

Institute for Biological Research "Siniša Stanković" – Institute of National
Importance for the Republic of Serbia, University of Belgrade

Development Strategy

2023 – 2028

Contents

1. Introduction	1
2. Description of Activities	3
3. Vision and Mission of IBISS	12
3.1 Vision	13
3.2 Mission	13
3.3 Values	13
4. Strategic Areas of Development and Goals	13
4.1 Strategic Areas of Development (Key Strategic Goals)	13
4.2 Specific Strategic Goals	14

1. Introduction

The Institute for Biological Research "Siniša Stanković" – Institute of National Importance for the Republic of Serbia, University of Belgrade (hereafter referred to as IBISS), is adopting the Development Strategy for 2023-2028 to improve its human and infrastructure capacities. By doing so, it aims to strengthen its position among the leading national, regional, European, and global institutes in biological sciences. The recognition of IBISS is based on its outstanding scientific research with a significant international reputation, which will be maintained through the enhancement of research infrastructure, increased participation in higher education to strengthen the national research space, and comprehensive societal development while boosting competitiveness in the region.

IBISS is one of the oldest and largest scientific institutes in the field of biological sciences, both in Serbia and the Western Balkans. In March 2018, the Government of the Republic of Serbia granted IBISS the status of an Institute of National Importance; in December 2021, this status was reaffirmed for the next ten years.

Tradition, teamwork, strong organization, effective internal and external communication, skilled staff, young talent, and dedication to work are the core values of IBISS. International experience and researcher mobility, along with their commitment to applying for and successfully implementing national and international projects, will increase IBISS's visibility by improving all measurable parameters of scientific excellence. IBISS will continue to enhance its human resource infrastructure.

IBISS will be an institution with a well-developed scientific infrastructure, open to all potential users from the scientific and business sectors. It will continue to play a key role in higher education, especially as an institution where master's theses and doctoral dissertations are completed, contributing to the education of professionals equipped to meet society's needs. In collaboration with higher education institutions, IBISS will work on further developing postdoctoral studies. By implementing this Strategy, IBISS will create a stimulating environment for knowledge and technology transfer, fostering increased cooperation with key public enterprises and industry. Responding to the needs of modern society, IBISS will also promote the commercialization of research results, aligning with the growing societal interest in scientific research.

An important aspect of IBISS's activities is the continued effort to raise public awareness about the importance of biological sciences and their impact on the development of modern society. IBISS will remain an active participant in shaping scientific policy and other strategic decisions critical to societal development. This document aims to affirm continuous improvement in basic research excellence, knowledge and technology transfer, education, training, and support for young researchers. This comprehensive approach will allow IBISS to make a significant social impact, advance research in the biological sciences, and strengthen its reputation within the European research community by executing its strategic objectives.

2. Description of Activities

This chapter of the Strategy will outline the main activities of IBISS. Detailed descriptions of specific IBISS activities can be found on the institute's website:

<https://www.ibiss.bg.ac.rs/index.php/sr-rs/>.

The core activity of IBISS is research and development in the natural, technical-technological sciences, and biotechnology. In addition to its primary scientific research efforts, IBISS is also involved in the education of scientific researchers, applied research, knowledge and technology transfer, science promotion, and publishing

