

## **National R&D Institute for Pathology and Biomedical Sciences “Victor Babes”**

Founded in 1887, “Victor Babes” National Institute of Pathology from Bucharest is the first institute of biomedical research in Romania. Still at the forefront of fundamental research, the Institute is today a center of reference for human disease diagnosis and monitoring.

### **Mission**

Victor Babes Institute of Pathology mission is to conduct cutting edge research in the field of molecular and cellular medicine for the knowledge-based scientific progress in the benefit of society.

We are using all organizational resources to address major societal needs in the area of health and to provide scientifically sound instruments and solutions in the benefit of patients and health professionals.

The institute correlates the identified needs at national level with the scientific and health challenges at European level, thus providing the most effective ways of access to state of the art knowledge / solutions and acting as a scientific connection with health and research entities in Europe. The institute provides support for strategic planning and decision at national level for policy makers in the field of biomedical research and healthcare.

The institute’s mission is to expand the knowledge in biomedical and associated sciences by conducting and supporting research, development, education / training and high-quality medical services. The institute’s mission constructively influences the quality of life and healthcare services at national level.

The institute is committed to increase the international visibility of Romanian research in the field of cellular and molecular medicine. Sharing efforts with partner medical institutions (in an attempt to build a local translational research community), the institute is responding with up-to-date solutions to major human health issues in cancer, (neuro)degenerative diseases, immune disorders, nephropathology and cardiovascular diseases.

The institute, organized in three main research departments (pathology, immunology, biology) is using state-of-the-art methodology to develop innovative diagnostic tools and personalized medicine strategies.

The advantage of having infrastructure and experts in different disciplines is that we can adjust our projects along the way, depending on the priorities related to patient needs and in conjunction to the European scientific trends. It is our commitment to be integrated in large scale multidisciplinary projects in biomedical science, aiming at improving health and the quality of life.

### **Research focus:**

Multidisciplinary research in the field of cellular and molecular medicine, developed by 10 research teams:

1. Telocytes: telocytes characterization; telocytes-stem cells tandem; telocytes in regenerative medicine; in vitro and in vivo functional studies on telocytes

2. Surgical and molecular pathology: cell signaling pathways in malignant epithelial tumors; molecular bases of therapy modulation in malignant tumors; genotypic profiles variability in cancer.
3. Translational research in cancer: therapeutic targets in malignant tumors; prognostic and predictive biomarkers in epithelial malignant tumors; molecular identification of etiologic factors in infections and associated tumors.
4. Ultrastructural pathology: basic research in fundamental mechanisms of cardiac regeneration - from stem cell to heart tissue; 3D electron tomography of the caveolar microdomains in smooth muscle cells; cellular and molecular mechanisms involved in glomerular pathology; cell ultrastructure investigation.
5. Proteomic biomarkers: proteomics technologies for biomarkers discovery in cancer; proteomics biomarkers in pharmacological research; proteomics in the evaluation of environmental risks for human health.
6. Immunomodulation-immunodiagnosis: tumor immunology; biomarkers in autoimmune diseases; cytokines and immunomodulation; innovative immunotherapies.
7. Genomics and genetic diagnosis: genetics of neuropsychiatric disorders; genetic/epigenetic and genomic biomarkers relevant for cancer onset and progression.
8. Neurosciences: trophic factor receptors expression in central and peripheral nervous system; tight junction proteins in brain and peripheral nerves; neurodegeneration models relevant to Alzheimer and Parkinson diseases; neuromuscular pathology.
9. Drug development and toxicology: pathologic mechanisms and drug targets in cardiovascular diseases and rheumatoid arthritis; drug development - biological in vitro and in vivo screening; immunotoxicology; radiobiology
10. Assay development and alternative testing: immune-based assay development for bacterial/viral infections; cell-based assays development for drug assessment and nanomedicine.

