BIENNIAL REPORT

2020/21

NATIONAL HELLENIC RESEARCH FOUNDATION

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CHAIRMAN'S MESSAGE

For the last two years, we have been dealing with one of the greatest public health emergencies while still addressing challenges caused by the Covid-19 pandemic.

At National Hellenic Research Foundation (NHRF), our pivot has been to embrace disruption constructively and restore our productivity by converting this condition into a unique opportunity to reimagine and redefine the way we work.

Maintaining our morale and potential, we immediately adjusted our operation to the new era and we are now confident that we managed to preserve and augment our input to the research and innovation ecosystem. That unhampered advancement of NHRF is based on the pillars of our solid strategy that focuses on tackling the major challenges of our times through cutting-edge and interdisciplinary research, lab-to-market culture, and the ongoing investment in innovative technologies.

As one of the largest research centers in Greece, we are committed to serving Science and Research while responding to the pressing needs of society, economy, and industry. The forefront of research conducted at NHRF's laboratories extends over a wide spectrum of fields combining both Natural Sciences and Humanities, a coexistence that makes us feel proud of contributing on such a large scale. Our allies in this effort are the talented and dedicated researchers who are privileged to work in high-end research infrastructures that urge them to go the extra mile while remaining to serve research in our country. The new generation of scientists incubated at NHRF is constant proof that we staff Research with excellent scientists and this constitutes the most important investment in the future of Greece.

The ecosystem is changing rapidly worldwide, and the research community should keep leading the way.

That is NHRF's mission for the years to come.

Dr. Vasilis Gregoriou
NHRF Director & Chairman of the Board


Η ΕΙΚΟΝΑ
ΕΠΙΣΤΗΜΟΝΑ
ΕΘΝΙΚΟΝ ΙΔΡΥΜΑ ΕΡΕΥΝΩΝ

1. INSTITUTES' ACTIVITIES OVERVIEW

1.1 Institute of Historical Research — IHR/NHRF

IHR/NHRF is committed to studying and documenting the political, economic, social, and cultural history of Greece, as well as the wider geographical territory where Hellenism has been active from ancient to modern times, and to applying synthetic approaches through interdisciplinary collaborations. Research is conducted by encouraging innovation, and promoting interdisciplinarity while instilling honesty, fairness, and equity in interpersonal, professional, and academic relationships and projects.

The aim is to further promote in several substantive ways the national self-awareness in the areas under study through the production of methodologically advanced historical knowledge and its dissemination to the public. Within this scope, IHR/NHRF played a key role in the bicentennial commemoration of the Greek Revolution through various outputs, including a new dedicated publication series that expanded the Institute's collaborative potential both in Greece and abroad.

The main dissemination channel of the work produced is the IHR's publications, which during the biennium amounted to a total of 17 books, not counting the Institute's journals. The publications include the publication of primary sources, monographs, collective volumes, and conference proceedings.

Furthermore, IHR runs three internationally acclaimed blind peer-reviewed and open-access online journals;

- "The Historical Review/La Revue Historique", an annual refereed journal of historical research in the human sciences
- "Byzantina Symmeikta" which publishes original research in the field of Byzantine and post-byzantine studies, with emphasis on interdisciplinary approaches
- and "Tekmeria" which publishes articles about the study of the ancient world, with particular emphasis on Ancient Greek history, Epigraphy, Numismatics, Topography and Historical Geography; it also emphasizes on the publication, republication or exploitation of epigraphic and numismatic materials, while providing a medium of dialogue and reflection in the broad field of historical study in the Humanities.

The journal volumes published were 6 in total.

Books
→ 2020/21

17

Total Journal Volumes

6

The prolific publishing activity of the Institute can be sought and supplied in the physical IHR Bookstore at NHRF premises, the digital bookstore of IHR/NHRF as well as in large bookstores in Athens.

IHR/NHRF possesses a specialized library that comprises approximately 50,000 titles and provides open-access facilities to many international online academic journals. The Institute also hosts a large number of primary and secondary-source research databases, many of which can be accessed online by everyone, while archives and other primary sources in IHR collections are research-only and accessible by researchers upon request.

IHR comprises three (3) main Sections, and an inter-sectional Research Group 2016-2021:

Section of Neohellenic Research — SNR
The Section of Neohellenic Research was founded in 1960 as the Center for Neohellenic Research having as its primary objective the study and documenting modern Hellenism, modern Greek literature, and history from the fifteenth to the nineteenth centuries, but also the establishment of modern Greek studies as an autonomous field in Greece and abroad. SNR's initial objective was to conduct census work and develop research tools (i.e. indexes and catalogs of private libraries, school libraries, and archives, as well as the development of bibliographies on contemporary Greece). Since then, novel approaches have been widely adopted and enhanced within this Sector.

Section of Byzantine Research — SBR
The Section of Byzantine Research, established in 1960 as the Center for Byzantine Research aims to carry out studies on Byzantine history and civilization, as well as to examine the Byzantine Empire's relations with medieval Europe, the Balkans, and the Eastern Mediterranean region through literary and archival sources, archaeological monuments, and works of art. The SBR is structured in four Research Areas, within which programs and projects are implemented by its Researchers and Functional Scientific Personnel.

Section of Greek & Roman Antiquity — SGRA
The Section of Greek and Roman Antiquity is dedicated to producing and disseminating original and high-quality research on the history of the Greek world from antiquity to late antiquity, as well as on Hellenism's relations and interactions with neighboring populations and cultures. Since its inception as an autonomous Institute in 1979, the SGRA has focused its academic efforts on researching, developing, and enhancing the study of fields of knowledge that previously were drawing little attention from the Greek academic institutions.

Anavathmis Collective Research Project
Anavathmis Research Group was founded in 2016 and completed its course in 2021. It focused on the broad field of digital humanities, exploring the intersections between historical research and digital humanities through the adoption and incorporation of emerging digital methods and innovative tools for conducting and disseminating primary and applied historical research in dynamic ways. Anavathmis Group has integrated digital archives and applications, analytics, and geospatial visualization into its research and dissemination activities. As a collective project, it drew together 41 IHR researchers, 37 recruited experts, post-doctoral scientists, Ph.D. candidates and postgraduate students, historians, information technology and web design experts, digital app developers, and a variety of experts in digital humanities, historical cartography, GIS, photography, and book editing. The Anavathmis Program was funded by Greece and the European Union through the Operational Program "Competitiveness, Entrepreneurship, and Innovation" (NSRF 2014-2020 - European Regional Development Fund).

1.2 Institute of Chemical Biology — ICB/NHRF

ICB/NHRF endorses a research approach at the interface of Chemistry and Biology, to resolve cutting-edge issues in health, drug discovery, and biotechnology, acting as the only pole of innovation at a national level, taking into account that no other Institute in Greece currently employs an analogous integrated multidisciplinary approach to disease prevention and treatment, combining state-of-the-art biological research (biological target identification, biological evaluation of bioactive agents, biomarker discovery) with synthetic and medicinal chemistry and molecular analysis (rational design and synthesis of bioactive compounds – potential drugs).

The fruitful synergistic and complementary interactions of ICB/NHRF researchers and the exploitation of its research infrastructures ensure advances in both translational and basic research. ICB/NHRF participates in Calls promoting the national research priorities "Biomedicine & health", "Agro-Biotechnology & Food", and "Energy & Environment" in the framework of Research and Technology Innovation Strategies for Smart Specialization (RIS3).

The key objective of ICB/NHRF is to act as a focal point of Excellence in Chemical Biology through an interdisciplinary approach. ICB/NHRF aspires to play a key role, nationally and internationally, in research for drug discovery and biological target identification, for holistic biomarkers of health and disease as well as in research on high added-value fine chemicals, biotech products, and processes. Furthermore, the Institute aims at promoting research, education, and innovation capitalizing on the scientific expertise of its research staff and the state-of-the-art infrastructure for the benefit of science and society.

The individual Excellence objectives of ICB/NHRF include:

- Discovery and development of targeted bioactive compounds, smart probes, and theranostics for disease prevention, treatment, and diagnosis
- Identification and validation of disease-and drug-related biomarkers using modern holistic approaches
- Basic research to unravel the molecular mechanisms involved in physiological and pathological conditions
- (Nano) Biotechnology, Synthetic Biology, and Green Chemistry for the production of high added-value products with applications in food, nutraceuticals, pharmaceuticals, cosmetics, and chemicals
- Promotion of translational research through closer collaboration with clinical scientists
- Consolidation of its activities related to the education of young scientists and promotion of the diffusion of scientific knowledge to society
- Strengthening of partnerships with the private sector, transfer of know-how, and provision of specialized research services to the public and private sectors
- Exploitation of research results through patents and creation of spin-off and start-up companies

ICB/NHRF is a unique pole of innovation in Greece, when it comes to issues related to health, drug discovery, and biotechnology.

ICB personnel is distributed in the following research activities:

Drug Discovery	Molecular Analysis Organic and Organometallic Chemistry Medicinal Chemistry Synthetic Medicinal Chemistry of Bioactive Targeted Molecules Identification & validation of novel therapeutic targets - Biological evaluation of bioactive small molecules and drugs Structural Biology & Chemistry Molecular Endocrinology Signal Mediated Gene Expression Molecular & Cellular Ageing Biomedical Applications Holistic approaches to Health
Environment and Health	Metabolic Engineering - Bioinformatics Biomarker Discovery & Translational Research
Biotechnology	Enzyme and Synthetic Biotechnology Biomimetics & Nanobiotechnology Conjugated Polymers for Healthcare, Bioelectronics and Bioimaging

1.3 Theoretical & Physical Chemistry Institute — TPCI/NHRF

TPCI/NHRF develops and advances scientific knowledge and technological innovation of advanced materials with functionality in selected fields at the forefront of synthetic and physical chemistry, theoretical and computational chemistry and materials science, and photonics. To facilitate this long-term strategy, TPCI/NHRF organizes its research activities in the following directions:

Theoretical and Computational Chemistry and Materials Science:
focuses on the development and application of advanced modeling methodologies to improve the fundamental understanding of molecules, nanostructures, and materials, leading to the *in-silico* prediction of their structure and properties. The latter can be subsequently tested in the lab and exploited in practical applications. Thematic priorities within this research direction are:

1.3.1 Properties and processes in molecular systems and advanced nanomaterials
1.3.2 Photochemistry in complex molecular systems and nanostructured materials
1.3.3 Supramolecular chemistry in confined space and organized assemblies
1.3.4 Adsorption and diffusion in nanoporous materials
1.3.5 Advanced theoretical and computational methods

Materials Synthesis and Physical Chemistry:
Engaged in the design and synthesis of new nanostructured materials with advanced functionality, physicochemical characterization, and properties assessment, mainly for (photo)electrocatalytic hydrogen production, (photo)electrochemical cells, cancer and gene therapy, functional surfaces, (bio)sensing, and environmental remediation. Thematic priorities within this research direction are :

1.3.6 Carbon nanostructures and two-dimensional nanomaterials
1.3.7 Macromolecular materials and nanostructures
1.3.8 Nanostructured amorphous materials with advanced functionality
1.3.9 Complex and hybrid nanomaterials
1.3.10 Laser structuring and functionalization of materials and devices

Photonics for Nano-applications:
The interest focuses on the fundamental aspects of light and electromagnetic field (EMF) interactions with matter and biological systems and photonic devices, considered both theoretically and experimentally. Thematic priorities within this research direction are:

1.3.11 Size-dependent phenomena and complexity at the nanoscale
1.3.12 Biophotonics, biophysics, and space science applications
1.3.13 Optical fiber devices and sensors
1.3.14 Applied photonics in industrial, biomedical, and quantum applications

With a solid long-term scientific strategy and significant expertise developed over the years, TPCI/NHRF remains alert in redirecting its research toward emerging cutting-edge topics, strengthening its competitiveness via external funding, and seeking the industrial exploitation of its know-how. The research groups of the Institute contribute substantially to the advancement of scientific knowledge and technological innovation. The collaboration of the Institute's research activities achieves proof-of-concept for selected and targeted applications, the development of prototype devices, and the scaling up and application of technologies developed to bridge the gap between laboratory research, the private sector, and society.