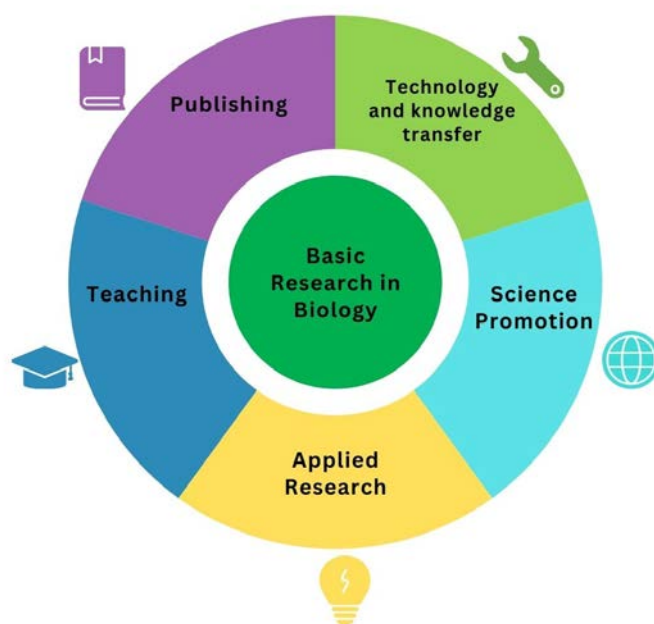


Figure 1. The main activities of IBISS

In 2020, the Institute established the Center of Excellence for Interdisciplinary Biological Research to enhance the quality of scientific research. The center aims to elevate research excellence by fostering stronger collaboration among researchers and optimizing the use of scientific equipment and infrastructure at the Institute.

In May 2021, a proposal was approved to establish a Joint Chinese-Serbian Laboratory, founded by the Shanghai Institute of Materia Medica (SIMM) and IBISS. The establishment of this joint laboratory will serve as the foundation for creating the Center for Biodiversity Protection and Natural Product Research – PANDA. This center aims to enhance the quality of scientific research and increase IBISS's competitiveness

in national and international scientific and professional calls, particularly in the fields of biodiversity protection and the identification of natural products with potential applications in medicine, agriculture, veterinary science, forestry, and more.

IBISS has joined the Serbia Accelerating Innovation and Entrepreneurship Project (SAIGE), which is being implemented through an agreement between the Republic of Serbia and the International Bank for Reconstruction and Development (World Bank). Participation in this project significantly contributes to the commercialization of research results in line with the growing societal interest in scientific research.

The primary activity at IBISS is fundamental research in biology, conducted through long-term, short-term, and annual work plans and programs within national, international, and bilateral projects. Between 2018 and 2022, IBISS carried out 237 projects and programs funded by national and international sources.

The primary results of the work of IBISS researchers are scientific publications. Figure 2 shows the number of publications by IBISS researchers from 2018 to 2022 and the total citations of IBISS from 2012 to 2022, according to the Scopus database. Another key activity of IBISS is the application of results from fundamental research. This area includes applied research projects and the transfer of knowledge and technology in biotechnology, biomedicine, and environmental protection.

The third activity of IBISS is the education of scientific personnel through its involvement in implementing master's, doctoral, and undergraduate academic programs at universities in the Republic of Serbia.

IBISS researchers are involved in the work of numerous expert bodies, committees, and commissions within the Ministry of Science, Technology, and Innovation, the University of Belgrade, and the Community of Institutes of Serbia. They serve as experts on various state-relevant activities and as official representatives of Serbia in international bodies. They also participate in the drafting of legislative acts and state strategic documents related to environmental protection, water use and conservation, and projects requiring specialized expertise, such as environmental impact assessments and evaluations of biological diversity. IBISS researchers are actively engaged in numerous national and international scientific and professional associations and support these organizations' activities.

