked”, which are mentioned in Jeffrey Beall’s list.

Jeffrey Beall suggested a simple list of criteria for identifying potentially predatory journals and publishers: promise of a very fast publication of the manuscript, concealment of the cost of publication, lack or incomplete presentation of editorial board, false scientometric indicators and peer review systems, plagiarism in published works, concealment of the actual location or indication of publisher’s fictitious address. The validity of Jeffrey Beall’s criteria has often been criticized, especially by publishers mentioned in his lists. In January 2017, Jeffrey Beall decided to close his project for unknown reasons, but his criteria for identifying potentially predatory publishers and periodicals are still used and available on many web resources [14].

Index Copernicus International (ICI) is a platform for publishing information about journals. It is established in 1999, in Poland. It is currently positioned as an international scientometric database for indexing, ranking, and abstracting journals, as well as a platform for scientific cooperation and implementation of joint research projects. The database has several tools for assessing performance, which allow tracking the impact of scholarly research papers and publications of individual researchers or research institutions [15].

Selection to the *Index Copernicus* database is much easier than to *WoS CC* and *Scopus*, and the database is more democratic. Therefore, today, it has included many periodicals of the National Academy of Sciences of Ukraine and Ukrainian scholarly research periodicals of other subordination. However, such a democratic policy leads to the fact that the already mentioned “predatory” and “faked” periodicals can easily get into *Index Copernicus*. In this regard, it should be borne in mind that the entry of publications into databases containing “predatory” and “faked” publications that are suspected of dishonest practices can be

seen as a negative factor by experts of *WoS CC* and *Scopus*. Thus, the editorial boards of scholarly research periodicals shall carefully check the databases that they are going to enter.

Directory of Open Access Journals (DOAJ) is an international multidisciplinary directory of open access journals. It was opened in 2003, at Lund University (Sweden). Today, this database has counted about 13 thousand open access journals, covering all fields of science, technology, medicine, social sciences, and humanities [16]. This platform is defined as a priority in *Plan S*, an initiative of the European Union to present the results of research in the public domain [17]. According to this initiative, since January 1, 2020, all research results that have been funded or are funded by public grants and grants provided by national and European research funds shall be published exclusively in open access journals and on relevant open access platforms, in particular, *DOAJ*.

Open journals and repositories that do not meet the publishing standards and the principles of scientific ethics in terms of review, copyright protection, and anti-plagiarism, are not eligible for *Plan S*. Hence, European researchers will not publish their articles in such periodicals. However, among them, often there are open Ukrainian publications.

ERIH PLUS (original name: *European Reference Index for the Humanities* or *ERIH*) is a system for abstracting and indexing, which contains bibliographic information about academic journals in the field of humanities and social sciences [18]. Recently, the base has started developing scientometric tools. Today, the authority of this base has been growing worldwide. For example, Poland intends to consider entering *ERIH PLUS* on a par with *WoS CC* and *Scopus* for humanitarian journals from the national list of scholarly research periodicals. The Scandinavian countries also pay attention towards this base. Therefore, the Scientific and Publishing Council of the National Academy of Sciences of Ukraine has already submitted a respective proposal to the Ministry of Education and Science of Ukraine, to include lis-

ting of domestic socio-humanitarian periodicals in the *ERIH PLUS* database as a criterion for referring to class B [19].

The general characteristics of the above mentioned scholarly research periodical databases are given in Table 1.

Domestic resources and aggregators of scholarly research periodicals. Ukraine has its own databases and various catalogs. Thus, the catalog of the Vernadsky National Library of Ukraine (VNLU) widely represents Ukrainian books, scholarly research periodicals of Ukraine, journals, abstracts of dissertations, and so on. On the basis of VNLU, the open base *Scholarly Research Periodicals of Ukraine* and the information-analytical system *Bibliometrics of the Ukrainian Science* have been organized. The VNLU and the Institute of Information Record Problems of the NAS of Ukraine jointly operate the system of reviewing Ukrainian scholarly research literature *Source* that aims at achieving a new level of completeness of public information about the R&D achievements of Ukrainian researchers.