The infrastructures of TPCI/NHRF include specialized laboratories for synthesis, structural and spectroscopic characterization of advanced materials with designed functionality, platforms for the evaluation and assessment of optical, electrochemical, and thermal properties, clean rooms for photonics and nano-applications, as well as a computer facility fully equipped with up-to-date software for materials properties' calculations.

TPCI/NHRF has the oldest and largest theoretical/computational materials science and physical chemistry team in the country, working jointly with the experimentalists in the Institute and other research groups in the country and abroad. In addition, the expertise at TPCI/NHRF in the design, synthesis, and development of nanostructured materials, precisely nanocarbon-based, macromolecular, and low-dimensional materials, relevant to energy-related applications, optical and electrochemical sensing, nanomedicine, diagnostics, electro-optics, and photonics, is unique in Greece.

The expertise at TPCI/NHRF in the design, synthesis, and development of nanostructured materials, especially, nanocarbon-based, macromolecular, and low-dimensional materials is distinct in Greece.

2. RESEARCH PUBLICATIONS

Institute of Historical Research — IHR/NHRF

Journal Publications	International Conference Proceedings	Other Conferences
73	23	20
Book Chapters	**Books – Monographs**	**New Titles - (IHR publications)**
73	43	17

[1] See A. Nederhof, "Bibliometric monitoring of research performance in the Social Sciences and the Humanities: A Review", Scientometrics 66 (2006) 81-100 [https://doi.org/10.1007/s11192-006-0007-2], with earlier literature; cf. most recently G. Colavizza, S. Peroni, M. Romanello, "The case for the Humanities Citation Index (HuCI): a citation index by the humanities, for the humanities", arXiv preprint arXiv:2110.00307 (2021) [https://arxiv.org/abs/2110.00307, accessed 11/1/2022], with further literature and proposals for the establishment of a proper Humanities citation index in the future.

[2] See E. Kulczycki et al., "Publication patterns in the social sciences and humanities: evidence from eight European countries", Scientometrics 116 (2018) 463-486 [https://doi.org/10.1007/s11192-018-2711-0] 474, t.6.

Institutes total citations: ≥20.508*

*Citation indexing in Humanities offers a very limited picture of a scholar's output and impact, especially for languages other than English. The reasons have been enumerated repeatedly [1,2]

Institute of Chemical Biology — ICB/NHRF

Journal Publications

156

International Conference Proceedings

6

Other Conferences

108

Book Chapters

6

Theoretical & Physical Chemistry Institute — TPCI/NHRF

Journal Publications

162

International Conference Proceedings

6

Other Conferences

129

Book Chapters

10

Book

1

3. NHRF AS A KEY PLAYER IN THE INNOVATION AND SUSTAINABLE DEVELOPMENT ECOSYSTEM

NHRF has become a key player at both national and international levels in the development of new scientific knowledge. Its dual scientific identity based on the successful coexistence of Humanities and Natural Sciences Institutes provides a unique advantage and achievement in Greece while increasing NHRF's competitiveness abroad.

The Institute of Historical Research (IHR/NHRF) is one of the most important places for the study of Greek archaeology and history (ancient, medieval, and modern) worldwide and, at the same time, a unique infrastructure of national importance. The two Institutes of the Natural Sciences (i.e. ICB/NHRF and TPCI/NHRF) have excelled in their fields of study while optimizing the capacity for synergies due to their spatial and scientific proximity within the context of the NHRF's strategy.

3.1 Innovation for NHRF

Linking research to market and society

Innovation management, promotion of collaboration, and provision of services towards industry, enterprises, and the wider public sector, constitute a fundamental goal for the development of NHRF achieved through the following strategic priorities:

- Focusing on fields that lie at the forefront of science, especially on nano-materials, medicine, environment, health, photonics, and biotechnology applications as well as on innovative technological applications in the broader field of historical sciences and culture
- Adopting policies to attract and develop human resources
- Enhancing openness and closer partnerships through program agreements with private and public entities, with emphasis on the areas of health, environment, culture, and Greek scientific digital content
- Modernizing and expanding infrastructures for Research Institutes and Libraries for further development in e-content, repositories, and digital reading rooms
- Strengthening the competitiveness of the Foundation and the ability to ensure financing, especially from the EU and International Organizations
- Supporting researchers in their collaboration with other research institutes or industry/enterprises
- Enhancing actions for intellectual property, inventions, entrepreneurship, technology transfer, etc.
- Mapping the services and products provided by NHRF and identification of potential users
- Promoting research and overall activities of NHRF to the general public as well as other research organizations in Greece and Europe.

Technology Transfer

Intending to create a new support structure for technology transfer, NHRF secured funding from EPAnEK to develop the necessary framework for the operation of a Technology Transfer Office within. Through this new structure, the NHRF research community will find help in the effort to transfer the knowledge it produces in cutting-edge fields to businesses and society.

At the same time, NHRF cooperates in the project "Support Network for Highlighting and Promoting Research Innovation of Insular Greece", which is also funded by EPANEK. In the context of this project, NHRF will cooperate with institutions that have already developed Technology Transfer Offices (ITE, University of the Aegean, University of Crete, Technical University of Crete) as well as other institutions that are also at an early stage in terms of the organization and operation of effective Technology Transfer structures (such as the Hellenic Mediterranean University, the Ionian University, the University of West Attica, the BSRC "Al. Fleming" and the Hellenic Pasteur Institute), in order to achieve the necessary networking and exchange of know-how and tools in matters concerning the utilization of mature research results and funding attracting for the development of innovative applications and products.

Entrepreneurship: NHRF's spin-off and start-up companies

Bio-informatics

e-NIOS Applications IKE (e-Noesis Inspired Operational Systems) is a bioinformatics spin-off company of ICB/NHRF founded by the members of the Metabolic Engineering and Bioinformatics Programme Dr. Aristotelis Chatziioannou, Dr. Eleftherios Pilalis, and Dr. Ioannis Valavanis. The company's expertise is based on its team's interdisciplinary research experience in the fields of bioinformatics, genomics, computational intelligence, data mining, and decision support systems.

The company's primary mission is to accelerate research and innovation in health and especially in the cutting-edge field of Precision Medicine, through the development of computational methodologies and cloud software for the integrative analysis of multi-omic data, derived from high-throughput sequencing technologies (DNA/RNA-seq). The company's computational platform addresses the need for efficient, automated analysis and interpretation of complex genomic data, to detect critical molecular factors as diagnostic biomarkers and therapeutic targets.

Biotechnology

ResQ Biotech is also a spin-off company of ICB/NHRF established in 2019 by Dr. G. Skretas at Patras Science Park. It is a platform technology/drug discovery company targeting diseases caused by problematic protein folding and aggregation (Alzheimer's disease, amyotrophic lateral sclerosis, cancer, systemic amyloidosis, etc.). Its proprietary biotechnological approach uses genetically engineered E.coli bacteria to biosynthesize billions of cyclic oligopeptides, an emerging class of therapeutic molecules, and simultaneously screen them to identify inhibitors of pathogenic protein misfolding and aggregation. ResQBiotech aspires to become a partner of choice for every Pharma & Biotech company that is developing drugs for protein misfolding diseases and looking for new assets to expand their pipelines. It is currently raising its Seed Round of funding.

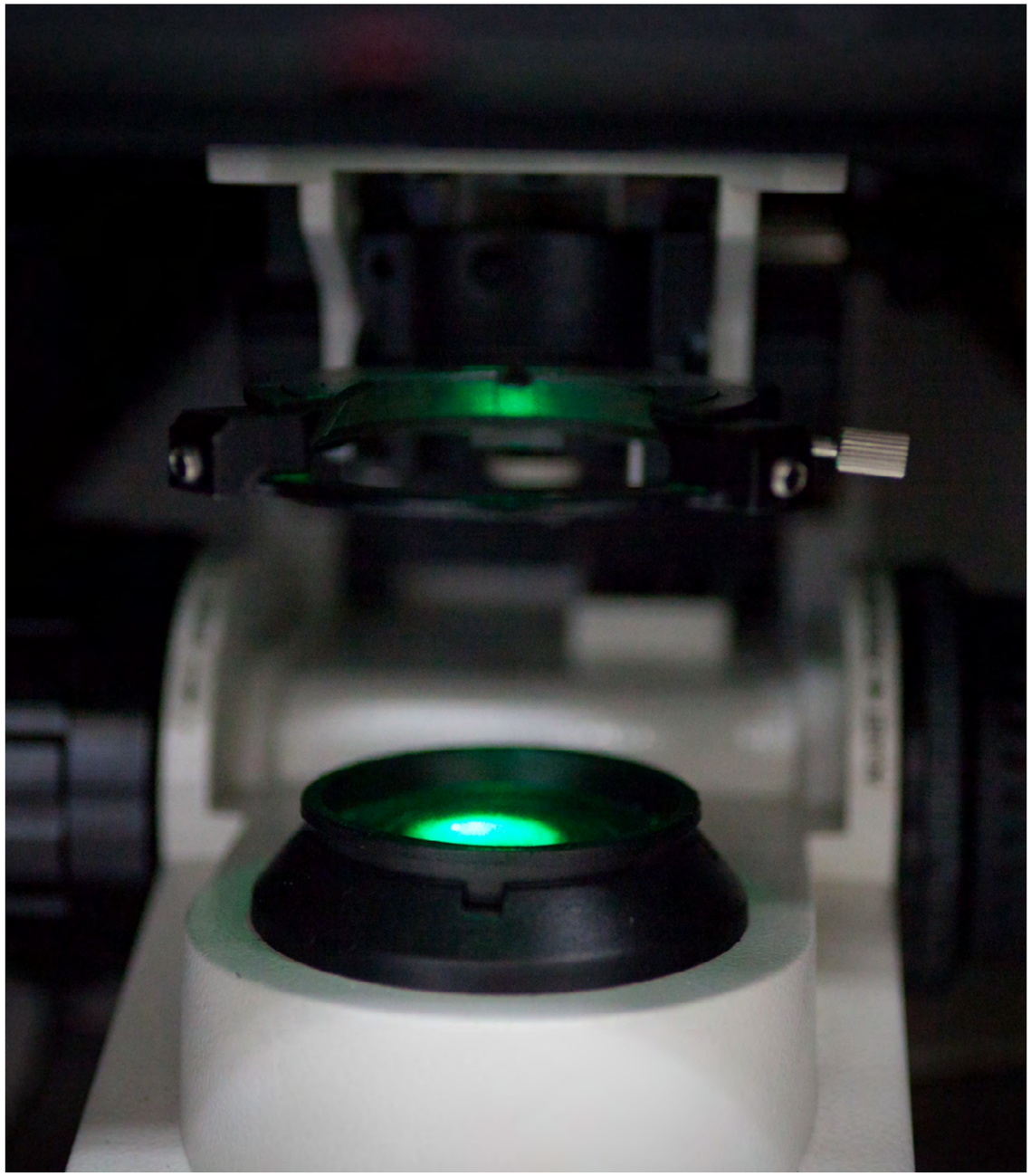
Theranostics and bioelectronic applications

ACE (Advanced Cure Electronic) was founded in 2019 with the aim of discovery, preclinical development, and commercial exploitation of conjugated polymeric nanoparticles with therapeutic properties against various forms of cancer as well as new conductive polymers for bioelectronic applications.

