Strategy in the field of *Research - Development - Innovation (R&D&I)* for the period 2025 - 2029 in the "Prof. Dr. Ion Chiricuță" Oncological Institute Cluj-Napoca (IOCN)

1. Vision:

To position IOCN as a center of excellence in basic and translational oncological basic and translational research at national and international level, by promoting innovation and high quality, interdisciplinary, integrative and strategic scientific research.

2. Mission:

The IOCN aims to strengthen its role in the development and integration of basic, translational and clinical research for the prevention, early diagnosis, treatment and personalized monitoring of cancer.

In order to strengthen its role in advanced biomedical research, the Institute of Oncology "Prof. Dr. Ion Chiricuță" Cluj-Napoca (IOCN) aims to develop a competitive research and innovation environment, which ensures a sustainable balance between academic excellence and clinical efficiency. Through this approach, it aims to train a critical mass of highly qualified professionals, oriented towards translational research and technological innovation, able to actively integrate into the European medical ecosystem based on performance, competitiveness and applicability.

The IOCN supports inter- and trans-disciplinary collaboration in cutting-edge, patient-centered scientific research, adaptable to international conceptual and technological progress, in full accordance with the standards and strategic directions of oncology research at global level.

3. Aim, objectives and actions:

3.1 Aim

Strengthening the quality of research at the hospital is achieved through the development of strong partnerships and active involvement at local, national and international levels. Our objective is to maintain our leading position among Romanian university hospitals by harmoniously combining excellence in health care with excellence in scientific activity.

Scientific research is an essential driver of progress and performance, and is also a decisive factor in increasing the visibility of our institution both nationally and internationally. The promotion of a culture of innovation, collaboration and scientific rigor is fundamental for the affirmation of the hospital as a reference center in the medical field.

3.2 Main Strategic Objectives

a. **The strengthening of the research capacity and infrastructure within the IOCN** is an essential pillar in the long-term institutional development, with a direct impact on the quality of medical care and scientific advancement in oncology. By modernizing laboratories, digitalizing research processes, expanding access to state-of-the-art technologies and attracting human resources with advanced expertise, the IOCN aims to become a centre of excellence not only in cancer treatment, but also in medical innovation. Investments in research infrastructure - such as genome sequencing platforms, biobanks, integrated informatics systems, molecular biology laboratories, advanced imaging and translational research - will enable complex, internationally competitive projects focused on personalized medicine, immunotherapy and cancer prevention. In parallel, the aim is to strengthen institutional capacity through continuous training of researchers, attracting young specialists and developing strategic partnerships with universities, research institutes and pharmaceutical companies at home and abroad. These measures will contribute not only to increasing scientific output, but also to improving the IOCN's ability to access European and international funding, to integrate research results into clinical practice and to strengthen its reputation as a national and regional leader in oncology research.

b. Patient-oriented translational research: **the development of patient-oriented translational research at the Institute of Oncology "Prof. Dr. Ion Chiricuță" in Cluj-Napoca (IOCN)** is a fundamental strategic direction for the transformation of scientific results into concrete, personalized and effective clinical solutions. The main goal of this approach is to create a solid bridge between the laboratory and the patient's bedside, accelerating the transfer of biomedical innovations to the direct care of oncology patients. Translational research in IOCN aims at integrating data from molecular biology, immunology, genetics, advanced imaging and artificial intelligence into early diagnosis, risk stratification, choice of targeted therapies and monitoring of treatment response. This type of research is conducted in a multidisciplinary setting, involving close collaboration between clinicians, researchers, bioinformaticians and public health specialists.
Through the development of patient cohorts, the creation of a modern biobank and the exploitation of omics data (genomic, transcriptomic, proteomic), IOCN aims to personalize cancer treatments, reduce associated toxicities and improve patient prognosis. At the same time, translational research contributes to identification of novel biomarkers, validation of innovative therapeutic targets and participation in international early phase clinical trials.
This patient orientation places research in the direct service of real needs in medical practice, with immediate benefits for the quality of life and survival of cancer patients. By reinforcing this direction, the IOCN reaffirms its commitment to precision medicine and to its role as a national and regional leader in patient-centered oncology innovation.

c. **Cancer prevention and early detection at the Institute of Oncology "Prof. Dr. Ion Chiricuță" in Cluj-Napoca (IOCN)** is an essential component of the institutional strategy to reduce cancer incidence and mortality at regional and national level. In a context in which the cancer burden is constantly increasing, prioritizing preventive interventions and early diagnosis is an efficient, sustainable and profoundly patient and public health oriented approach.