Also, among the largest institutions of Ukraine in terms of collected printed products there is the Ivan Fedorov Book Chamber of Ukraine, which for over 100 years has been acting as state archive of printing of Ukraine. Pursuant to the Law of Ukraine on Mandatory Copies of Documents, the Book Chamber, as well as the VNLU, receive all printed materials of Ukraine. The Book Chamber is responsible for statistical accounting of publications, maintains databases of electronic catalogs and current state bibliography, promotes international cooperation and mutual exchange of scientific and R&D information. Recently, a pro-

ject has been launched to digitize and to make public the catalogs of the Book Chamber, including annual records of articles in periodicals.

The National Repository of Academic Texts is a nationwide Ukrainian electronic database in which all academic texts are accumulated. It was created on the basis of the Ukrainian Institute of R&D Expertise and Information (UkrIRDEI) in accordance with the Resolution of the Cabinet of Ministers of Ukraine dated 19.07.2017 No. 541 [20]. The main goal of the National Repository is to develop educational, scientific, R&D and innovation activities by improving access to academic texts and promoting academic integrity.

For the publications referred to the category B of the List of Professional Scholarly Research Publications of Ukraine, it is mandatory to enter the national databases *Scholarly Research Periodicals of Ukraine* (by VNLU) and the *National Repository of Academic Texts*.

Scholarly Research Periodicals of the National Academy of Sciences of Ukraine. Currently, the NAS of Ukraine and its institutions are co-founders and produce 13% of the total number of scholarly research periodicals in Ukraine. In total, it has countered 341 periodicals of various types, volume, circulation (from fifty copies to half a thousand), periodicity (from annual to monthly), fields of science from the scope of the NAS of Ukraine, languages, and principles of distribution [21]. The National Academy of Sciences of Ukraine, as a legal entity, has co-founded 84 of them. These scholarly research journals are analyzed below.

All these publications have ISSN for the printed version, and almost all have already received

Table 1. Scholarly Research Periodical Databases (as of 15.05.2019)

Database	Country of origin	Field	Number of periodicals
<i>WoS CC</i>	USA	Multidisciplinary	Up to 12 700
<i>SCOPUS</i>	Netherlands	"	Up to 22 200
<i>Google Академія</i>	USA	"	No official information
<i>Index Copernicus (ICI)</i>	Poland	"	6 504
<i>Directory of Open Access Journals (DOAJ)</i>	Sweden	"	13 167
<i>ERIH PLUS</i>	Norway	Humanitarian and social sciences	7 167

ISSN for the electronic version. So, they have been recorded in the ISSN International Center Register and Ulrich's Periodicals Directory. Sixty-nine journals have their own electronic resources; fourteen periodicals have their sites on the founder or publisher resources. Only one journal has not had any resource. Most periodicals have already created a complete English-language version of web resources, been updating the necessary information, expanding the archives, timely providing information on new issues. Many journals are publicly available, 43 academic publications have received and registered digital object identifiers (*doi*) for research papers, and therefore listed in the *CrossRef* register. Almost all these publications have been presented in domestic aggregators and make efforts to improve their status in the List of Professional Scholarly Research Publications of Ukraine (as of May 7, 2019, 25 journals of the NAS of Ukraine were referred to the category A, and 4 periodicals were assigned with the category B [22]), insofar as its requirements partially coincide with those of leading scientometric databases.

Traditionally, the R&D institutions of the National Academy of Sciences of Ukraine and, accordingly, the periodicals initiated by them, are grouped into the three scientific areas: physics, engineering, and mathematics; chemical and biological sciences; and social sciences and humanities. These areas include 80 journals, 4 periodicals are general academic and multidisciplinary (*Bulletin of the NAS of Ukraine, Reports of the NAS of Ukraine, Science and Innovation, and Space Science and Technology*). More detailed distribution of

scholarly research periodicals by field of science is given in Table 2.

In total, out of the 84 journals, 23 scholarly research periodicals co-founded by the National Academy of Sciences of Ukraine have been listed in *Web of Science* and 20 ones in *WoS CC*.