This is achieved mainly through the research, development, and utilization of innovative methods, technologies, and tools, produced by the research team of the laboratory of Dr. Vasilis Gregoriou and Dr. Christos Chochos (ICB/NHRF) at NHRF.

New Drugs

QuadrEL Srl, based in Modena, Italy, is a start-up company founded in 2020 with the aim of research, development, production, and marketing in the field of pharmaceuticals, veterinary medicines, innovative medicines, and biotechnology. QuadrEL focuses mainly on infectious diseases. Dr. Th. Kalogeropoulou (Director of Research, ICB/NHRF) is the co-founder of the company.



3.2 Sustainable Development for NHRF

The nonprofit sector has traditionally been intertwined with ESG values (Environmental, Social, Governance). Organizations supporting practices and sustainable development policies have the opportunity to benefit from ESG policies as recipients of funding and sponsorships, while at the same time the industry seeks to align with relevant social goals and reliable ESG-oriented partners. Although knowledge centers do not change overnight, research centers around the world are already beginning to realize the importance of ESG practices by redefining their function in the new innovation landscape.

The Environment, Society, and Corporate Governance are not approached individually or separately from the NHRF's ethos. On the contrary, it is a clear priority of the Foundation to enhance the integration of the three dimensions in its operation directly related to its mission and individual goals.

Low environmental footprint

At NHRF, we work on keeping our environmental footprint low by always adopting best practices in our research activities. Indicatively, the current practices on the field include:

- use of materials with the highest possible efficiency and the lowest possible waste disposal
- recycling of paper and plastic
- selection of laboratory chemicals with the lowest possible emissions
- energy upgrade of the NHRF building with the concurrent aim of partial autonomy, through Renewable Energy Sources' exploitation.

The energy and environmental upgrade of the NHRF's building complex will be part of a major funded project that has received preliminary approval from the Recovery and Resilience Facility (RRF), through the General Secretariat for Research and Innovation (GSRI), and it aims to the creation of a new Center of Excellence at NHRF focusing on the development of advanced organic materials and innovative approaches to cancer diagnostics and therapeutics (theranostics) as well as bioelectronic applications.[3]

In addition, the environment and environmental sustainability hold a strategic research position for NHRF, as teams from the Natural Sciences Institutes conduct cutting-edge research for innovative applications in the field of clean energy, such as the development of advanced functional nanomaterials and organic photovoltaics (OPVs), the electrocatalytic production of hydrogen and the photo-electrochemical elements for the production of electricity, the creation of (bio)sensors for the detection of biomolecules/metal cations, toxic and industrial atmospheric pollutants, etc. At the same time, IHR/NHRF conducts historical research on environmental issues, while contributing to the planning of practices for the protection of the country's cultural monuments.

[3] See Section 4.1 "Planning the creation of a unique Center of Excellence; from a successful grant proposal to a major investment for the future"

Transparency in governance

Over the last two years, NHRF has made it a priority to upgrade its internal governance through the establishment of comprehensive and transparent procedures and practices. In September 2021, the Ministerial Decision on the Internal Rules of Procedure of NHRF was published serving as the culmination of a continuous effort in recent years for a more structured, clear, and at the same time flexible governance. In particular, the Internal Rules of Procedure elaborate on the operating practices of NHRF directly related to the smooth fulfillment of the Foundation's mission as well as the policies applied to upgrade the ongoing research and the wider NHRF's presence in the united research area. The Internal Rules of Procedure aim to monitor the organization and operation of the Foundation while ensuring its integrity and reputation. They also seek to ensure the transparency of research activities and administrative procedures, the effectiveness of the management and decision-making as well as compliance with legislation and obligations for research institutes arising from the Greek State.

Provision of equal opportunities

NHRF ensures equality and equal opportunities provision, while its inclusive culture is reflected in employees, research candidates, suppliers, partners, and visitors. NHRF aims to provide equal opportunities for everyone, but the emphasis is given to under-represented or minority groups who may be distinguished by their beliefs, special skills, age, gender, or sexual orientation. In the light of our long-standing commitment to equality, we have further strengthened our efforts to address potential gender inequalities and discrimination by introducing, in December 2021, a comprehensive three-year plan for gender equality (Gender Equality Plan). This plan is expected to enable the assigned committee to efficiently monitor and settle any discrimination cases that may occur within NHRF.

As the goal of the NHRF's Gender Equality Plan is to set priorities and interventions for gender equality as well as to address any inequalities that may have existed so far within it, this extends around five (5) equivalent priority/intervention areas:

- gender in research
- gender in recruitment, retention, and professional development
- gender in leadership and decision making
- work-life balance
- sexual violence and harassment.

Contribution to the achievement of the Sustainable Development Goals (Sustainable Development Goals – SDGs)

NHRF, through the research activities of its Institutes, is in line with some of the Sustainable Development Goals (SDGs) set by the United Nations (UN) for a more sustainable society by 2030.

Sustainable Development Goals (SDGs)		Institute
7 AFFORDABLE AND CLEAN ENERGY	• Renewable energy sources – conversion and storage of sustainable energy (e.g. solar, water, hydrogen), efficiency, alternative fuel technologies	TPCI/NHRF
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE; 11 SUSTAINABLE CITIES AND COMMUNITIES	• Urban development and sustainable living (SDG 9 - Industry, Innovation and Infrastructure and SDG 11- Sustainable Cities and Communities) including clean/ green technologies and engineering, sustainable/green buildings, waste management	TPCI/NHRF
2 ZERO HUNGER; 3 GOOD HEALTH AND WELL-BEING; 6 CLEAN WATER AND SANITATION; 12 RESPONSIBLE CONSUMPTION AND PRODUCTION	• Health and well-being including nanomedicine solutions for cancer treatment, disease diagnosis, water processing, and sustainable and productive agriculture	TPCI/NHRF
3 GOOD HEALTH AND WELL-BEING	• Development of new bioactive compounds against selected therapeutic targets and evaluation in respective preclinical disease models, to utilize their dynamics for innovative approaches to disease prevention and treatment • Discovery and identification of biomarkers related to diseases and drugs through modern holistic approaches for degenerative diseases, such as cancer, and neurodegenerative diseases but also for aging and parasitic diseases.	ICB/NHRF
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	• Development of new knowledge for the promotion of industrial innovation in the fields of health, food, and cosmetics as well as environmentally friendly technologies	ICB/NHRF
11 SUSTAINABLE CITIES AND COMMUNITIES	• Preservation, documentation, and promotion of tangible and intangible cultural heritage/ Strengthening efforts to protect and preserve the world's cultural and natural heritage	IHR/NHRF
13 CLIMATE ACTION	• Study of environmental history and management of natural resources, aiming at the production of new knowledge and the improvement of awareness as well as the relevant policies utilizing the historical experience	IHR/NHRF

Establishment of the Research Ethics and Compliance Committee

In October 2020, the NHRF Research Ethics and Compliance Committee was established, under the provisions of Law 4521/2018, Articles 21-27 as applicable. The mission of the Committee is to guarantee at ethical level the reliability of research projects/programs held at NHRF. The Committee checks whether a research project/programme is carried out with respect for the value of human beings and their constitutional rights, the autonomy of the persons participating, their privacy and personal data, as well as with care for the natural and cultural environment. The Committee also monitors compliance, in the context of research projects/programs, the generally accepted principles of its integrity research, and the criteria of good scientific practices. The control of research ethics constitutes an essential guarantee of reliability, contributes to the achievement of excellence, and is a condition for strengthening the trust and acceptance of the research carried out at NHRF by society as a whole.

The Committee elaborated and formulated the Code of Ethics and Conduct of Scientific Research of NHRF as well as the Regulation of Application of Principles and Operation which were approved by the NHRF Board of Directors ensuring that way the basic authorities in matters related to the protection of research ethics at NHRF.

Initiatives for Open Science

Open Science is the new standard of practices, means, and collaboration for producing and distributing scientific output and research results, with a direct scientific, economic, and societal impact. Open Science is a crucial priority of the European Union (EU), contributing to our sustainable development, increased production and exploitation of research output, and democratization of knowledge.

In 2021, the NHRF Open Science Committee was established with the aim of shaping the Foundation's policy regarding the availability of open scientific data and the selection of the appropriate tools and synergies for the successful transition to the new requirements for Open Science.

At the same time, NHRF has been among the 13 institutional organizations of the Hellenic Open Science Initiative – HOSI. HOSI aims to implement Open Science policies in Greece and support the national representation and contribution to the European Open Science Cloud (EOSC). EOSC aims to develop a unified interdisciplinary online environment where scientists can easily publish, find, and reuse data, tools, and services to perform their research tasks according to set scientific standards.

4. KEY ACHIEVEMENTS AND DISTINCTIONS/AWARDS

2020

06.2020

Distinction of the spin-off company "ResQBiotech", represented by the researcher of ICB/NHRF Dr. G. Skretas, as one of the most promising scientific companies in the innovation competition "The Spinoff Prize 2020" organized by Nature journal and Merck company

07.2020

Adoption of an amendment to article 54 of Law 4712/29-7-2020 regarding the retention of the Library "K. Th. Dimaras" by NHRF

09.2020

A breakthrough in the development of high-performance organic photovoltaics was published in the leading journal Nature Energy by the researchers Dr. Ch. Chochos (ICB/NHRF) and Dr. V. Gregoriou https://doi.org/10.1038/s41560-020-00684-7

12.2020

Award from the Academy of Athens for two publications of the researchers of IHR/NHRF: S. Kremydi [GP Economou Award for the monograph "Autonomous Coinages under the Late Antigonids", Meletemata 79, NHRF, Athens 2018 (2020)] and E. Liata [Eleni and Panos Psimmenos Award for the book «Εκ του υστερήματος αρμάτωσαν...Η φρεγάτα «Τιμολέων» στην επανάσταση του 1821»(NHRF, Athens 2021)]

2021

05.2021

Extension, until the end of 2023, for the cooperation of the Athens Comprehensive Cancer Center (ACCC) with the German Cancer Research Center (DKFZ), after a successful external mid-term evaluation conducted within the framework of the cooperation "Helmholtz European Partnering

06.2021

Preliminary approval of € 30.7 funding from the Recovery & Resilience Facility (RRF) and the European Investment Bank (EIB) for the establishment of a NHRF Center of Excellence, focusing on research in cancer theranostics and bioelectronic applications
—
Award for their invention in the field of bioelectronic devices for the researchers Dr. V. Gregoriou, Dr. Ch. Chochos and M. Spanos, within the framework of the 4th Hellenic Inventor Awards organized by the Industrial Property Organization (OBI)

09.2021

Approval and publication of the NHRF Internal Rules of Procedure

10.2021

International distinction for Dr. E.I. Kamitsos (TPCI/NHRF) with the "2021 Alfred R. Cooper Award" of the American Ceramic Society (ACerS) for his significant record of accomplishments in both spectroscopy of glass and experimental studies of glass structure and ion dynamics

4.1 Planning the creation of a unique Center of Excellence: from a successful grant proposal to a major investment in the future

In June 2021, the NHRF's grant proposal of €30,7 for the establishment of a Center of Excellence for the development of advanced organic materials and novel approaches to cancer theranostics and bioelectronic applications was preapproved to be funded by the Recovery & Resilience Facility (RRF) and the European Investments Bank (EIB), within the framework of the Ministry of Development & Investments' project entitled "Creation - Expansion - Upgrading of the Infrastructures of research centers supervised by the General Secretariat for Research and Innovation (GSRI)".

