

**National Institute of Geriatrics
Rheumatology and Rehabilitation**

Perspective directions of scientific, development and implementation activities
for the years 2021-2024



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Introduction

The purpose of this document is to analyse designed scientific activities for the years 2021-2023 at the National Geriatrics, Rheumatology and Rehabilitation Institute prof. dr hab. med. Eleonora Reicher (NIGRIR) and estimation of the possibilities for the development of the scientific sphere at the research Institute.

This document is also intended to enable better use scientific capacity of National Institute of Geriatrics, Rheumatology and Rehabilitation and in the coming years will be the basis for the creation of the so-called rolling plans.

National Institute of Geriatrics, Rheumatology and Rehabilitation operates as scientific-research facility in terms of diagnosis and treatment of rheumatic diseases. Researchers from the Institute take part in the work of teams creating international recommendations and implementing them in Poland. The Institute conducts didactic activities- doctoral and postdoctoral proceedings on a extramural form and specialisation course within the Medical Center of Postgraduate Education.

The subject of National Institute of Geriatrics, Rheumatology and Rehabilitations activities is conducting scientific research and development and implementation works, and also participation in the health care system in the following areas: gerontology, geriatrics, rheumatology, medical rehabilitation, orthopaedics and traumatology, of the musculoskeletal system, clinical pharmacology, chronic and dependent diseases, and public health.

Our aim is to conduct scientific research and development work aimed at understanding the pathogenesis of diseases, improving diagnostic and therapeutic methods, analysing the treatment process based on a modern clinical workshop and on this basis creating guidelines and standards for medical procedures, while maintaining the highest quality of activities and patient safety.

The main goal of the NIGRIR research area is to develop new knowledge, methods and tools (know-how) supporting the acquisition and use of resources from basic research on the pathogenesis of rheumatic and geriatric diseases. Considering the dynamically changing leading directions, areas, goals and methods of research in rheumatology, geriatrics and related sciences, as well as changing needs in the field of improving the diagnosis, treatment, safety and organization of rheumatology and geriatrics in Poland, in order to maintain competitiveness and constantly build a position NIGRIR in the country and in the

world, the following priority areas, directions and goals of scientific, development and implementation activities are defined for the years 2021-24:

1. Mission and aims of science in NIGRiR

The mission of the Institute is the motto: "Devoted to passion, ambitious in action - we heal generations". In order to meet the challenges posed by modern medicine at NIGRIR, we place great emphasis on very close cooperation between science and the clinic. Such cooperation helps us to improve the already existing diagnostic methods, as well as in:

- ✓ Gain knowledge about the world and ourselves
- ✓ Meeting the basic human desire - a long and healthy life
- ✓ Implementing and offering modern technologies
- ✓ Developing new diagnostic methods and therapies
- ✓ Personalized medicine
- ✓ Acquiring national and European funds

We also conduct epidemiological studies, the results of which are used in the treatment and prevention of individual and social effects of rheumatic and geriatric diseases. We prepare education standards for medical workers, and we also conduct comprehensive diagnostic imaging.

2. The main aim

Regaining by NIGRIR the full scientific and research potential and efficiency of functioning as well as the position of the institution setting standards in Polish and world rheumatology and geriatrics.

3. Priority thematic areas of scientific research of the NIGRiR Research Departments:

- ✓ Assessment of immunological parameters characterizing patients with rheumatoid arthritis in the phase of undifferentiated arthritis