Scopus currently includes 27 scholarly research journals of the National Academy of Sciences of Ukraine. Within 1950–1990, *Scopus* listed 8 Ukrainian journals, and 19 periodicals were added since Ukraine gained independence, including 6 of them, in the last 10 years.

It is important that 31 journals have been included in both databases at the same time. Among them, there are 19 publications in the field of physics, engineering, and mathematics, 11 periodicals in the field of chemistry and biological sciences, and 1 journal in the social and humanitarian field.

Thus, two scientometric databases that are mandatory for the category A of the List of Professional Scholarly Research Periodicals of Ukraine currently have indexed 31 journals of the NAS of Ukraine. Every year, they count 196 issues and over 2000 articles, including 130 issues and 1500 articles in physics, engineering, and mathematics; 60 issues and 500 articles in chemical and biological sciences, 6 issues and 90 articles in social sciences and humanities.

It should be noted that both databases practice reviewing the indexed publications, so they can exclude journals from their registries and stop indexing. Having been excluded from the register, journals may re-apply for membership in the database only after two years, on general terms. However, in this case, they have lesser chance of inc-

Table 2. Distribution of Scholarly Research Periodicals by Fields of Science

Field of science	Total number of periodicals		Web of Science Core Collection		Scopus	
	Number	% of the total number	Number	% of the total number	Number	% of the total number
Physics, engineering & mathematics	42	50.0	15	35.7	16	38.1
Chemistry and biology	22	26.2	3	13.6	11	50.0
Social sciences and humanities	16	19.1	1	6.25	—	—
General academic	4	4.7	1	25.0	—	—

clusion. Anyway, the materials that have already been indexed by the database remain in it forever.

Google Scholar processes almost all journals of the National Academy of Sciences of Ukraine (79 periodicals or 94.1% of the total publications).

At the end of 2018, *Index Copernicus* included 10 journals (11.9%). Given the above considerations concerning the “predatory” publications, the fact that only a few journals of the National Academy of Sciences of Ukraine are listed in this database can be deemed positive.

At the same time, the presence of only 8 (9.52%) academic journals in *DOAJ*, given the requirements of *Plan S*, definitely leaves much to be desired. *DOAJ*, as a promising open scientific platform recommended for publishing R&D results in the EU countries, is an important area for the development of international scientific cooperation.

It is obvious that because of the relatively recent appearance of information about *ERIH PLUS* database in Ukraine, today, it has listed only two journals of the National Academy of Sciences of Ukraine (2.4%). As in the case of *DOAJ*, it is promising in terms of the possibility of enhancing the representation of the results of Ukrainian humanitarian research in the international space through this base.

In addition to these well-known databases, scholarly research periodicals of the National Academy of Sciences of Ukraine have been included in many thematic specialized databases, catalogs, registers, which are often multidisciplinary search engines or aggregators. In accordance with the Procedure for the Formation of the List of Professional Scholarly Research Periodicals of Ukraine, the entry of periodical to specialized international databases is a mandatory requirement for the category B.

The *EBSCO* database that includes publications in physics, chemistry, medicine, and economics, has indexed 17 journals of the NAS of Ukraine. *GeoRef* [23] is the most complete database in the field of Earth sciences, created in the 1960s by the US Geological Survey, has included 3 periodicals of the NAS of Ukraine. In the

field of chemical, biological, and medical sciences, the most well-known and authoritative databases are *WorldCat* (6 journals of the NAS of Ukraine), *ChemWeb*, and *PubMed* (4 journals in each database, respectively). It should be noted that both specialized and multidisciplinary databases can be divided into structural parts (by a narrower thematic category, types of publications, etc.), with each of them having its own register. Listing in each structural part is not the same as in a separate database, as sometimes misstated in journals.

Online Computer Library Center (OSLC) is an online computer library center. It is a non-profit organization specialized in automated library services and research in this area. The main purpose of its activities is to promote the expansion of access to world information and to reduce the cost of information services for researchers [24]. *OSLC* includes 10 journals of the NAS of Ukraine.