More specifically, the NHRF is expected to meet the project's goals, mainly, through the upgrade of the NHRF's research infrastructures, especially:

- the purchase of state-of-the-art laboratory equipment,
- the set-up of new infrastructures,
- interventions for the modernization of the existing infrastructures (laboratories of approximately 1000 m^2 area), as well as other small-scale interventions in specific offices and seminar rooms,
- the energy upgrade of the entire NHRF's building complex and its partial renovation.

The main goal of this project is to further strengthen the research capacity of NHRF and the potential it demonstrates in fundamental and innovative fields of science and technology, such as therapeutics and bioelectronics in the approach and treatment of cancer. In particular, the proposed Project seeks to:

- capitalize on the progress made so far in the field of health and materials, through the consolidation of wider synergies and cooperation of its two Natural Sciences Institutes (ICB/NHRF and TPCI/NHRF),
- encourage NHRF researchers to contribute to the above selected areas of health by conducting research in advanced organic materials, nano-materials, and drug discovery, where the inter-disciplinary approach is necessary from the earliest stages of research,
- bring NHRF researchers to even closer collaboration with clinical scientists, to meet unmet and/or undefined clinical needs.

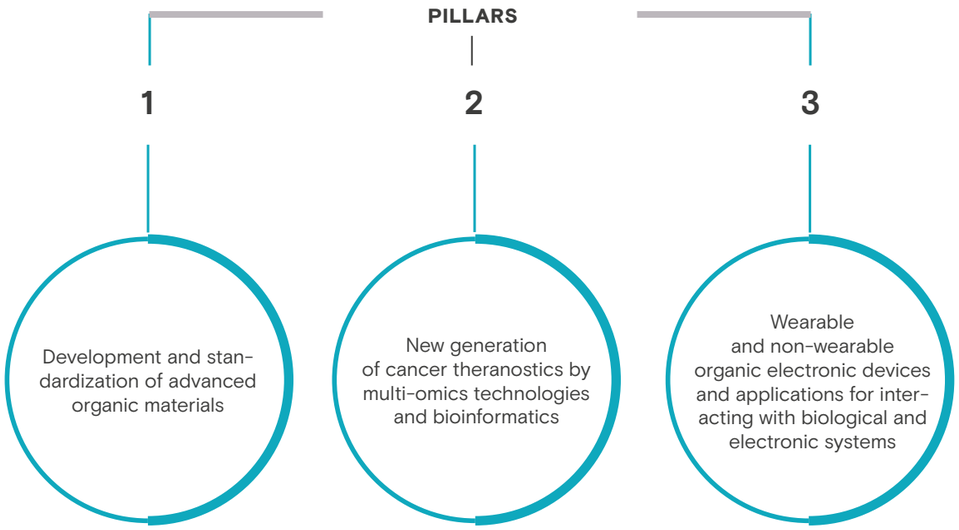
Funding pre-approval

for the creation of a unique Center of Excellence

30,7

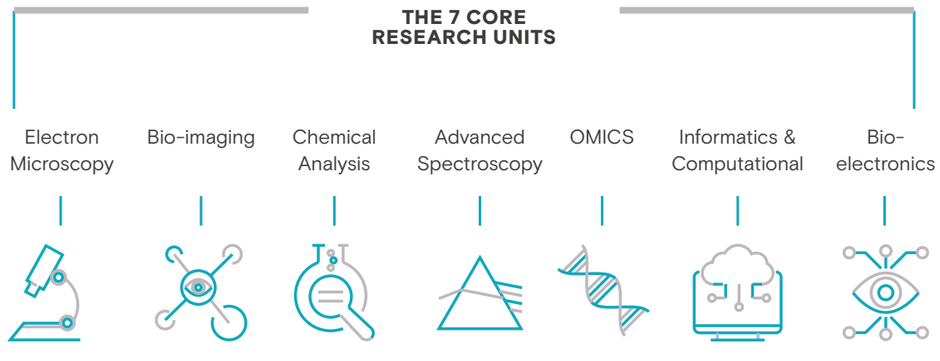
The main goal of this project is to further strengthen the research capacity of NHRF and the potential it demonstrates in fundamental and innovative fields of science and technology.

The NHRF's Centre of Excellence will cover three (3) highly challenging technological pillars:



The Centre of Excellence to be established will focus on:

- the development of the next generation of bioactive compounds, conjugated polymers-dyes, and nanomaterials, which will be used as new conductive and stretchable electrodes and as drugs against cancer,
- a platform at the level of multiple omics of new generation technologies that in combination can contribute to the individualized treatment of cancer through the discovery of new biomarkers, drug discovery and photodynamic/photothermal therapies,
- bioelectronics for the development of wearable (non-invasive) and implantable organic bioelectronic and targeted drug delivery.



4.2 Accelerating toward the Athens Comprehensive Cancer Center's (ACCC's) establishment

One of the strategic goals of NHRF and ICB, especially, is the establishment of the first Athens Comprehensive Cancer Center (ACCC) the constitution of which is a flagship initiative of great impact on the public health sector. ACCC consists of selected laboratories in Research Centers, Universities, and Hospitals in the entire city of Athens while predicting collaboration with companies in the pharmaceutical and biotechnology industry, diagnostics, and bioinformatics.

The main goals of ACCC are:

Strengthening translational research

Providing access to healthcare with innovative clinical and laboratory methods developed in collaboration with two leading cancer research centers, mainly the German Cancer Research Center (DKFZ, Heidelberg, Germany) and The Institute of Cancer Research (ICR, Sutton, UK).

NHRF, through ACCC, has been partnered with DKFZ and the National Center for Tumor Diseases (NCT) in Heidelberg, within the framework of the "Helmholtz European Partnering" program which is 50% funded by Helmholtz Association, specifically with € 2,5, for the period 2018-2023, while the other half of funding comes from DKFZ.

In May 2021, an interim evaluation of the ACCC's cooperation with the German Cancer Research Center (DKFZ) was carried out by the Helmholtz Association concluding that ACCC project has been particularly successful regarding the quality of research work produced as well as the strategic correlation of ACCC initiative.

One of the strategic goals of NHRF and ICB, especially, is the establishment of the first Athens Comprehensive Cancer Center (ACCC) the constitution of which is a flagship initiative of great impact on the public health sector.

Achievements of the ACCC's cutting-edge research

In the last few years, more than 40 pediatric cancers have been tested with low-cov WGS, Exome sequencing, RNA sequencing, gene expression, DNA methylation at DKFZ. Through the "Helmholtz European Partnering", Greece, through ACCC, has entered the following five international multicenter studies:

- INFORM Registry
- PTT2.0 Study
- MNP2.0 Registry
- LOGGIC Core
- Μελέτη PNET5

At the same time, ACCC has developed significant research activity in colorectal cancer (CRC), with the emphasis in this area to be given on elucidating the molecular background of mutant colon cancers KRAS/BRAF. For this purpose, samples of more than 30 Greek patients with primary colon cancer have been sent from the General Hospital of Athens to DKFZ (Division of Molecular Genome Analysis) for whole-genome sequencing and RNA sequencing analyses.

In the bio-imaging field, conjugated polymers have been synthesized by absorption and/or fluorescence in the visible and/or infrared spectrum. In addition, the formation of nanoparticles in aqueous solutions has been completed. These nanoparticles are eligible for use in biological applications such as fluorescence or photoacoustic imaging and as photodynamic and/or photothermal therapy and have been tested in vitro and in vivo. The polymers that act best as imaging and/or therapeutic agents are further used as nanocarriers for the encapsulation of inhibitors in order to form drug delivery systems.

International multi-center studies
→ HELMHOLTZ EUROPEAN PARTNERING

5

Million € funding
→ ΑΠΟ HELMHOLTZ ASSOCIATION
→ 2018-2023

2,5

4.3 The retention of the Library of Science, Technology and Culture "K. Th. Dimaras" by NHRF

In July 2020, the Hellenic Parliament voted on the amendment regarding the retention of "K.Th. Dimaras" Library, its people and resources by NHRF. This development was the result of the common inquiry of both NHRF Management and Staff Association, since the separation of the National Documentation Center (EKT) was separated from NHRF.

This particularly beneficial outcome for NHRF and its resources was the result of intensive and fair negotiation with the ministries involved, for the retention of the Library on the premises and under the jurisdiction of the Foundation.

A few months later, in November 2020, a committee was appointed with the responsibility of proposing the subscriptions and other issues related to the continuation of the operation as well as the evolution of the Library.

The emblematic Library "K.Th. Dimaras" constitutes for more than 60 years a distinct yet inherent NHRF structure that functions as a scientific library that supports both the NHRF researchers and the entire scientific community in the search and utilization of international bibliographic sources. It is, therefore, the most important public academic library in the center of Athens, since the 1960s, widely known as the NHRF's Library.

4.4 Other distinctions of the Natural Sciences Institutes

Institute of Chemical Biology — ICB/NHRF

Publications in top-tier scientific journals

- Classen, A., **Chochos, C.L.**, Lueer, **L.***, **Gregoriou, V.G.**, Wortmann, J., Osvet, A., Forberich, K., McCulloch, I., Heumueller, T.*, Brabec, C.J.* (2020). The role of exciton lifetime for charge generation in organic solar cells at negligible energy-level offsets. Nature Energy 5, 711–719 https://doi.org/10.1038/s41560-020-00684-7 (IF: 60.858)
- Hatzioannou, A., Banos, A., Sakelaropoulos, T., Fedonidis, C., **Vidali, M.-S.**, Kohne, M., Handler, K., Boon, L., Henriques, A., Koliaraki, V., **Georgiadis, P.**, Zoidakis, J., Termentzi, A., Beyer, M., Chavakis, T., Boumpas, D., Tsirigos, A., Verginis, P.* (2020). An intrinsic role of IL-33 in Treg cell-mediated tumor immunoevasion. Nature Immunology 21, 75–85. https://doi.org/10.1038/s41590-019-0555-2 (IF: 25.606)
- Gasparini, **N.***, Camargo, F.V.A., Fruehwald, S., Nagahara, T., Classen, A., Roland, S., Wadsworth, A., Gregoriou, V.G., **Chochos, C.L.**, Neher, D., Salvador, M., Baran, D., McCulloch, I., Goerling, A., Lueer, L.*, Cerullo, G., Brabec, C.J.* (2021). Adjusting the energy of interfacial states in organic photovoltaics for maximum efficiency. Nature Communications 12. https://www.nature.com/articles/s41467-021-22032-3 (IF: 14.919)
- Vasilopoulou, **M.***, bin MohdYusoff, A.R., Daboczi, M., Conforto, J., Gavim, A.E.X., da Silva, W.J., Macedo, A.G., Soultati, A., Pistolis, G., Schneider, F.K., Dong, Y., Jacoutot, P., Rotas, G., Jang, J., Vougioukalakis, G.C., **Chochos, C.L.***, Kim, J.-S., Gasparini, N.* (2021). High efficiency blue organic light- emitting diodes with below- bandgap electroluminescence. Nature Communications 12. https://doi.org/10.1038/s41467-021-25135-z (IF: 14.919)
- **Lefaki, M.**, **Papaevgeniou, N.**, Tur, J.A., Vorgias, C.E., Sykiotis, G.P., **Chondrogianni, N.*** (2020). The dietary triterpenoid 18 alpha-Glycyrrhetinic acid protects from MMC-induced genotoxicity through the ERK/Nrf2 pathway. Redox Biology 28. https://doi.org/10.1016/j.redox.2019.101317 (IF: 11.799)
- Sacramento, E.K., Kirkpatrick, J.M., Mazzetto, M., Baumgart, M., Bartolome, A., Di Sanzo, S., Caterino, C., Sanguanini, M., **Papaevgeniou, N.**, **Lefaki, M.**, Childs, D., Bagnoli, S., Tozzini, E.T., Di Fraia, D., Romanov, N., Sudmant, P.H., Huber, W., **Chondrogianni, N.**, VenDr.uscolo, M., Cellerino, A.*, Ori, A.* (2020). Reduced proteasome activity in the aging brain results in ribosome stoichiometry loss and aggregation. Molecular Systems Biology 16. https://doi.org/10.15252/msb.20209596 (IF: 11.429) [Cover page]
- Gkikas, D., **Stellas, D.**, Polissidis, A., Manolakou, T., Kokotou, M.G., Kokotos, G., Politis, P.K.* (2021). Nuclear receptor NR5A2 negatively regulates cell proliferation and tumor growth in nervous system malignancies. Proceedings of the. National Academy of Sciences USA 118. https://doi.org/10.1073/pnas.2015243118 (IF:11.205)