IOCN develops and implements organized screening programs for the most common cancers - cervical, breast. These programs include information, counseling, sampling, diagnosis and follow-up of positive cases, with a focus on accessibility, equity and quality of services.

The Institute plays an active role in health education campaigns and the promotion of a healthy lifestyle, focused on reducing modifiable risk factors (smoking, unbalanced diet, sedentary lifestyle, alcohol consumption, etc.) In parallel, it develops digital tools and databases for monitoring target populations and optimizing the patient pathway from suspicion of cancer to confirmation of diagnosis and initiation of treatment.

Prevention research is integrated in national and international projects, with a focus on identifying risk biomarkers, modeling cancer prediction and assessing the impact of public health interventions. In addition, IOCN collaborates with universities, NGOs and local authorities to extend the preventive impact of its actions among vulnerable communities and in rural areas.

Through these efforts, IOCN not only treats cancer, but confronts it in its early stages or even before it occurs, actively contributing to reducing the cancer burden in Romania and asserting its role as a leader in public health oncology at regional level.

d. **The acceleration of innovation through strategic partnerships within the Oncology Institute "Prof. Dr. Ion Chiricuță Ion Chiricuță" in Cluj-Napoca (IOCN)** is a central element in strengthening the institute's position as a national and regional leader in oncology research, precision medicine and the implementation of cutting-edge technologies in patient care.

In an ever-changing medical landscape, with rapid developments in biotechnology, artificial intelligence, genomics and cell therapies, innovation cannot exist in isolation. This is why the IOCN is focusing its efforts on building an ecosystem of dynamic partnerships, bringing together the institution's expertise with the scientific, technological and financial potential of key academic, industrial and public policy players.

The Institute develops partnerships with prestigious universities in the country and abroad, biomedical research institutes, pharmaceutical companies and start-ups in the field of emerging technologies, actively participating in international consortia and European projects (Horizon Europe, EU4Health, Digital Europe, etc.). These collaborations enable rapid access to new diagnostic and treatment platforms, clinical testing of therapeutic innovations and the valorization of research data into concrete, clinically applicable products.

The IOCN also encourages public-private initiatives and supports the creation of interdisciplinary networks that bring together clinicians, researchers, engineers, computer

scientists and health policy experts to develop integrated, personalized and scalable solutions in oncology.

Through these partnerships, knowledge and technology transfer is facilitated, the innovation process is accelerated, and bridges between basic research and medical practice are created. At the same time, collaborations provide essential opportunities for training, attracting funding and increasing international visibility.

By cultivating an open and collaborative environment, the IOCN is committed to the mission of transforming oncology challenges into opportunities for scientific and clinical progress with direct benefits for patients and the health system.

e. **The training and development of human resources within the IOCN** is a fundamental pillar of institutional sustainability and excellence, with the main objective of creating a professional, dynamic and adaptable environment capable of responding to the complex challenges of modern oncology.

In an evolving field, investment in people is essential. The IOCN actively assumes its role as a training center for health professionals - physicians, researchers, nurses, bioinformaticians and other specialists - through an integrated strategy of continuing education, training and professional development.

The Institute offers access to accredited postgraduate training programmes, residencies, clinical traineeships, as well as highly specialized thematic courses in collaboration with prestigious universities and international bodies. Participation in congresses, external mobility grants and involvement in interdisciplinary research projects are also encouraged to stimulate critical thinking, innovation and collaboration.

Human resource development in the IOCN means not only the acquisition of technical knowledge, but also the promotion of an organizational culture based on excellence, empathy, professional ethics and team spirit. Through regular appraisals, constructive feedback and individual career development plans, the institution aims at both employee performance, satisfaction and motivation.