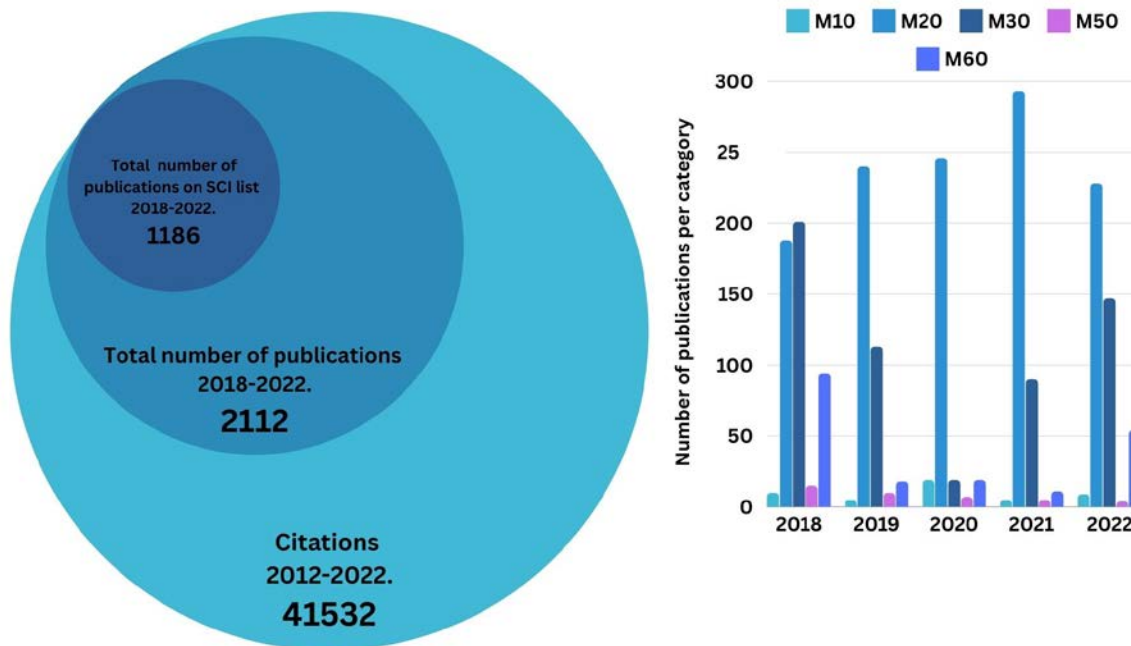


Figure 2. Overview of publications by IBISS researchers from 2018 to 2022, and total citations from 2012 to 2022 according to the Scopus database.

Organizational Structure and Employees at the Institute

The Board of Directors, the Director, and the Assistant Director lead IBISS. The scientific policy of IBISS is formulated by the Scientific Council, which consists of 30 members. Research activities at the Institute are organized into 14 departments, each managed by a department head (Figure 3). The International Advisory Board provides consultative guidance on organizing scientific research.

The research work at IBISS is organized through the activities of 14 departments, overseen by department heads: the Department of Biochemistry, the Department of Molecular Biology, the Department of Cytology, the Department of Physiology, the Department of Plant Physiology, the Department of Insect Physiology and Biochemistry, the Department of Neurobiology, the Department of Neurophysiology, the Department of Immunology, the Department of Genetic Research, the Department of Population Genetics and Ecogenotoxicology, the Department of Ecology, the Department of Hydroecology and Water Protection, and the Department of Evolutionary Biology.