*denotes corresponding author; ICB researchers in bold

Theoretical & Physical Chemistry Institute — NHRF

Awards

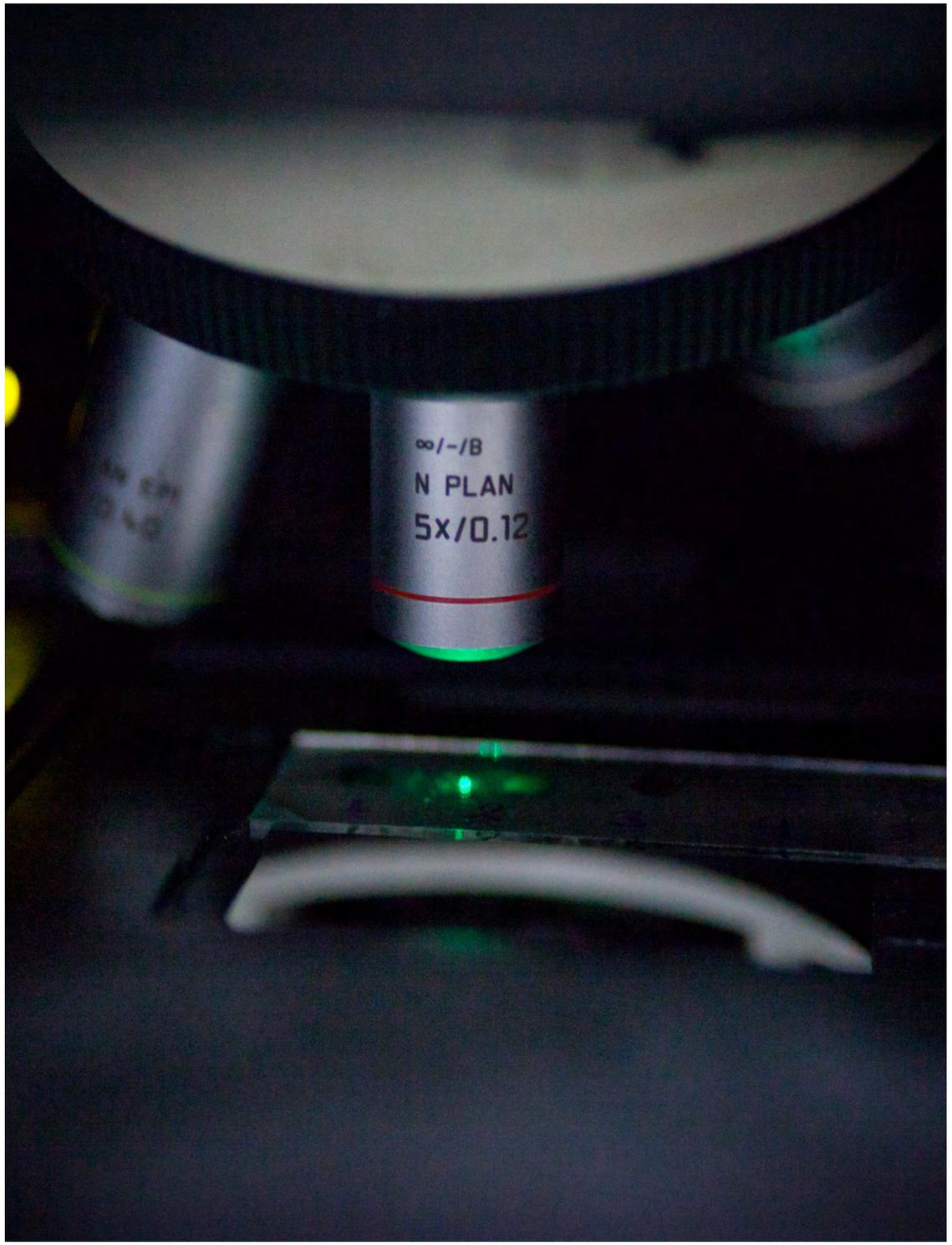
- Dr. N. Tagmatarchis: Chemistry Europe Fellow Class 2018/2019 (Announced 31.03.2020)
- V. Chrysostomou, Ph.D. Candidate: Best Poster Prize, 13th Hellenic Polymer Society International Conference, Athens, Greece (12-16.12.2021).
- Dr. E. I. Kamitsos: Alfred R. Cooper Award, American Ceramic Society (2021).
- N. Tagiara: Thomaidis Award, NTUA, for high-quality research (2017, 2019, 2020).
- G. Chatzigiannakis: Best european postgraduate thesis, Material Science and Engineering Award, by the Federation of European Materials Societies (FEMS). Thesis title: "Development of optoelectronic devices based on Si/ZnO nano- heterostructures". Supervisor: Dr. M. Kandyla(07.2020)

Outstanding articles

- August 2017 - November 2021: in the top 1% of its academic field; "Synthesis, thermal and structural properties of pure TeO_2 glass and zinc-tellurite glasses". N. S. Tagiara, **D. Palles**, **E. D. Simandiras**, V. Psycharis, A. Kyritsis, **E. I. Kamitsos**, J. Non-Cryst. Solids 2017, 457, 116.
- May 2018 - September 2021: in the top 1% of its academic field; "Removal of phosphate from aqueous solutions by adsorption onto $Ca(OH)_2$ treated natural clinoptilolite", D. Mitrogiannis, M. Psychoyou, I. Baziotis, V. Inglezakis, N. Koukouzas, N. Tsoukalas, **D. Palles**, **E. I. Kamitsos**, G. Oikonomou, G. Markou, Chem. Eng. J. 2017, 320, 510.
- PCCP "Hot article collection" 2020: "Anion polarizabilities in oxy-nitride glasses. Establishing a common optical basicity scale", D. Möncke, S. Ali, B. Jonson, **E. I. Kamitsos**, Phys. Chem. Chem. Phys. 2020, 22, 9543.

Distinctions

- Dr. N. Tagmatarchis is included in the Top 2% Scientists Worldwide in Chemistry in the field of Nanoscience & Nanotechnology and associated sub-field Organic Chemistry for 2021 according to J. Baas, K. W. Boyack, J. P. A. Ioannidis (19 October 2021), "August 2021 data-update for updated science-wide author databases of standardized citation indicators", DOI: https://doi.org/10.17632/btchxktzyw.3, for 2020 according to J. Baas, K. W. Boyack J. P. A. Ioannidis (8 October 2020) "Data for updated science-wide author databases of standardized citation indicators", DOI: https://doi.org/10.17632/btchxktzyw.2
- Dr S. Pispas is included in the Top 2% Scientists Worldwide in Chemistry in the field of Polymers and associated sub-field Chemical Physics for 2021 according to J. Baas, K. W. Boyack, J. P. A. Ioannidis (19 October 2021), "August 2021 data-update for updated science-wide author databases of standardized citation indicators", DOI: https://doi.org/10.17632/btchxktzyw.3, for 2020 according to J. Baas, K. W. Boyack J. P. A. Ioannidis (8 October 2020) "Data for updated science-wide author databases of standardized citation indicators", DOI: https://doi.org/10.17632/btchxktzyw.2



4.5 Competitive projects*

*as competitive were selected to be presented projects whose budget is over €100,000

Institute of Historical Research — IHR/NHRF

- **ANAVATHMIS**
  Development of historical research: studies and digital applications
  Grant amount: €830.000,00
  Funding scheme: NSRF 2014-2020, "KRIPIS II"
  Implementation period: 1/1/2017 - 31/12/2021
  Principal Investigator: Dr. M. Ch. Chatziioannou

- **CyCoMed –Cypriot connectivity in the Mediterranean from the Late Bronze Age to the End of the Classical Period**
  Grant amount: €159.333,33
  Funding scheme: HFRI, 1st Announcement of ELIDEK Research Projects for the Support of Postdoctoral Researchers
  Implementation period: 12/10/2018 - 11/4/2022
  Principal Investigator: Dr. G. Bourogiannis

- **Byzantine Literary Sources for the History and Civilization of Arabs and Arabia.**
  Grant amount: €117.300,00
  Funding agency: King Abdul Aziz Foundation for Research and Archives. Collaboration with King Abdul Aziz Foundation for Research and Archives, Riyadh, Saudi Arabia
  Implementation period: 01/2019 – 01/2022
  Principal Investigator: Dr. M. Leontsini

- **German military and paramilitary database units in Greece 1941-1944/45**
  Grant amount: €348.507,00
  Funding body: German Ministry of Foreign Affairs, Hellenic-German Fund for the Future
  Implementation period: 10/05/2019 – 13/12/2021
  Principal Investigators: Dr. V. Schneider - Dr. L. Kallivretakis

- **100 memories: Integrated Action for physical and digital documentation and promotion of Asia Minor refugee memory**
  Grant amount: €299.900,00
  Funding scheme: NSRF 2014-2020, "RESEARCH-CREATE-INNOVATE"
  Implementation period: 29/10/2020 – 28/10/2023
  Principal Investigator: Dr. E. Kyramargiou

- **SOW - Science and Orthodoxy around the World**
  Grant amount: €683.199,00
  Funding agency: Templeton World Charity Foundation
  Implementation period: 1/6/2020 - 31/5/2023
  Principal Investigator: Dr. E. Nikolaidis

Institute of Chemical Biology — ICB/NHRF

- **STHENOS-b: Targeted therapeutic approaches against degenerative diseases with special focus on cancer and ageing-optimisation of the targeted bioactive molecules**
  Grant amount: €790.000,00
  Funding scheme: NSRF 2014-2020, "KRIPIS II"
  Implementation period: 1/11/2017 - 30/6/2021
  Principal Investigator: Dr. A. Pintzas

- **CO2-BIOPRODUCTS - Bioconversion of CO2 into high added value bioproducts through sustainable microalgae cultivation processes**
  Grant amount: €150.000,10
  Funding scheme: NSRF 2014-2020, "RESEARCH - CREATE - INNOVATE"
  Implementation period: 25/7/2018 - 24/6/2022
  Principal Investigator for ICB/NHRF: Dr. M. Zoumpanioti

- **TRANSITION: "TRANSlating the complexIty of melanoma diagnosis into rational therapeutic stratificatiON"**
  Grant amount: €136.398,36
  Funding scheme: NSRF 2014-2020, "RESEARCH - CREATE - INNOVATE"
  Implementation period: 25/7/2018 - 24/4/2022
  Principal Investigators for ICB/NHRF: Dr. A. Chatziioannou, Dr. O. Papadodima