- ✓ Quantitative and functional disorders of regulatory lymphocytes in patients with rheumatoid arthritis
- ✓ The influence of articular and extra-articular adipose tissue on autoimmune disorders in rheumatoid arthritis
- ✓ Research on synoviocytes of the fibroblastic type and their role in the destruction of joint structures
- ✓ Bone marrow involvement in the initiation and maintenance of chronic inflammation in rheumatoid arthritis
- ✓ Distortions in cytokine production and their impact on the activation of cells from both the immune system and beyond
- ✓ Immune disorders in Sjogren's syndrome
- ✓ Immune disorders in mixed connective tissue disease
- ✓ Histopathological diagnosis
- ✓ Diagnostics of amyloidosis
- ✓ Getting to know the essence of the defect of rheumatic diseases and the issues of correlation between the clinical picture and the genotype of the disease
- ✓ Studies on the functions of microRNA in which impaired expression may lead to changes that initiate the inflammatory process
- ✓ Assessment of the profile of free-circulating and intracellular miRNAs in patients with RA, SLE, MCTD and TU
- ✓ MiRNA: mRNA interaction studies
- ✓ Modulate the balance / differentiation / number of T cells
- ✓ Effect of genetic variants of transcription factors and cytokines on the Treg / Th17 balance
- ✓ Analysis of the function and importance of dendritic cells
- ✓ Assessment of the protein profile in rheumatic patients
- ✓ Personalized medicine – deepening learning about safe and effective therapy based on genetics and epigenetics, and consequently developing new therapeutic strategies for patients with drug resistance / other side effects
- ✓ Development of a method of diagnosing sarcopenia on the basis of a clinical examination, genetic and epigenetic results, functional tests and morphological assessment of aging striated muscles in the course of sarcopenia
- ✓ Screening to detect microRNAs associated with sarcopenia
- ✓ Skeletal muscle research - analysis of gene expression profile, miRNA expression

- ✓ Epidemiological, sociological and statistical studies in the field of aging processes and public health

4. Priority thematic areas of scientific research of the NIGRiR Clinics and Polyclinics

- ✓ Diagnostics and treatment of diseases that affect the deterioration of the health of elderly people with multiple diseases, in particular those with cardiovascular, respiratory, metabolic and gastrointestinal diseases
- ✓ Comprehensive diagnostics of rheumatic diseases in children and the most modern treatment in an outpatient and clinical mode
- ✓ Cooperation with all pediatric rheumatology departments in Poland in the field of developing a scientific base for children under biological treatment
- ✓ Cooperation with all pediatric rheumatology departments in Poland to develop Polish diagnostic and therapeutic standards in rheumatology of developmental age
- ✓ Rheumatological consultations for children's wards from all over Poland
- ✓ Clinical trials of drugs
- ✓ Cardiovascular complications in the course of rheumatic diseases, lipid disorders, diabetes in the course of rheumatoid arthritis
- ✓ Coagulation system in rheumatoid arthritis, ankylosing spondylitis and psoriatic arthritis
- ✓ The role of adipose tissue in the pathogenesis of rheumatoid arthritis, amyloidosis
- ✓ Seronegative spondyloarthropathies
- ✓ Secondary osteoporosis
- ✓ Diagnostics and treatment of chronic, inflammatory autoimmune diseases such as systemic connective tissue diseases: rheumatoid arthritis, systemic lupus erythematosus, systemic sclerosis, polymyositis, mixed connective tissue disease, vasculitis
- ✓ Treatment of rheumatoid arthritis, juvenile idiopathic arthritis (JIA), ankylosing arthritis (AS) and aggressive psoriatic arthritis (psoriatic arthritis) as part of the NHF therapeutic programs - qualification and monitoring of treatment at the NIGRiR Biological Therapy Center

- ✓ Diagnosis of early arthritis and treatment of rheumatoid arthritis, Sjögren's syndrome, spondyloarthropathy
- ✓ Didactic activity for students of the Medical University of Warsaw and doctors specializing in rheumatology and internal diseases as part of courses organized by the Medical Center for Postgraduate Education
- ✓ Surgical treatment of rheumatic patients
- ✓ Diagnosis and treatment (conservative and surgical) of diseases of the spine
- ✓ Rehabilitation Diseases of the spine and spinal cord, inflammatory degenerative diseases of the joints and osteoporosis, rheumatoid nerve damage, robotics in rehabilitation

5. Strategic objectives

The National Institute of Geriatrics, Rheumatology and Rehabilitation wants to serve as a scientific and research center in the field of innovation in the care of the elderly, in the field of rheumatology and rehabilitation. The cooperation of research and development units, medical entities and business will allow in the future to develop and implement new technologies influencing the quality of medical care.