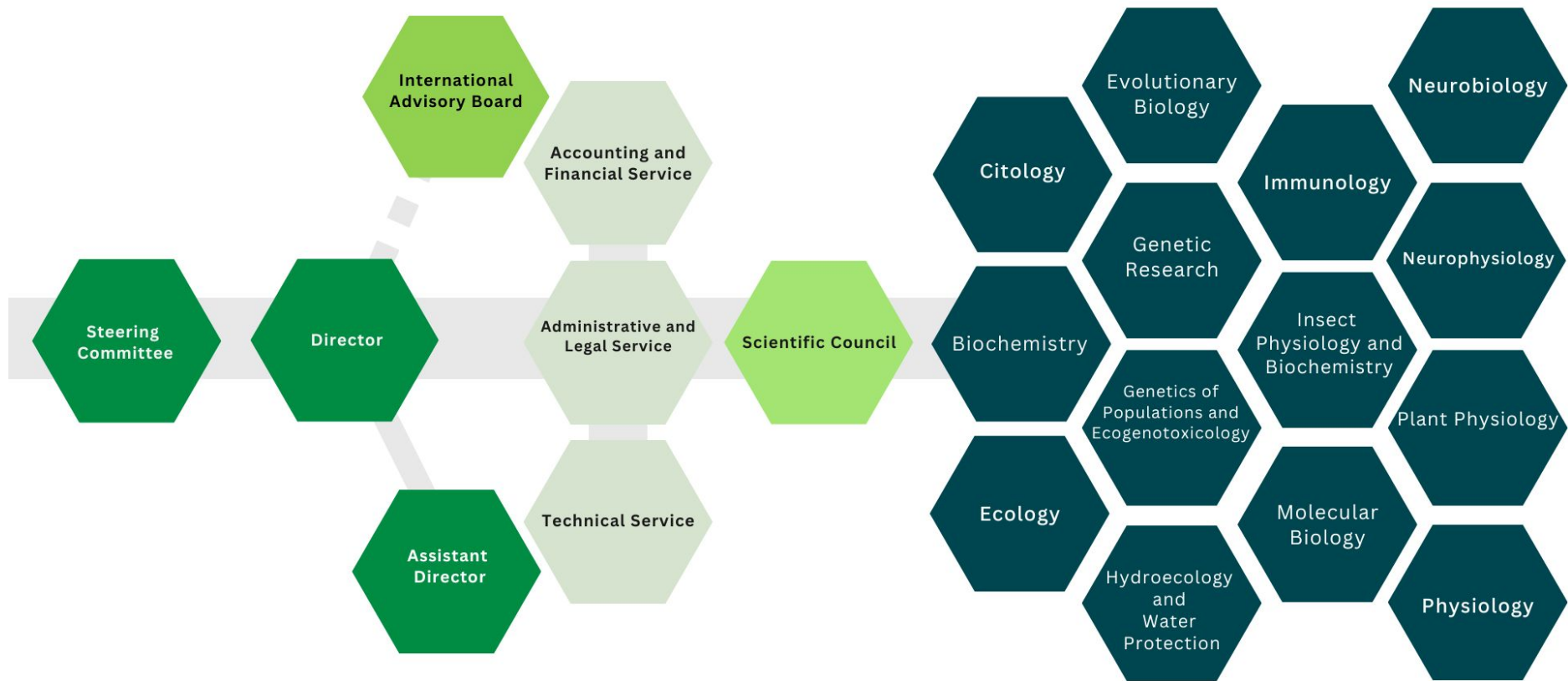


Figure 3. Organizational structure of IBISS.

IBISS Staff

IBISS employs 337 staff members, including 297 researchers: 239 PhD holders and 58 doctoral students. The Administrative-Legal and Technical Services each have 20 employees, totaling 40 staff members.

Young Scientific-Research Talent at IBISS

Since its inception, IBISS has been a hub for developing scientific personnel in biology. A quarter of the research staff consists of young researchers; This highlights the need for IBISS to focus significantly on the ongoing and high-quality education of young talents.

Between 2018 and 2022, IBISS employed 60 young researchers, with 22 hired through public calls for talented young researchers—doctoral students engaged in scientific research within accredited research organizations supported by the relevant Ministry. On average, between 14 and 20 young researchers are engaged annually at the Institute.

Expert services at IBISS

Researchers are supported by three expert services: Administrative-Legal, Accounting-Financial, and Technical Services, which together employ 40 staff members.

IBISS Finances

Figure 4 presents the revenue structure of IBISS from 2018 to the end of 2022. Most of the revenue is sourced from the Budget of the Republic of Serbia (via funding from the relevant ministry), followed by contributions from the Science Fund. Additional revenue is generated through international project implementation and services offered to industry partners.