- **Preclinical studies of pharmacological interest on potent inhibitors of the Alzheimer's Disease**
  Grant amount: €210.000,00
  Funding scheme: NSRF 2014-2020, "RESEARCH - CREATE - INNOVATE"
  Implementation period: 9/7/2018 - 9/10/2022
  Principal Investigator for ICB/NHRF: Dr. N. Chondrogianni

- **QFytoTera - Nanoemulsions of plant oils with moisturizing and insect repellent properties**
  Grant amount: €289.900,35
  Funding scheme: NSRF 2014-2020, "RESEARCH - CREATE - INNOVATE"
  Implementation period: 9/7/2018 - 8/7/2022
  Principal Investigator: Dr. S.E. Zographos

- **Formulation of Greek Flora derived innovative dietary supplements aiming to improve specific molecular biomarkers**
  Grant amount: €349.982,05
  Funding scheme: NSRF 2014-2020, "RESEARCH - CREATE - INNOVATE"
  Implementation period: 18/7/2018 - 17/5/2022
  Principal Investigator: Dr. S. Gonos

- **Identification of new prognostics biomarkers for prostate cancer**
  Grant amount: €214.000,00
  Funding scheme: NSRF 2014-2020, "RESEARCH - CREATE - INNOVATE"
  Implementation period: 31/7/2018 - 30/7/2021
  Principal Investigator for ICB/NHRF: Dr. V. Zoumpourlis

- **AgroWasteForNutritiousMushrooms- Valorization of agricultural by- products as new substrates for the production of Pleurotus mushrooms with high nutritional value – Development and clinical evaluation of an innovative polyvalent functional food ("mushroom snack") with enhanced content in bioactive compounds (vitamin D and antioxidants)**
  Grant amount: €161.401,50
  Funding scheme: NSRF 2014-2020, "RESEARCH - CREATE - INNOVATE"
  Implementation period: 25/7/2018 - 24/10/2022
  Principal Investigator for ICB/NHRF: Dr. P. Zoumpoulakis

- **FUNglucan - Development of a novel FUNctional food enriched with β- glucans isolated from edible mushrooms of Greek habitats**
  Grant amount: €330.000,00
  Funding scheme: NSRF 2014-2020, "RESEARCH - CREATE - INNOVATE"
  Implementation period: 18/7/2018 - 17/6/2022
  Principal Investigator for ICB/NHRF: Dr. V. Pletsa

- **ProMiDis - A unified Drug discovery platform for protein misfolding diseases**
  Grant amount: €1.972.000,00
  Financing scheme: H2020: ERC-2018-CoG
  Implementation period: 1/3/2019 - 28/2/2024
  Principal Investigator: Dr. G. Skretas

- **Hellenic Precision Medicine Network in Oncology**
  Grant amount: €250.000,00
  Funding body: GSRI (in the framework of the Compromise Agreement between 22/8/2012 between the Hellenic Republic and the companies SIEMENS A.G. and SIEMENS SA)
  Implementation period: 22/8/2018 - 31/12/2021
  Principal Investigator for ICB/NHRF: Dr. A. Pintzas

- **INSTRUCT ULTRA - Releasing the full potential of Instruct to expand and consolidate infrastructure services for integrated structural life science research**
  Grant amount: €100.000,00
  Financing scheme: European Commission, H2020-INFRADEV '2016-1
  Implementation period: 1/1/2017 - 31/12/2020
  Principal Investigator for ICB/NHRF: Dr. E.D. Chrysina

- **EuroNeurotrophin - A European training network for the development of neurotrophin small molecule mimetics as candidate therapeutic agents for neurodegeneration and neuroinflammation (including the Consortium Management & Training)**
  Grant amount: €638.133,94
  Funding Scheme: H2020-MSCA-ITN-2017, European Commission
  Implementation period: 1/1/2018 - 31/3/2022
  Principal Investigator: Dr. Th. Kalogeropoulou

- **BIOIMAGING-GR-EIE-: A Greek Infrastructure for Visualising and Monitoring Fundamental Biological Processes**
  Grant amount: €170.507,52
  Funding scheme: NSRF 2014-2020, "Strengthening Research and Innovation Infrastructure"
  Implementation period: 1/1/2018 - 31/10/2021
  Principal Investigator for ICB/NHRF: Dr. Th. Kalogeropoulou

- **OPENSCREEN-GR - An Open-Access Research Infrastructure of Chemical Biology and Target- Based Screening Technologies for Human and Animal Health Agriculture and the Environment**
  Grant amount: €237.500,00
  Funding scheme: NSRF 2014-2020, "Strengthening Research and Innovation Infrastructure"
  Implementation period: 1/1/2018 - 31/10/2021
  Principal Investigator for ICB/NHRF: Dr. Th. Kalogeropoulou

- **DINNESMIN - Preclinical development of innovative neuroprotective and neuroregenerative synthetic microneurotrophins for the therapy of Alzheimer's disease**
  Grant amount: €259.750,00
  Funding scheme: NSRF 2014-2020, "RESEARCH - CREATE - INNOVATE"
  Implementation period: 6/9/2018 - 5/3/2022
  Principal Investigator for ICB/NHRF: Dr. Th. Kalogeropoulou

- **RESET: "Bio-inspired antiaging proteasome activators"**
  Grant amount: €454.240,00
  Funding scheme: NSRF 2014-2020, "RESEARCH – CREATE – INNOVATE"
  Implementation period: 18/7/2018 - 17/1/2022
  Principal Investigator: Dr. M. Koufaki

- **INSPIRED - THE NATIONAL RESEARCH INFRASTRUCTURES ON INTEGRATED STRUCTURAL BIOLOGY, DRUG SCREENING EFFORTS AND DRUG TARGET FUNCTIONAL CHARACTERIZATION - Instruct-EL Hub: Center for providing and developing Integrated Structural Biology Services**
  Grant amount: €540.875,00
  Funding scheme: NSRF 2014-2020, "Strengthening Research and Innovation Infrastructure"
  Implementation period: 3/9/2018 - 30/9/2022
  Principal Investigator: Dr. E. D. Chrysina

- **3D Orco - Advanced Research on the 3D structure of Mosquito Odorant Receptors coreceptor**
  Grant amount: €180.000,00
  Funding scheme: HFRI, 1st Announcement of HFRI Research Projects for the reinforcement of faculty members and Researchers and the supply of high value research equipment
  Implementation period: 28/2/2020 - 31/8/2023
  Principal Investigator: Dr. S.E. Zographos

- **CloudScreen - An "one stop shop" computational next generation platform toward Drug repositioning and repurposing in precision medicine**
  Grant amount: €352.561,98
  Funding scheme: NSRF 2014-2020, "RESEARCH - CREATE - INNOVATE"
  Implementation period: 12/5/2020 - 11/5/2023
  Principal Investigator: Dr. Th. Katsila

- **BIOKAPETPA - Determination of genomic and transcriptomic prognostic bio-signatures in head and neck cancer**
  Grant amount: €248.600,00
  Funding scheme: NSRF 2014-2020, "RESEARCH - CREATE - INNOVATE"
  Implementation period: 28/7/2020 - 27/7/2023
  Principal Investigator: Dr. V. Zoumpourlis

- **Fish_Superfoods – Development of new functional fish-superfood for more a efficient fish farming**
  Grant amount: €182,961.72
  Funding scheme: NSRF 2014-2020, "RESEARCH - CREATE - INNOVATE"
  Implementation period: 28/7/2020 - 27/7/2023
  Principal Investigator for ICB/NHRF: Dr. G. Skretas

- **OSTEOME Design and development of a novel food supplement for osteoporosis based on gut microbiome mechanisms. Efficacy and tolerability assessment**
  Grant amount: €387.800,00
  Funding scheme: NSRF 2014-2020 "RESEARCH - CREATE - INNOVATE"
  Implementation period: 28/7/2020 - 27/12/2023
  Principal Investigator for ICB/NHRF: Dr. P. Zoumpoulakis

- **AlphaSyn - Systematic development and commercial exploitation of novel aggregation inhibitors of the protein α-synuclein**
  Grant amount: €157.396,00
  Funding scheme: NSRF 2014-2020, "RESEARCH - CREATE - INNOVATE"
  Implementation period: 29/7/2021 - 28/11/2023
  Principal Investigator: Dr. G. Skretas

- **CoCCuS - Cost-effective CO2 Capture and Utilization from magnesite/lime industry using enzyme boosted K2CO3 Solvents**
  Grant amount: €210.157,75
  Funding scheme: NSRF 2014-2020, "RESEARCH - CREATE - INNOVATE"
  Implementation period: 30/9/2021 -29/11/2023
  Principal Investigator for ICB/NHRF: Dr. G. Skretas

- **Nano-UV-Extracts - Application of nanotechnology for the development of sunscreens using natural extracts**
  Grant amount: €100.000,00
  Funding agency: Provision of services
  Implementation period: 1/10/2020 - 27/1/2023
  Principal Investigator: Dr. A. Xenakis

Theoretical & Physical Chemistry Institute — TPCI/NHRF

- **PROTECT - Novel industrial materials with advanced multifunctionality, extended lifetime and improved performance towards environmental conditions as multipurpose protection means**
  Grant amount: €240.425,00
  Funding scheme: NSRF 2014-2020, "Cooperation of Industries with Research Organizations", "RESEARCH - CREATE - INNOVATE"NSRF 2014-2020
  Implementation Period: 28/07/2020 - 27/07/2023
  Principal Investigator: Dr. N. Tagmatarchis

- **NanoElectroCat - Modified carbon nanostructures and related 2D nanomaterials with small organic and coordination molecules as sustainable electrocatalysts**
  Grant amount: €164.000,00
  Funding scheme: HFRI, 2nd call for research projects to support postdoctoral researchers
  Implementation Period: 01/06/2021 - 31/05/2024
  Principal Investigator: Dr. A. Rapakousiou

- **NANOSHIELD - New generation, safe, nanotechnological products to control plant diseases while improving plant health**
  Grant amount: €196.000,00
  Financial scheme: NSRF 2014-2020, "RESEARCH-CREATE-INNOVATE"
  Implementation Period: 16/06/2020 - 15/06/2023
  Principal Investigator for TPCI/NHRF: Dr. A. Pispas