In order to achieve a higher level of scientific research to a degree that allows NIGRIR to obtain a higher scientific category, we conduct activities in the field of:

- increasing the scientific activity of employees in the field of publishing in journals on the A list, Ministry of Science and Higher Education by maintaining support for publishing research results in the most prestigious scientific journals
- introducing an incentive system for scientifically outstanding employees carrying out scientific research (conferences, award bonuses)
- administrative support for employees applying for the degree of doctor, habilitated doctor, professorial titles
- supporting the development of young research workers
- filling the generation gap among the academic staff
- organization of scientific conferences that meet the requirements relevant to the categorization of units

- increasing commitment and efficiency in applying for domestic and international research funding - increasing revenues from research activities
- increasing the degree of internationalization and interdisciplinarity of conducted research
- increasing the mobility of research and teaching workforce
- engaging in research for the needs of business entities
- setting short-term and long-term goals for staff and R&D teams along with accounting for the achievement of these goals
- developing rules for the exchange of scientific ideas within the Institute

Optimisation of quantity and quality of research and development carried out at the national and international level, in particular:

- initiating new research directions at the NIGRiR;
- maintaining existing and establishing new partnerships between strategic units, including industry, technical institutes, universities, Polish Academy of Sciences and foreign entities included in the Academic Ranking of World Universities, mobilizing and supporting research staff in building relationships with foreign centers;
- development of practical aspects of scientific activity (patents, implementations, applications), cooperation (especially within interdisciplinary research teams) and internationalization, understood as participation in international research projects and widely understood commercialization of research;
- applying for grants to domestic and foreign donors - organizational support for employees applying for research funding;
- directing research projects carried out at the Institute on tasks resulting from the country's development strategies;
- acquiring young, talented scientists at the beginning of their scientific career, who will carry out projects at the Institute, prepare implementations, patents;
- participation of employees and teams in European research programs - increasing the mobility of research staff in the field of international contacts, including internships, research projects, conferences;
- active participation in initiatives of local self-government authorities;
- increasing revenues from orders and research performed for external entities;

- dissemination and compliance with the standards of ethics in science and good research practice;

NIGRiR conducts research and development works for the purposes of the state's pro-health policy aimed at improving health, extending life, reducing the incidence of diseases and the scale of disability of the Polish society, as well as disseminating and commercialising the results of scientific research, preparing expert opinions and conducting expert and didactic activities through:

- implementing, based on unique clinical material, innovative research strategies in the field of geriatrics, rheumatology and rehabilitation;
- modernising the scientific base in the field of geriatrics, rheumatology and rehabilitation and related sciences based on human potential, innovative ideas and modern tools;
- setting new directions in pro-health activities of the state and participation in research in the field of early detection, prevention and treatment of diseases, including those related to demographic changes in the society (aging);
- carrying out translational work, i.e. adapting the methods developed by the Institute's research departments in its diagnostic and therapeutic practice;
- commercialisation of solutions developed by scientists employed at the Institute (including through patents and implementations);
- promoting the highest ethical standards in science and the principles of public and social responsibility in research;
- promoting the highest competences of Polish research units in the international arena.

6. NIGRIR relations with the environment

- ✓ knowledge exchange and research coverage;
- ✓ participation of the Institute in the work of national research groups;

- ✓ promoting and strengthening the publishing activity of Rheumatology journal;
- ✓ building a strong brand of the Institute in the field of rheumatology and geriatrics;
- ✓ creating the image and strengthening the position of the Institute;
- ✓ improving the English-language version of the Institute's website along with sending promotional and informational material to foreign units in order to establish cooperation'
- ✓ activation of all units towards creating science-business partnerships for the commercialization of research results (consortia, strategic alliance, clusters, spin-off and spin-out companies, etc.);
- ✓ inclusion of units in the process of developing development strategies - industry, regional, national.