## **Collaborations**

- **National collaborations** with partners having complementary expertise and infrastructure
- **International collaborations** with Max Planck Institute, Graz University, University of Tuebingen, Universite Catholique de Louvain, Ludwig Cancer Institute, University of Goteborg, University of Turin, University of Medicine Florence, University of Athens, Cyprus Institute of Genetics and Neurology, Center of Cardiovascular Research Aachen, Saint George's University of London, Descartes University of Paris, Hospital Cochin, Chinese Academy of Medical Sciences etc.

## **Project-based research:**

Research excellence in the field of life sciences is sustained by a broad array of research projects:

International projects: 4 bilateral projects with France, China and Cyprus, 1 NATO Science for Peace project, 1 MNT-ERA NET project, 1 FP7 – People project, 1 project in the EU Education and Culture-Lifelong Learning Program.

Research structural funds:

2 POSCCE projects with foreign coordinator (Priority axes 2 – Competitivity by research, technological development and innovation) o

Proteomics technologies for cancer biomarkers discovery (coordinator Prof. S. Constantinescu) o

Implementation of molecular tissue assays for cancer in Romania. State-of-the-art research focused on personalized oncology (coordinator Prof. G. Bussolati)

Projects financed by the national research programs CEEEX (Health, Biotech, Matnantech, Infosoc), CNCSIS, PNII Partnerships and Capacities = 125; 21 projects were coordinated by INCD “Victor Babes” and in 104 projects the institute participated as partner.

Projects financed by the European Social Fund: 3 projects focused on the training of personnel from the national health system in the field of state-of-the-art biomedical techniques, aiming to implement new diagnosis tools in clinical laboratories.

Infrastructure development projects:

- 1) Advanced infrastructure for molecular cytogenetic research;
- 2) Upgrading of a biobank for tumor cells and nucleic acids by attaching an immunogenomics laboratory for molecular screening in cancer;
- 3) Upgrade of research infrastructure for laboratory animals in INCD "Victor Babes";
- 4) Makeup of the most competitive laboratory in Romania for living cell direct study under microscope in an incubator.

Project for defining strategic priorities: “Cell therapy in regenerative medicine development. Strategic priorities” – STRATEC, funded by the National Authority for Scientific Research. Through this project the institute offered its expertise to the main research policy maker in Romania and our researchers gained new insights in the field of cell therapies, paving the way to future research directions.

Major achievements

Publications

Publications in ISI journals with non-zero rAIS = 99

- total rAIS = 154,15918
- rAIS/researcher = 2,03
- total number of citations = 561
- mean citations number/researcher = 7,38

The institute's research activity became significantly more visible at international level during 2008-2011, both as publications and citations number in ISI ranked journals. Considering the number of contributing researchers (76), it is obvious that the objective of the institute's strategy to enhance international visibility was reached.

Publications in ISI journals with zero rAIS = 48 Other publications, 77 papers published in non-ISI journals, 9 books (1 published by Elsevier) and 20 book chapters (7 published by international publishing houses)

Patents: 3 registered patents

- 1) Tetra-sulphonated porphyrin application for producing a dermatologic therapy – photosensitizer;
- 2) Tetrapirolic compound asymmetrically substituted – synthesis and biological evaluation;
- 3) Equipment and procedure for microwave irradiation in in vitro models with concomitant registration of biological behavior in a fluorescence microscope;

3 submitted patents.

The patent “Tetra-sulphonated porphyrin application for producing a dermatologic therapy – photosensitizer” received Gold medal at Brussels Innova 2008, Special Prize of Rudy Demotte, Minister President of the Walloon Government, Gold medal at The 37th International Exhibition of Inventions of Geneva 2009 and Special Prize of the Ministry of Education of Russia, 2009; Gold medal at The International Fair for Innovation, Moscow, 2009.

The project proposals of the Institute at the 2011 Call “Partnerships – Collaborative projects of applied research” reflect our commitment to develop applied research in consortia with other public and private R&D institutions, resulting in patents and publications.

Staff:

- 76 researchers, out of which 21 senior researchers and 19 PhD students,
- along with 39 technicians and 34 NRDS personnel (situation at 15 December 2011), with a mean age of 44 years, represent a critical mass for self-sustaining and further growth in biomedical research<sup>2</sup>