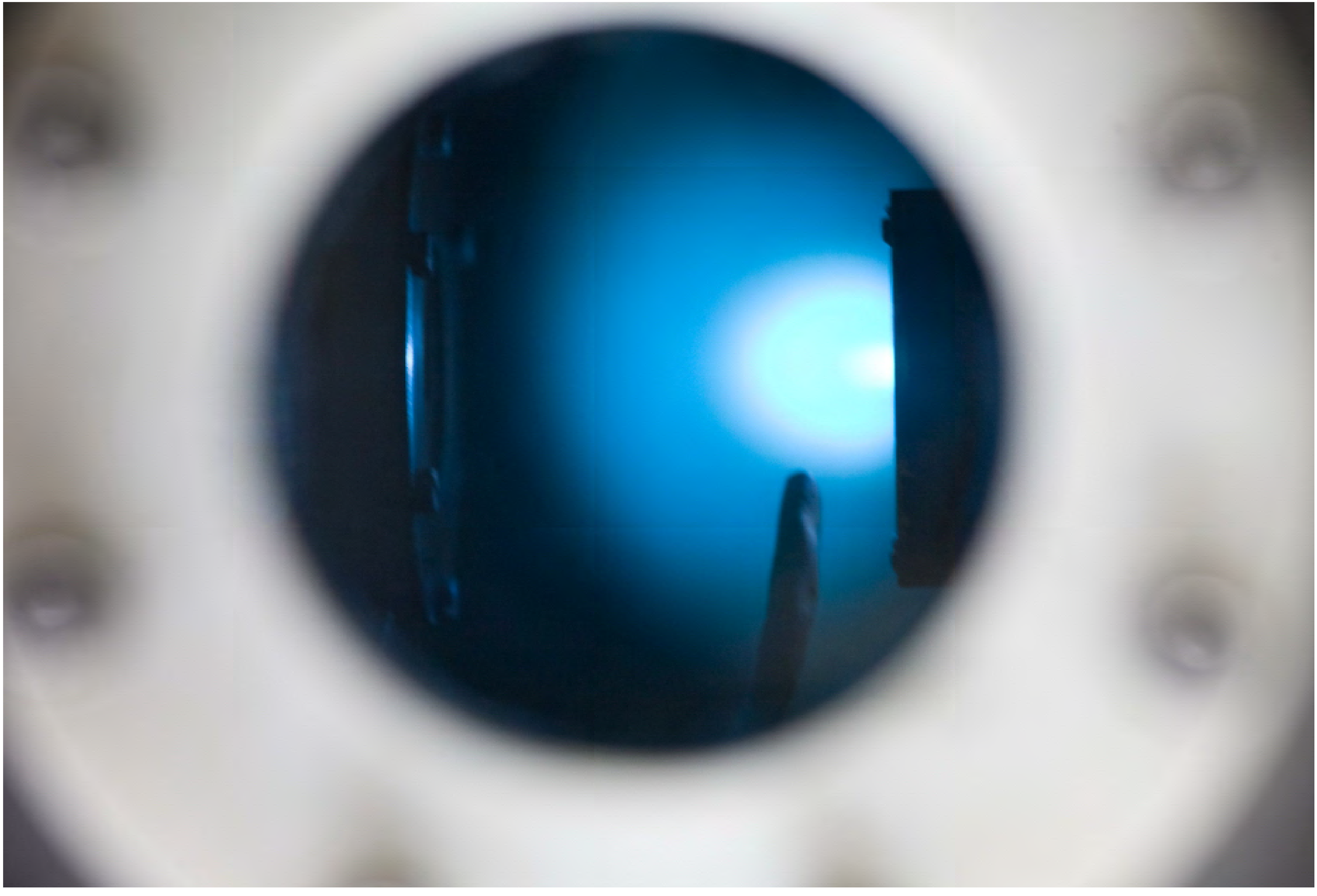
- **INNOVATION-EL Synthesis-functionality, vibrational and electronic spectroscopy of advanced materials", in the framework of the "National Infrastructure in Nanotechnology, Advanced Materials and Micro-Nanoelectronics**
  Grant amount: €400,000,00
  Funding scheme: NSRF 2014-2020, "Strengthening the Research and Innovation Infrastructure"
  Implementation Period: 01/04/2018 - 31/03/2022
  Principal Investigator for TPCI/NHRF: Dr. E.I. Kamitsos

- **Advanced materials and devices**
  Grant amount: €660.000,00
  Funding scheme: NSRF 2014-2020, "Strategic Development of the Research and Technological Sector"
  Implementation Period: 01/09/2017 - 28/02/2021
  Principal Investigator: Dr. E.I. Kamitsos

- **AMPERCEL - Advanced materials for perovskite solar cells**
  Grant amount: €164.000,00
  Funding scheme: HFRI, 2nd Call for Research Projects to support Postdoctoral Researchers
  Implementation Period: 01/04/2021 - 31/03/2024
  Principal Investigator: Dr. A. Kaltzoglou

- **InPhoQuC - Integrated Photonic Quantum Circuits**
  Grant amount: €199.650,00
  Funding scheme: HFRI, 1st Call for proposals for research projects to support faculty members and researchers working in Greek Universities and Research Centers and the supply of strategic research equipment
  Implementation Period: 26/04/2020 - 25/04/2024
  Principal Investigator for TPCI/NHRF: Dr. Ch. Riziotis

- **RocketSens - Cooperation for Photonic Sensors for Solid Rocket Motors Condition Monitoring**
  Grant amount: €181.200,00
  Funding agency: Industrial Financing / Cooperation Bayern Chemie mbH (Germany) and MBDA Missile Systems (Italy)
  Implementation Period: 30/10/2018 - 30/11/2024
  Principal Investigator: Dr. Ch. Riziotis



5. EDUCATION PROVISION

During the biennium, more than 300 young scientists were hosted and trained at the three NHRF Institutes:

About

100

undergraduate students

in the context of either elaboration of their dissertation or joint programs (IHR, ICB, TPCI)

More than

80

postgraduate students

completed their dissertation under the supervision of researchers from the two Natural Sciences Institutes (ICB and TPCI)

More than

35

Ph.D. candidates

completed their dissertations at the two Natural Sciences Institutes (ICB and TPCI)

More than

85

postdoctoral researchers

conducted their research in the laboratories of the Positive Institutes (ICB and TPCI)

Institute of Historical Research — IHR/NHRF

IHR/NHRF organizes specialized seminars that are part of Master programs (History & Archeology) of Greek Universities:

Post-Civil Greece (1949-1967) - Seminar on Political and Social Aspects
(SNR - with the University of Athens and Panteion University)

Interdisciplinary Postgraduate Seminar "Nikos Economides"
(SBR/IHR - University of Athens)

Greek-Latin World - Seminar 13th-18th century
(SBR/NHRF - University of Athens)

Ancient History Seminar
(SGRA/IHR - University of Athens)

In addition to the above seminars, the Institute's researchers have taught in 30 different M.A. in Greek and foreign universities.

Independent Seminars:

- The Ermoupolis Seminars, Syros (SNR)
- The Seminars of Historical Sciences, (SBR) Autumn Lectures in Classics, (SGRA/IHR)
- The Seminars of the Sector of Greek and Roman Antiquity (SGRA/IHR)

Co-organization of Independent Seminars:

- The Seminars of the Hellenic Society of Economic History (SNR/IHR)
- "Hermes o Logios" Seminars (SNR/IHR)

Summer Schools (organized/co-organized by IHR)

Note: During the years 2020-2021, all summer schools were canceled due to restrictions against Covid-19.

During 2018-2019, IHR/NHRF organized five (5) main summer programs:

- Exploring Business History in the Mediterranean, from Local to Global, Syros (SNR)
- Summer School of Science & Religion, Kolimbari, Crete (in collaboration with the Orthodox Academy of Crete) (SNR)
- Intensive Summer School of Ottoman and Turkish Studies, Cunda-Ayvalik, Turkey (in collaboration with Harvard and Koç Universities) (SNR)
- Summer School of Greek Paleography and Byzantine Inscription, Patmos (SBR)
- Summer School of Ancient Greek and Roman Numismatics, Athens (SGRA)

Institute of Chemical Biology — ICB/NHRF

ICB/NHRF operates as a training center at undergraduate, postgraduate, doctoral and postdoctoral levels and as such plays an important role in shaping and training the next generation of scientists.

Participation in International Educational University Programs

• ICB/NHRF is linked through a formal cooperation agreement with the University of Örebro, Sweden. The collaboration was formally established in 2008 with the common intention of the two organizations to collaborate in the fields of Medical Research and Life Sciences. He has already led 3 Docentships, 20 publications in peer-reviewed journals, 30 proceedings in scientific conferences/ workshops, and 4 full doctoral dissertations in recent years.

• ICB/NHRF participates in the strategic collaboration between the Integrated Cancer Center in Athens (ACCC) and DKFZ/NCT Heidelberg for Individualized Cancer Medicine. The departments providing postgraduate programs and clinical education as well as the educational activities of the Heidelberg Oncology School (NCT-HCO), the German Cancer Consortium (DKTK), and the ACCC are constantly training young researchers and clinical scientists in Athens, in the context of interdisciplinary research and translation research on cancer focusing on the key aspects of precision oncology.

• From 2018, ICB/NHRF actively participates in the Innovative Training Network (ITN) EuroNeurotrophin (Coordinator: Dr. Th. Kalogeropoulou). In a new effort to combat neurodegenerative diseases such as Alzheimer's disease, Parkinson's disease, Amyotrophic Lateral Sclerosis, and Multiple Sclerosis, the EU supports the efforts of the research consortium "EuroNeurotrophin" with € 3.56 million. The consortium is designed to highlight the need for the development of new therapies, through the collective training of 14 Early Stage Researchers. It includes 12 leading European research teams and 6 private complementary know-how companies covering all stages of drug discovery and development. At ICB/NHRF, two (2) ESRs (Ph.D. students) were supervised for 36 months each, while 3 additional ESRs have conducted posting research.

An important activity of ICB/NHRF was the continuation of the 5 interinstitutional Postgraduate programs (M.Sc.):

- The emblematic M.Sc."Bio-entrepreneurship" hosted at ICB/NHRF and organized jointly with the Department of Biology and Biochemistry of the University of Thessaly since 2015, is the first postgraduate program in Greece consisting of complex and transferable learning activities for the development of scientific and business skills in collaboration with a network of industrial partners. Nineteen (19) ICB/NHRF researchers participate as speakers, while four (4) of them participate in the administrative bodies of the Program. Also, nine (9) researchers of ICB/NHRF have been appointed as visiting professors at the University of Thessaly. The total duration of the Program has been attended by 115 students (until 2021) of which 57 have received their master's degree (14 during the period 2020-21). For the most part (66%) the dissertation was supervised by ICB/NHRF researchers. The majority of graduates (75%) are employed in large pharmaceutical, food, and biotechnology companies in Greece.
- The interinstitutional postgraduate program entitled "Oncology: From Oncogenesis to Therapy" which is co-organized jointly with the Medical School of the University of Crete. The program started in March 2019 and aims to train young scientists in modern approaches to detection, imaging, and diagnosis of human tumors, translation and clinical research, cancer prevention strategies, modern pharmacological treatments as well as an accurate and personalized cancer treatment. In the administrative bodies of the Postgraduate Program participate 4 researchers of ICB/NHRF, while the majority of them participate as lecturers. 51 students have attended the M.Sc. program of which 16 have received a M.Sc. in "Oncology".

An important activity of ICB/NHRF was the continuation of the 5 interinstitutional Postgraduate programs (M.Sc.):

- "Biotechnology" which is co-organized with the Department of Biology of NKUA. The M.Sc. "Biotechnology" was founded in October 2021 to produce trained staff for highly specialized positions in the public and private sectors both in Greece and abroad. This includes, but is not limited to, biotechnology-based organizations for the development of innovative products and services, such as the food, pharmaceutical, and cosmetics industries, manufacturers of diagnostics and biomedical materials, biorefinery, agriculture, and agricultural research companies, and diagnostic laboratories (private-public). In the administrative bodies of this Postgraduate Program 2 ICB/NHRF researchers participate.
- "Biochemistry and Chemical Biology" which is co-organized with the Department of Chemistry of NKUA, the Biomedical Research Foundation of the Academy of Athens (BRFAA), and the NCSR "Demokritos" and starts in 2022. The program will educate students on how to solve complex biological problems at the molecular level using integrated chemical, biochemical and biophysical methods. Students are expected to gain knowledge of the latest theoretical developments in the field of biochemistry and chemical biology by receiving high interdisciplinary education in the collaborating laboratories. 1 ICB/NHRF researcher participates in the administrative bodies of this Postgraduate Program.
- The "Athens International Master's Program in Neurosciences" co-organized by the Departments of Biology, Nursing, Dentistry, and the Medical School of NKUA, in collaboration with the Institute of Biomedical Research of the Academy of Athens (BRFAA), the Hellenic Pasteur Institute (HPI) the Research Center of Biomedical Sciences "Alexander Fleming"/(BSRC Fleming), the NCSR "Demokritos" and NHRF. One (1) ICB/NHRF researcher participates in the administrative bodies of this Postgraduate Program.