The IOCN also supports the attraction and retention of young talent through mentoring programs, research opportunities, and the development of an attractive professional environment based on meritocracy, recognition and support for innovation.

Through these endeavors, the Institute aims to train not only high-level specialists, but leaders in the field of oncology, able to actively contribute to the progress of medicine, research and health policies in Romania and internationally.

3.3 Actions

a. The orientation of research activity in line with the current level of scientific knowledge on an international scale and with the areas of strategic interest supported by funding - basic research, clinical and applied research - aims to modernize the educational process, the development of innovative protocols and products through technology transfer, and the development of advanced treatments in the context of promoting personalized medicine

b. Reviewing and defining strategic areas of inter- and trans-disciplinary research by formulating innovative research directions and themes, with real potential for development and demonstrable capacity to generate significant scientific results, with both national and international impact, including the possibility of capitalization through intellectual property protection (patents).
c. Disseminate the results obtained in successful competitive projects, in order to promote best practices in research activity and to highlight their scientific, economic and social impact at regional and national level.
d. To explore innovative strategies within the research directions to prevent cancer, improve early diagnosis methods and increase therapeutic efficiency, together with the development and implementation of advanced healthcare models and emerging technologies aimed at promoting individual and collective health and well-being.

4. Priority Research Directions in Oncology

In view of the major public health challenges posed by cancer and the pressing need for innovative solutions, the following research directions are considered as priorities, within a transdisciplinary framework and oriented towards clinical and societal impact:

a. Study of high incidence and high mortality cancers
Priority is given to research on cancers with a major impact on population health, such as breast, lung, colorectal, ovarian and prostate cancers. These pathologies require advanced prevention, early diagnosis, staging and personalized treatment strategies based on sound scientific evidence.
b. Molecular mechanisms of treatment resistance and metastasis biology
Fundamental and applied investigations on the mechanisms of resistance to cancer therapies (chemotherapy, immunotherapy, targeted therapies) and the biological processes involved in metastasis are essential to identify new therapeutic targets and improve patient prognosis.
c. Studying the interaction between the tumor microenvironment and the immune system
A better understanding of the complex relationship between tumor cells and the components of the tumor microenvironment - including the immune system - can lead to significant advances in the development of immunotherapies and strategies to reactivate the anti-tumor immune response.
d. The use of artificial intelligence in oncology diagnostics
Interdisciplinary research integrating artificial intelligence and machine learning into the analysis of histopathological, imaging and omics (genomics, transcriptomics, proteomics) data is supported. The goal is to obtain highly accurate diagnostic and prognostic tools that can support real-time clinical decisions.
e. Ethics, bioinformatics and precision medicine
The development of precision medicine requires not only advanced technological tools, but also a rigorous reflection on the ethical and social implications of using sensitive data. Research in bioinformatics, big data analytics and biomedical ethics are fundamental to ensure a responsible and equitable framework for the implementation of personalized therapies.

5. Strengthening and Developing Human Resources in Research

In order to sustain scientific excellence and increase institutional research capacity, it is essential to continue the professional development of specialized human resources within the Institute of Oncology "Prof. Dr. Ion Chiricuță" Cluj-Napoca (IOCN), through a coherent set of strategic measures aligned with European and national standards:

- Updating the institutional framework regarding the status of research staff, in line with the national legislation in force and with the principles of the European Human Resources Strategy for Researchers - HRS4R (Human Resources Strategy for Researchers), aiming at professional recognition, career stability and skills valorization.
- Develop an institutional human resources policy for research, clearly defining career development paths, the role and responsibilities of researchers on permanent contracts, and support mechanisms for continuous training and career progression.
- Promote the core values of scientific research, such as integrity, independence, fairness, accountability and safety, by applying all HRS4R pillars and reinforcing an organizational culture focused on ethics and excellence.
- Encouraging interdisciplinary teams that bring together diverse expertise, facilitating innovative and complementary approaches in research projects, with impact both in science and in medical practice.
- Continuously update the IOCN's internal rules and procedures, including the methodology for filling research and academic posts, to reflect the principles of open, transparent, merit-based recruitment in line with HRS4R and applicable national legislation.
- Develop and implement a Code of Ethics and Professional Conduct in Research to ensure high standards of scientific conduct and contribute to increasing confidence in research results.
- Stimulating the attraction and employment of fixed-term researchers, including postdoctoral fellows and young researchers, by integrating them into the institution's research nuclei, based on financial resources obtained from grants, national and international projects.
- Attracting researchers with national and international recognition, proven expertise and scientific visibility, in order to strengthen institutional excellence and increase the competitiveness of the research carried out at the IOCN. They may be employed on both fixed-term and permanent contracts, depending on the development strategy and available resources.

6. Evaluation of Research Activity

The evaluation of research activity will be carried out in a coherent and transparent framework, based on two essential components: the publicly verifiable results of the research and the impact generated by the research, both scientific and socio-economic.

6.1 Publicly verifiable results

This component refers to the concrete, documentable and recognized output of the research activity, reflected through:

- Prestigious scientific publications, indexed in relevant international databases (e.g. articles published in ISI-listed journals, mainly in the first two quartiles - Q1 and Q2);
- Scholarly volumes, including authored books, chapters in collective volumes and papers published by academically recognized publishers;
- Patents and other forms of intellectual property protection, demonstrating the potential applicability and originality of research results.

6.2 Impact of research results

Impact assessment involves analyzing how the results obtained influence the scientific, professional and societal environment. This dimension is assessed from two perspectives:

- Impact on basic and applied research, measured by:
  - Number and relevance of citations in the literature;
  - integration of results in subsequent projects or emerging research directions;
- Practical impact, measured by:
  - Technology transfer (patents implemented, products developed, collaborations with industry);
  - Contribution to professional training, through skills development, educational programs and research internships;
  - innovative services to the community (including in the health field);
  - influencing public policy by making evidence-based recommendations and participating in the development of regulations or strategies.

6.3 Guiding principles for evaluation

The research evaluation process will be continuously reviewed and adapted with the following general principles in mind:

- Relevance to science and society - the ability of research to make a significant contribution to the advancement of cancer knowledge and to solving problems of public interest;
- Competitiveness - the level of excellence, originality and international impact of the work carried out;

7. Research infrastructure

- Continue the balanced development of the research infrastructure and leverage it for the benefit of the IOCN research teams, with a focus on priority areas and outstanding results, in order to stimulate national and international collaboration.
- Align investment and widen access to high-performance equipment by establishing clear conditions of use to allow the participation of the largest possible number of researchers within the institution.
- Systematically explore all funding opportunities, from national and European grants to independent sources, in line with EU practice.

8. **Inter- and trans-disciplinary collaboration**

- Intensify collaboration with other universities in Cluj and with public health research institutes in Cluj-Napoca in order to promote inter- and transdisciplinary research.
- To promote inter- and trans-disciplinary collaboration between the internal structures of the university by developing and strengthening strategic research partnerships with other universities in Cluj and with public health research institutes in Cluj-Napoca.
- Stimulating the publication of scientific results in collaboration with international research groups in order to increase the visibility and academic impact of the university.
- To facilitate the attraction and employment of Romanian researchers with expertise acquired in renowned research centers abroad, in order to integrate them into the university's centers of excellence and to strengthen the institutional research capacity.

9. **Funding**

- The current situation (2025) marked by the limited supply of funding through national programs and private contributions constitutes a significant threat to the IOCN's research activity. In this context, it is essential to stimulate access to European and international funding, in the face of increasingly intense competition.
- There is a need to popularize the support services offered by the IOCN's research centres among researchers in order to support their active participation in international competitions and to facilitate the attraction of external funding.
- Efficient organization of project proposal writing activities through: training and coaching of staff in the research facilities in the development of competitive proposals, hiring an increased number of experts in the Research-Development-Innovation Department to provide dedicated support in identifying funding opportunities and in writing project proposals.
- In order to ensure the optimal functioning of the research equipment, a special fund from the IOCN budget will be maintained to cover the annual maintenance costs.