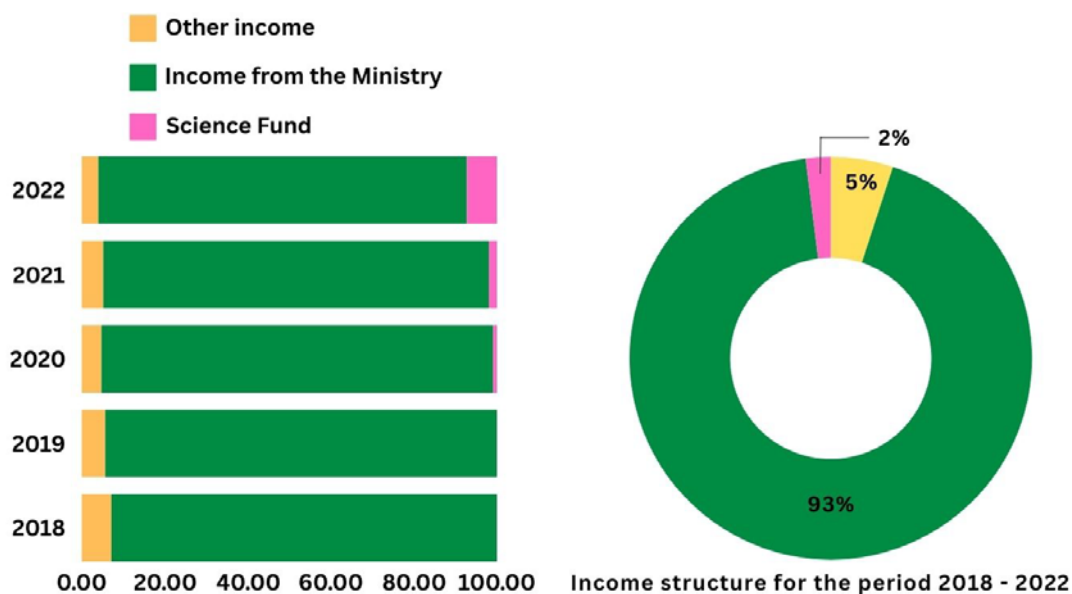


Figure 4. Revenue structure of IBISS for the period 2018-2022

Publications, Programs, and Projects of IBISS

The success of IBISS since its founding is demonstrated by the successful completion of over 400 projects funded by national programs and fundamental research programs, 300 international projects, and numerous collaborative projects with government institutions, public enterprises, and industry. IBISS researchers have published results in over 15,000 scientific publications in renowned international journals.

Between 2018 and 2022, a total of 2,112 bibliographic units were published. This includes 1,186 scientific papers in journals listed on the SCI index (183 in category M21a, 506 in category M21, 293 in category M22, and 204 in category M23) and 48 publications in category M10 (see Figures 5 and 6).

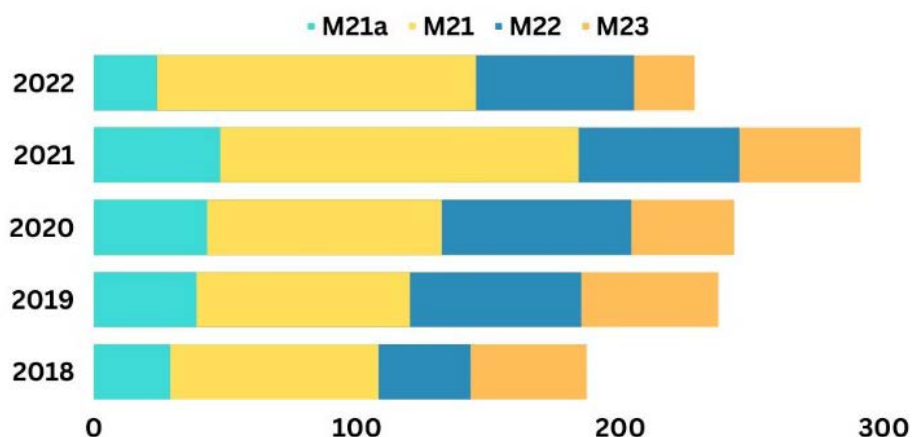


Figure 5. Overview of publications by IBISS researchers for the period 2018-2022: Categories M21a, M21, M22, and M23.