7. Potential sources of funds for research and development

- ✓ The Ministry of Science and Higher Education (MNiSW), which under the Grant for the maintenance of research potential and young scientists (statutory subsidy) covers the costs of the so-called research tasks carried out by employees of the NIGRiR;
- ✓ National Science Center (NCN) financing research projects on the basis of grant competitions;
- ✓ The National Center for Research and Development (NCBR) financing research and development (implementation) projects on the basis of grant competitions;
- ✓ Foundation for Polish Science (FNP) financing research projects on the basis of grant competitions;
- ✓ Donors of scientific works (the so-called basic and applied works), appointed by commercial entities, eg the Polpharm Foundation;
- ✓ Ministry of Health (MZ) as part of project activities, e.g. the National Health Program (NHP);
- ✓ State Treasury - in a situation where the Council of Ministers adopts the so-called contracted project, which will then be entered into the state budget as a long-term scientific activity;
- ✓ Agendas of local government administration, e.g. of the Warsaw City Hall, financing scientific works;

- ✓ The European Commission (EC) under scientific programs, the so-called actions, e.g. Horizon 2020;
- ✓ Foreign donors financing scientific activities, eg from funds for science, eg EEA and Norway Grants

8. Enlargement and optimization of the NIGRiR team of scientists

At NIGRiR, we plan to take steps to optimise scientific work, the effect of which is to be, inter alia, an increase in the number of research workers, including foreign workers. This will allow to increase the percentage share of revenues for science in relation to clinical activity in the next few years.

9. Inventive activities and patents

One of the priority directions of NIGRiR's activities in the recent period is undertaking initiatives and activities aimed at conducting application and implementation research and innovation, which will have a real impact on the quality of life of patients in Poland.

10. Strengths

- ✓ the demographic situation indicates the need for the government and government agencies to establish further research and development projects in the field of geriatrics and gerontology, i.e. the field in which the NIGRiR is a leader;
- ✓ participation in foreign grants;
- ✓ established cooperation with ITE and plans to submit joint implementation applications;
- ✓ Establishing cooperation with the Military University of Technology and preparation of a joint grant, the effect of which is to be a patent;
- ✓ Extension of foreign cooperation, initiated in 2017 with a cycle of short-term internships at the most important research units in the world (will be financed from an application for the restructuring of science);

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Weaknesses:

- ✓ insufficient number of people supporting scientific work at NIGRiR (the Science Department consists of only 3 people, including the director of the science department. In the finance department; no person dedicated to accounting for national and EU projects);
- ✓ no remuneration regulations for employees involved in projects.

Chances:

- ✓ obtaining at least 2 large grants from the National Science Center with direct costs of 40%;
- ✓ obtaining at least 2 large grants from the National Center for Research and Development and, as a result, preparation of implementations and patents;
- ✓ obtaining at least 2 European grants and obtaining a guarantee of reimbursement of own costs, e.g. from the Ministry of Science and Higher Education;
- ✓ obtaining a commissioned project or another large project, e.g. as part of the Gospostrateg competition;
- ✓ increasing the number of employees in basic establishments that can conduct scientific research and apply for grants, and increasing the number of scientific employees and thus increasing the percentage of funds from science in the budget of the NIGRiR.

Threats:

- ✓ in the case of hiring new scientists, they will participate in the statutory subsidy, which is a fixed amount for a year and only in the next year the subsidy will include new hires, but it is not known whether in a proportionate manner, i.e. covering involvement in research topics;

- ✓ loss of one of the key research workers (the so-called scientific engines) and not employing an equally creative researcher in their place;
- ✓ striving to balance the area of science means that the amount for individual research is not sufficient for many scientists (e.g. the amount of reagents), hence the risk of extinguishing the scientific potential and limiting the number of scientific tasks;
- ✓ failure to obtain and / or implement in the years 2021-2024 at least 1 large project of the ordered R&D, e.g. Gospostrateg;
- ✓ failure to obtain and / or implement in the years 2021-2024 at least 2 EU research projects (obtaining national funds for a possible own contribution).