8. Performance Indicators (2025-2029)

Indicator	Target 2029
National/international projects/clinical trials	≥ 30
ISI Q1/Q2 publications	≥ 30
Patents or clinical innovations	≥ 2
Clinical protocols derived from research	≥ 5
Active PhD/Postdocs	≥ 10

9. Management and Implementation

9.1. Development of the Strategic Research Management Unit (SRMU)

In order to strengthen the institutional capacity to effectively coordinate and capitalize on research activity, it is proposed to set up and develop **the Strategic Research Management Unit (SRMU)** within the IOCN. This structure will play a key role in professionalizing, integrating and monitoring research processes, aligned with national and international standards of excellence.

The main objectives of the SRMU are:

- To develop and regularly update the institution's priority research directions, in correlation with international scientific developments and public health policies.
- To support the research teams in project formulation, partner identification and resource integration in order to maximize the efficiency and impact of the results.
- Monitoring national and international calls for funding, providing technical assistance in the preparation of project proposals and managing their administrative aspects.
- Organizing training and mentoring sessions for researchers in key areas such as project proposal writing, grant management, research ethics, dissemination of results, etc.
- Implement mechanisms for continuous evaluation of research impact and support an organizational culture based on results, transparency and quality.
- Facilitate inter-institutional and international partnerships, both academic and industrial, to support applied research and innovation.
- Work with other structures of the institution to ensure the maintenance, modernization and efficient use of existing research equipment and resources.

9.2.Scientific Advisory Board with international experts

In order to align the Oncology Institute's research activity with the highest international standards of scientific excellence, it is proposed to set up a **Scientific Advisory Committee (SAC)** consisting of **recognized international experts** in the fields of oncology, biomedicine, public health, bioinformatics, translational research and other relevant areas.

Main objectives of the SAC:

- Provide high-level scientific advice to define and adjust priority research directions in line with global trends and European policies in oncology.
- Participate in external evaluation processes of the quality and relevance of research projects carried out within the Institute, providing independent recommendations for their improvement.
- Attracting international scientific personalities to the Committee contributes to increasing the visibility and prestige of the IOCN in international research networks.
- Facilitating international cooperation: Identifying opportunities for collaboration, initiating strategic partnerships and promoting the participation of IOCN researchers in European and global consortia.
- Support for human resources policies in research: To advise on the strategy for attracting and developing human resources in research, including attracting young researchers, supporting academic mobility and developing scientific leadership.

Expected benefits:

- Align IOCN research to international standards of quality and competitiveness;
- Increased institutional capacity to attract external funding and participate in major research programs (e.g. Horizon Europe, EU4Health, NIH);
- Promoting an organizational culture based on excellence, transparency and independent evaluation.

9.3 Annual evaluations and scientific and clinical impact reports

To strengthen an organizational culture based on performance, transparency and continuous improvement, a formal mechanism for the **annual assessment of the scientific activity and clinical impact of** the research carried out in the Institute shall be established. These evaluations will be an essential tool for monitoring progress, informing strategic decisions and justifying resource allocation.

Objectives:

- To monitor the quality, relevance and efficiency of research activity at the level of IOCN departments, centers and research teams.
- To assess the scientific (academic visibility, publications, patents, citations, awards) and clinical (implementation of results in medical practice, improvement of patient pathway, innovation in diagnosis or treatment) impact.
- Provide an objective data set for prioritization of funding and development, and to promote individual and institutional performance.

Expected benefits:

- Increased transparency and accountability in research activity;
- Continuous improvement in the scientific quality and clinical impact of the projects carried out;
- Better integration of research activities into the clinical and educational mission of the IOCN;
- Strengthening the institutional capacity to compete for funding and attract international collaborations.

9.4 Quality assurance according to international standards and ISO 9001:2015

To increase confidence in the research activity and institutional competitiveness at national and international level, it is necessary to strengthen a quality management system (QMS) aligned with the requirements of ISO 9001:2015 and international standards of good practice in research