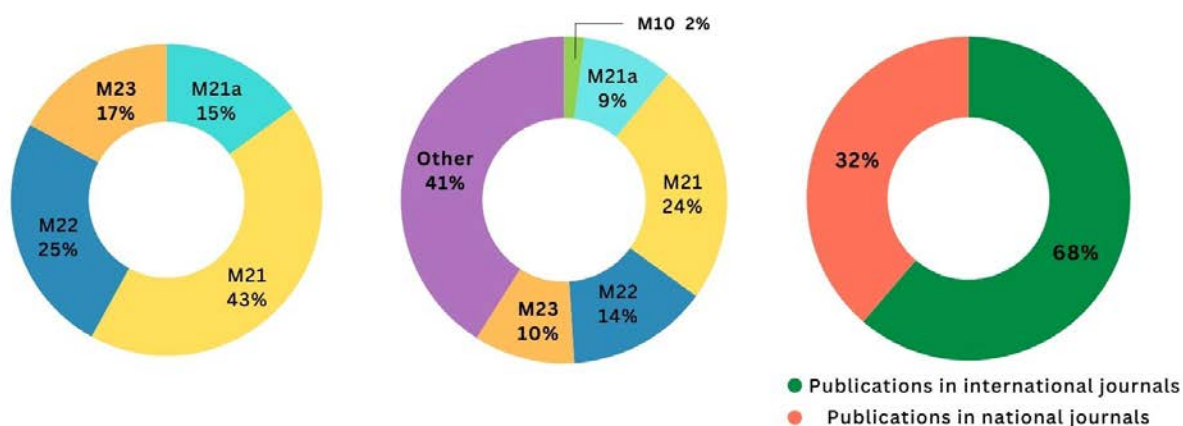


Figure 6. Overview of publications by IBISS researchers for the period 2018-2022: Categories M10, M21a, M21, M22, M23, and other categories from M24 to M70.

International agreements have been executed through the following programs and calls:

- European Commission calls: FP7, Horizon 2020, Horizon Europe, ERA.Net RUS plus
- EFSD – "European Foundation for the Study of Diabetes"
- Programs of the Fogarty International Center at the U.S. National Institutes of Health
- Iacocca Family Foundation program
- SCOPES Grant Programme for Joint Research Projects
- World Bank program projects
- Collaborations with foreign institutes and universities based on cooperation agreements

- Programs funded under the Danube Strategy
- Inter-university exchange programs "ERASMUS+"
- Alexander von Humboldt Foundation

IBISS also collaborates with businesses. In the past five years, projects have been completed with 26 companies registered in Serbia, 10 public enterprises, numerous healthcare institutions, and legal entities from abroad.

Applied Projects and Technology Transfer

In ecology, hydrobiology, genetic research, ecogenotoxicology, plant physiology, insect physiology and biochemistry, and evolutionary biology, fundamental biological knowledge can address various environmental and biodiversity conservation issues at national and regional levels.

These activities in the fields of environmental science, biotechnology, and biomedicine involve specialized data analysis and measurement services:

- The human and infrastructural potential of IBISS enables the execution of expert and routine analyses for assessing the biological activity of various compounds; developing diagnostic and therapeutic procedures for potential clinical practice; evaluating the genotoxicity of a wide range of chemical, pharmaceutical, and food products; analyzing environmental quality; and other specific high-level expert services. Additionally, IBISS staff organize training for personnel from other institutions through various courses, seminars, and lectures.

The potential for scientific research at IBISS to drive innovation and technology transfer is substantial.

Collaboration with Higher Education Institutions and Educational Activities

Over 50 IBISS staff members are actively involved in doctoral studies primarily at the University of Belgrade and at the universities in Niš, Novi Sad, Kragujevac, and Novi Pazar. IBISS, in collaboration with the Faculty of Biology and the Institute of Molecular Genetics and Genetic Engineering at the University of Belgrade, administers the Molecular Biology doctoral program.

In addition to the University of Belgrade, IBISS staff participate in doctoral studies at the Faculty of Medicine and the Faculty of Forestry at the University of Belgrade. IBISS staff also teach at doctoral degree programs of the Institute of Biology and Ecology at the Faculty of Science, University of Kragujevac; the Department of Biology and Ecology, Faculty of Science, University of Novi Sad; the Department of Biology at the Faculty of Science, University of Niš; and the Department of Biomedical Sciences at the University of Novi Pazar. One IBISS staff member also participates in undergraduate studies at the Faculty of Agriculture and the Faculty of Pharmacy at the University of Bijeljina, Republika Srpska.