Listing of periodical in many different databases is a positive phenomenon, since it provides more ways to disseminate information, expands the readership, and simplifies user access to the journal. However, it is necessary to carefully analyze the databases, to monitor their development, changes in the conditions of entry into them and indexation indicators. It is also important to correctly indicate links to each database in journals, on their web resources and in various information directories, as well as to update the information in a timely manner.

Thus, the globalization processes and unification of requirements for scholarly research periodicals of different publishers, platforms, and databases significantly expand the possibilities of entering more databases by step-by-step compliance with their requirements. For effective international scientific cooperation, periodicals need to meet the standards and requirements of world abstract and scientometric databases: ISSN, fixed frequency and regularity of publication, quality design of articles, and the availability of English web-resource. These requirements are easily achievable for the journals of the NAS of Ukraine.

As of today, 31 journals have been listed in *Web of Science Core Collection* and *Scopus* (assuming that the journals are included in the two databases simultaneously), 11 ones have been recorded in promising databases *ERIH PLUS* and *Directory of Open Access Journals* (DOAJ) and 34 periodicals are included in specialized databases.

Thus, the introduction of information technology and the development of journals open up prospects for intensifying international scientific cooperation in the research field through broader coverage of R&D results in scholarly research periodicals. Compliance with the Resolution of the Ministry of Education of Ukraine on Approval of the Procedure for the Formation of the List of

Professional Scholarly Research Periodicals of Ukraine is a precondition for periodical's efforts towards enhancing its visualization in the world information space.

Today, the main unit of communication is a scholarly research article published in a rated periodical indexed in authoritative databases. Being deeply involved in international R&D projects and such communication is the key to successful international scientific cooperation. Strengthening the cooperation in the publishing business by entering the international scientometric databases contributes to the dissemination of R&D results of Ukrainian researchers and to the further development of fundamental research.

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МІЖНАРОДНЕ НАУКОВЕ СПІВРОБІТНИЦТВО УКРАЇНИ: ПЕРІОДИЧНІ ВИДАННЯ НАН УКРАЇНИ В СВІТОВИХ НАУКОМЕТРИЧНИХ БАЗАХ

Вступ. Стрімкий розвиток інформаційних технологій та активізація міжнародного співробітництва України з Європою зумовлюють необхідність підвищення конкурентоспроможності України на інформаційному ринку. Головною складовою інформаційного ринку є бази даних, входження до яких сприяє розвитку країни у світовому інформаційному просторі.

Проблематика. Інформаційна діяльність є галуззю суспільного виробництва, що пов'язана з підготовкою та наданням інформаційних послуг і продуктів, покликаних задовольняти певну групу суспільних потреб. Для забезпечення високоякісного наукового простору та конкурентоспроможності, потрібно об'єктивно оцінювати стан наукової періодики України. Наразі актуальною є проблема представлення періодичних видань у світовому інформаційному просторі, зокрема входження їх до загальнодовизначених наукометричних баз даних.

Мета. Визначення актуального стану міжнародного наукового співробітництва в розрізі представлення наукової періодики НАН України у світових наукометричних базах.

Матеріал та методи. Інформаційну основу дослідження склали законодавчі акти, постанови Кабінету Міністрів України та накази Міністерства освіти і науки України, паперові версії журналів НАН України та їхні власні сайти, інформаційний ресурс «Наукова періодика України» Національної бібліотеки України імені В.І. Вернадського, пошукові платформи *Web of Science*, *SCOPUS*, *Google Scholar* (*Google Академія*), бази *Index Copernicus*, *Directory of Open Access Journals (DOAJ)*, *ERIH PLUS*.

Результати. Охарактеризовано входження наукових періодичних видань України до міжнародних реферативних і наукометричних баз даних та їхній актуальний стан.

Висновки. Впровадження інформаційних технологій, входження до баз даних та стимульований ними розвиток журналів відкривають шляхи до нарощування (інтенсифікації) міжнародного наукового співробітництва у науковій царині шляхом ширшого представлення результатів діяльності українських вчених у наукових періодичних виданнях.

Ключові слова: інформаційна діяльність, міжнародне наукове співробітництво, НАН України, наукові періодичні видання, наукометричні бази даних.