Theoretical & Physical Chemistry Institute — TPCI/NHRF

To strengthen its educational and training role, TPCI/NHRF has signed a formal agreement (MoU) with the School of Applied Mathematics & Natural Sciences of the NTUA, within the postgraduate program "Microsystems and Nanodevices", which allows the participation of TPCI/NHRF researchers in the teaching of postgraduate courses and the supervision of postgraduate students. In this context, Dr. S. Pispas, Dr. A. Papagiannopoulos, and Dr. N. Tagmatarchis participate in the course "Laboratory techniques for nanomaterials".

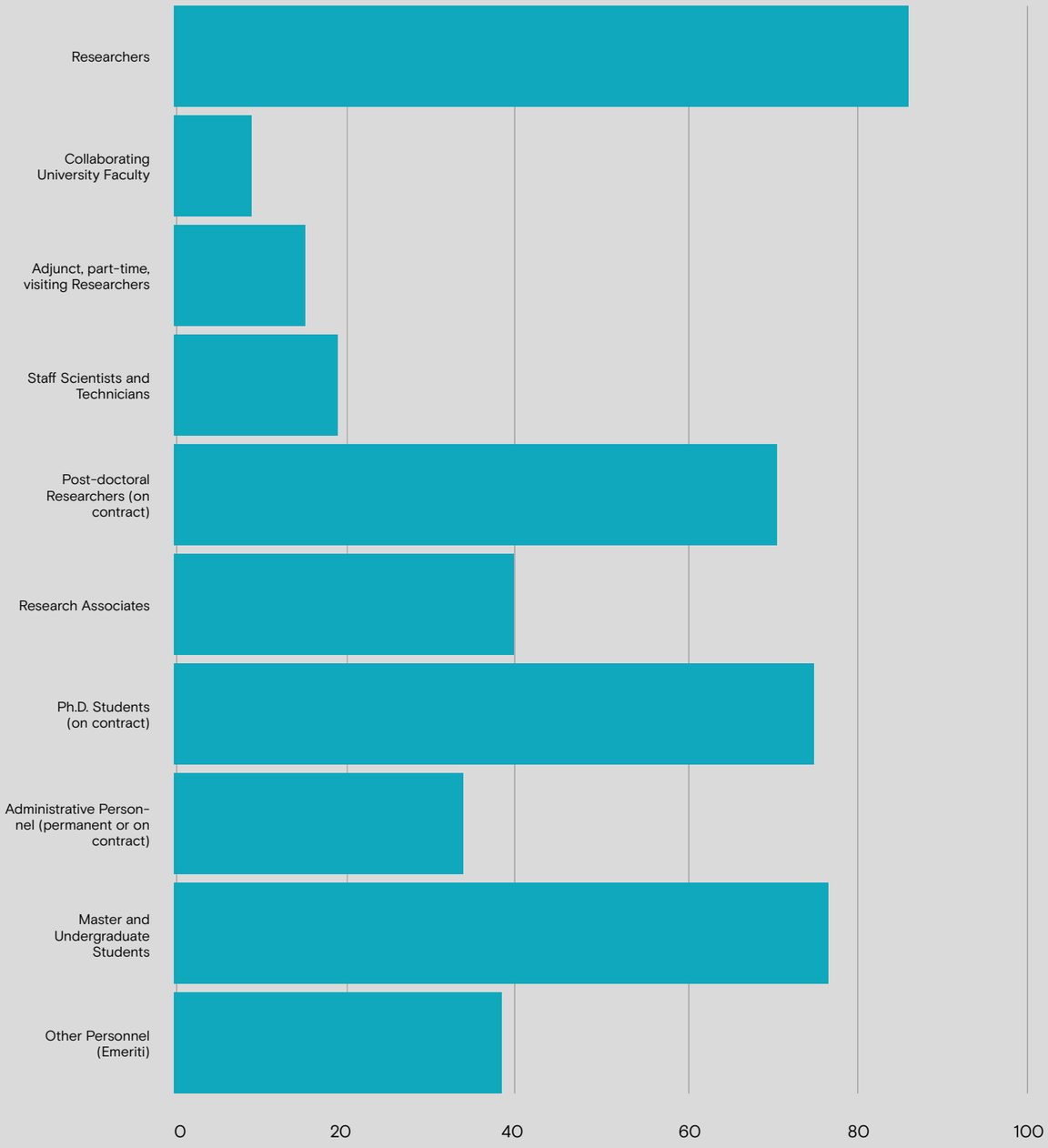
In addition, TPCI/NHRF researchers participate in the teaching of postgraduate courses:

- National and Kapodistrian University of Athens, Department of Chemistry, Postgraduate program "The science of polymers and its applications in the industry"
- National and Kapodistrian University of Athens, Department of Pharmacy, Postgraduate Program "Nanomedicine"

The implementation of the new TPCI/NHRF projects in the framework of the new National Strategic Research Framework 2021-2027 and the EC Horizon Europe Framework Program will provide the opportunity for new research openings, contributing to reduce the “brain drain”.

6. HUMAN RESOURCES

Staff average per category 2020-21

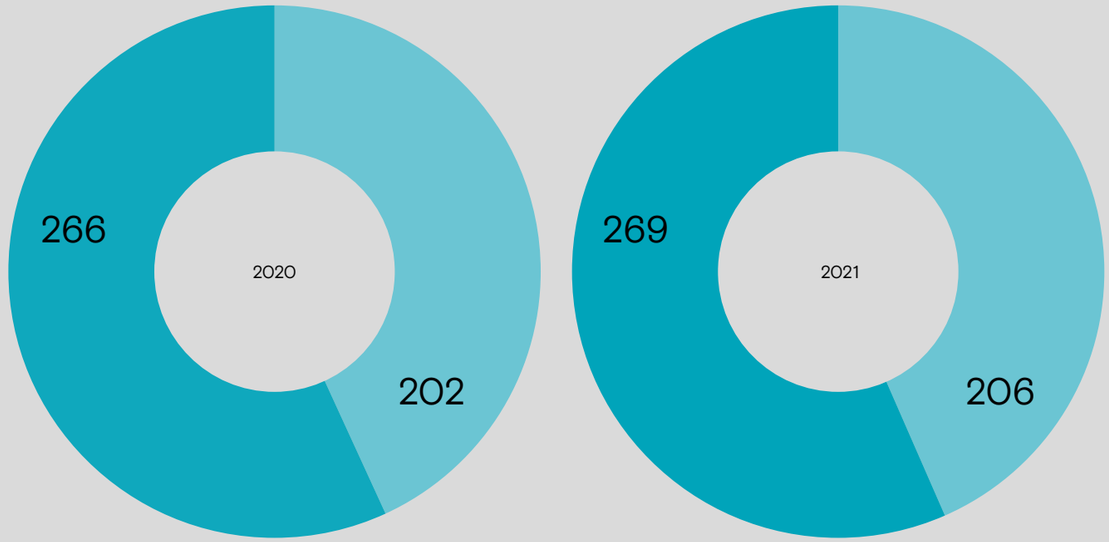


Gender Mainstreaming

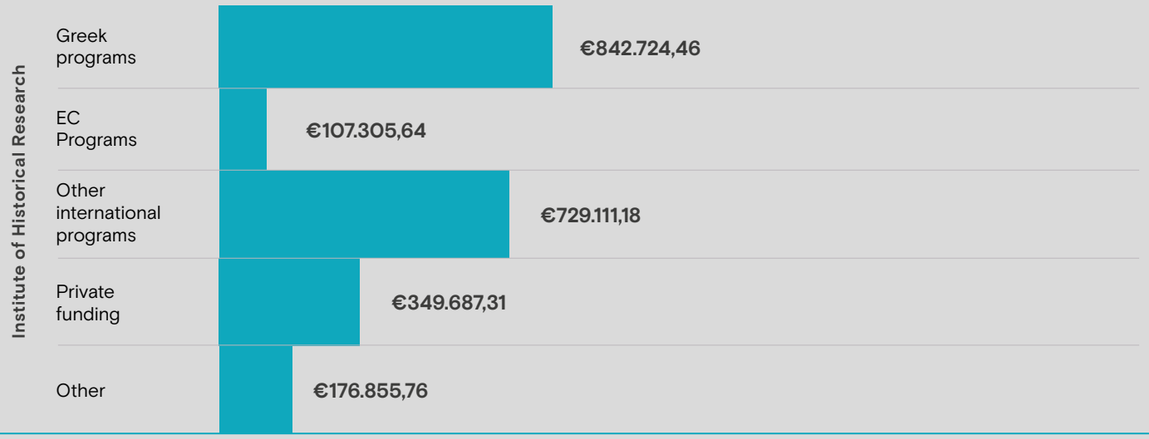
Over the years, NHRF has achieved high rates of gender equality at all levels of staff (research, scientific, administrative, and support), as shown in the graphs below. A key priority, then, is to maintain the high gender mainstreaming rate but also to further strengthen areas where this does not demonstrate satisfactory trends. Within this framework, NHRF focuses on:

- Progress and excellence and excellence regardless of gender
- Maintaining a work-life balance for all employees
- Redefining outdated human resources management policies
- Encouraging women to participate in decision-making processes
- Re-assessing common prejudices and creating an "open" atmosphere.

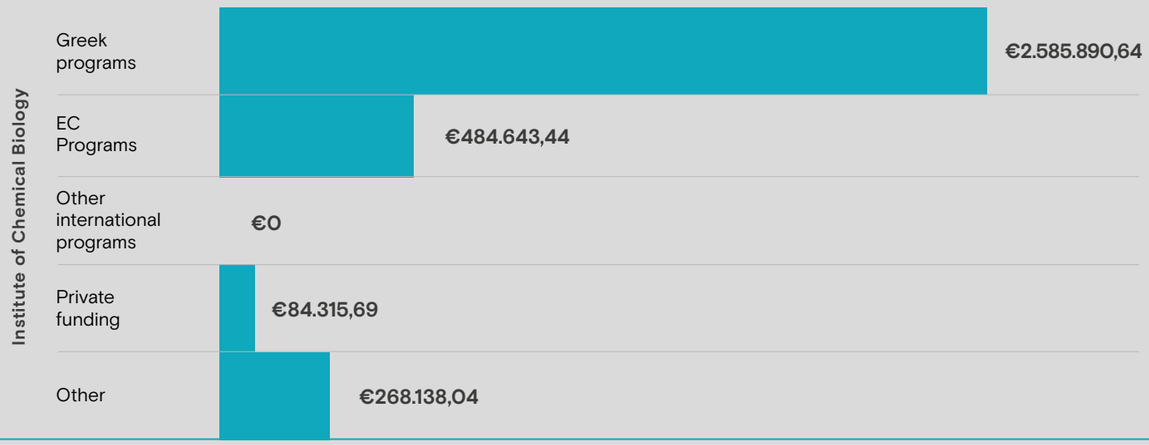
STAFF GENDER DISTRIBUTION 2020-21



7. COMPETITIVE GRANTS



€ 2.205.684,35



€ 3.422.987,81

€ 1.055.341,44

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The Birthdays Design

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