Between 2018 and 2022, 57 young IBISS staff members defended their doctoral dissertations (53 under the mentorship of IBISS staff). During the same period, IBISS staff were involved in 16 doctoral dissertations and are currently mentoring 18 more, with three doctoral candidates from foreign institutions. In the same period, 59 master's theses were completed under the mentorship of IBISS staff.

The Institute places special emphasis on the education of its young researchers and those from other research institutions in Serbia. The Institute has a long history of successful collaboration with institutes and faculties nationally and internationally.

Library Services of IBISS

The IBISS library is a specialized library within scientific research institutes and institutions. It is registered in the Central Library Registry of Serbia managed by the University Library "Svetozar Marković," under registration number 06-218/195, dated November 14, 1997, with identification number 3018407067. The library offers 30 research workstations, three desktop computers, a printer, and a projector for presentations. The library's collection is open access following the regulations on library material storage. It is included in the national library information system COBISS.SR and, by extension, the international COBISS net network. The library holds over 32,000 bibliographic units, including domestic and international journals and books. Since joining the Consortium of Serbian Libraries for Unified Procurement (KoBSON) in 2002 as part of the Academic Network of the University of Belgrade, the Institute has adapted its procurement policy for scientific literature. Through KoBSON, IBISS researchers have access to over 35,000 full-text foreign scientific journals, nearly 160,000 book titles, and several index databases.

Publishing Activities of IBISS

Since its establishment, IBISS has developed a publishing activity for monographic and serial publications. IBISS co-publishes international scientific journals such as Archives of Biological Sciences (founded in 1949), Water Research and Management (founded in 2011), and Acta Entomologica Serbica (founded in 1926). Additionally, the Institute co-publishes the biology popularization journal "Contemporary Biology" for school-age children. IBISS has a long-standing successful collaboration with institutes and faculties both domestically and internationally, as well as with many business entities.

Information System of IBISS

IBISS is part of the Academic Network of Serbia and receives support from the Computing Center of the University of Belgrade. Resources provided through this collaboration include internet connectivity, website hosting, and email server services. In collaboration with the Computing Center

of the University of Belgrade, an institutional repository with software for tracking research results – RADAAR – has been established, the first of its kind in Serbia. The Institute has secured data storage space with network and external client access (CLOUD).

Dissemination, Promotion, and Popularization of Results

IBISS has always recognized the importance of science promotion, with researchers participating in various outreach activities over the years. The well-known "Science Festival" was realized thanks to the enthusiasm of IBISS staff. Additionally, IBISS staff have participated in the "Researchers' Night," a large-scale event highlighting researchers and science. This event, supported by the European Commission's Marie Skłodowska-Curie Actions, was held virtually in 2020 due to the epidemiological situation. In September 2022, IBISS, the Center for the Promotion of Science, and other research institutions organized the "Researchers' Night" as part of the European Researchers' Night project.

IBISS staff are also active throughout the year, organizing school visits to present various scientific topics and accommodating requests from primary and secondary schools. They gladly host groups of students and actively participate in the Petnica Science Center and Regional Talent Centers as lecturers, mentors, or organizers of various trainings and courses.

Awards and Recognitions

The long-standing successful work of IBISS staff has been recognized through various awards and honors received over more than seven decades. These include the Order of the Republic with Golden Wreath, several Orders of Merit for the People with Silver Rays, the Order of Labor with the Red Flag, multiple July 7th and October Awards of the City of Belgrade, the Matica Srpska Charter, the Ministry of Science and Technological Development of Serbia's second prize for Best Technological Innovation, several L'Oréal-UNESCO Awards for Women in Science, the UN gold medals, and the WIPO (World Intellectual Property Organization) diploma, among others. The Institute was awarded the Order of the Serbian Flag of the Third Class for outstanding contributions to the development of biological science and practice in Serbia, and a charter from the University of Belgrade for special contributions to the development and improvement of the University. In 2018, the Serbian Government granted IBISS the status of an institute of national importance. IBISS staff actively participated in organizing and running laboratories for detecting SARS-CoV-2 during 2020 and 2021 and contributed to collecting and analyzing scientific knowledge about the virus mechanism. For these activities, IBISS received a commendation from the Serbian Government for contributing to the fight against the COVID-19 pandemic.

3. Vision and Mission of IBISS

3.1 Vision

To be a leading international institution recognized for scientific excellence, contributing to societal development at both national and global levels through outstanding basic research in biology and the transfer of knowledge and technology.

3.2 Mission

The mission of IBISS is to tackle societal challenges and support national development goals through ongoing scientific research in biology and related disciplines. This involves enhancing scientific work conditions, improving researcher skills, and advancing higher education, positioning IBISS as a leading institution in biology in the Balkans.

3.3 Values

IBISS upholds the values of high-quality scientific research, relevance, and ethics. The established value system in scientific research will be maintained and committed to open science principles and the highest academic standards. IBISS continually enhances its research processes while emphasizing knowledge development and skill acquisition, ensuring that human resources are well-prepared to tackle societal challenges. IBISS's staff work tirelessly to foster collaboration with the public and private sectors to gain feedback for improving the research process and diversifying revenue sources. Researchers at IBISS adhere to the highest standards of interdisciplinarity and multidisciplinarity to advance the development of knowledge and technologies. For decades, IBISS has been active in the international scientific research arena, participating in numerous international project activities and supporting continuous professional development and mobility of researchers, which are the foundations of research excellence and global visibility. IBISS is committed to modernizing and optimizing its infrastructure and equipment, revitalizing its human resources policy, and improving conditions for scientific research to remain an effective, diverse, and creative research center where people are the most important resource.

4. Strategic Areas of Development and Goals

4.1 Strategic Areas of Development (Key Strategic Goals)

IBISS has identified its strategic areas of development from 2024 to 2028, considering the Serbian Strategy for Scientific and Technological Development "The Power of Knowledge" for 2021-2025, and the specifics of its operational fields, internal structure, and working methods within the Institute. Accordingly, four key strategic goals have been identified:

1. Enhanced Excellence in Basic Research
2. Improved Knowledge and Technology Transfer
3. Increased Participation in Higher Education
4. Increased Social Relevance

4.2 Specific Strategic Goals

4.2.1 Strategic Goal 1: Enhanced Excellence in Basic Research

- **Specific Goal 1.1:** Increase the total number and quality of scientific publications in international journals listed on the SCI.
- **Specific Goal 1.2:** Increase the number of scientific project applications for international grants.
- **Specific Goal 1.3:** Maintain continuity in the number of project applications to the Serbian Science Fund.
- **Specific Goal 1.4:** Sustain and establish new strategic collaborations with renowned international research institutions.
- **Specific Goal 1.5:** Enhance capacity in bioinformatics.
- **Specific Goal 1.6:** Ensure continuity in researcher employment.
- **Specific Goal 1.7:** Maintain continuity in publishing activities.

4.2.2 Strategic Goal 2: Improved Knowledge and Technology Transfer

- **Specific Goal 2.1:** Increase the number of project applications to the Serbian Innovation Fund, and projects/services with institutions from the private and public sectors.
- **Specific Goal 2.2:** Increase the number of patent applications.

4.2.3 Strategic Goal 3: Increased Participation in Higher Education

- **Specific Goal 3.1:** Intensify collaboration with higher education institutions.
- **Specific Goal 3.2:** Develop doctoral study programs in collaboration with higher education institutions.

4.2.4 Strategic Goal 4: Increased Social Relevance

- **Specific Goal 4.1:** Enhance IBISS's contribution to science popularization.