Centre of Fundamental Research and Preventive Strategies in Medicine

RESEARCH AREA
Centre for Fundamental Research and Preventive Strategies in Medicine is based on a development strategy of tools, methods or procedures to ensure visualization, communication and implementation of the research, development and innovation in health, thus to ensure increasing the competitiveness in accordance with the definition of priority domains at both the National Strategy for National Research of Development and Innovation and at European level by compliance with the European Union Programme.

GENERAL OBJECTIVES
- Development of methods and technologies for continuous monitoring of integrative biological systems parameters of human and adaptive mechanisms of the human body at dynamics of biological environmental and psycho-social factors,
- Development of knowledge in preventive or prophylactic domain to ensure both the frame needed to reduce health costs and the quality of life and human performance.

SPECIFIC OBJECTIVES
Research program of the Centre of Fundamental Research and Preventive Strategies in Medicine have specific objectives with strategic role in the priority area represented by health and biomedicine.

- Development of sampling methods and technologies and transmission of information from the patients, including ambulatory and telemedicine.
- The development of modern diagnostic methods, interpretation and integration of data from the patients in the context of history and evolution personalized level.
- Development of modern methods and technologies for cellular evaluation and characterization of biomolecules together with biomolecular interaction analysis.

To achieve these objectives, including facilitating international cooperation for each of them, access to new research projects funded by regional, national or European (ESF, European Research Program FP7 and HORIZON 2020) will be promoted in parallel running to PN II type projects (Ideas and Partnerships) which enable European ongoing development of research infrastructure.

CLASSIFICATION IN THE SUB-PRIORITIES
- Development of modern methods for cellular evaluation and characterization of biomolecules.
- Development of new methods for biomolecular interaction analysis, for biomolecules and toxic compounds detection using biosensors from different matrices (biological fluids, food, environmental samples).
• Organization of conferences, intensive courses for disseminating information on classical and modern methods on detection of various biologically active compounds from different matrices.
• Implement modern and new methods of diagnose for preventive medicine development at national level subordinated to European area of operation.

RESOURCES
Human resources of Centre of Fundamental Research and Preventive Strategies in Medicine consists of teaching staff of the Department of Fundamental, Prophylactic and Clinical Disciplines, Faculty of Medicine, Transilvania University of Brasov, which ensure adequate funding based on a composite indicator of efficiency of research funds and increasing the competitiveness of the educational process, adapting the educational offer to the dynamics of work market by implementing mechanisms to promote and support excellence.

<table>
<thead>
<tr>
<th>Human Resources</th>
<th>Number</th>
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<tbody>
<tr>
<td>Members</td>
<td>16</td>
</tr>
<tr>
<td>PhD Coordinators</td>
<td>3</td>
</tr>
<tr>
<td>PhD students</td>
<td>22</td>
</tr>
</tbody>
</table>

PRIORITY RESEARCH AREAS:
The development of modern methods for cellular evaluation and characterization of biomolecules, for biomolecular interaction analysis and for biomolecules and toxic compounds detection using biosensors from different matrices in order to create a centre for fundamental research that will be involved in preventive strategies in medicine; The diminishing of the existing gap both in the area of fundamental research and preventive strategies in medicine between Universities and R-D institutes in Romania and European Union. Implement modern and new methods of diagnose for preventive medicine development at national level subordinated to European area of operation.

RESEARCH INFRASTRUCTURE:
System of cellular evaluation and characterization of biomolecules:
• Preparation line for histological-pathological evidence,
• Line IHC – IVD.
• Cytogenetic evaluation system for automatic karyotyping and FISH.
Line for biomolecular interactions analysis:

- automatic analyzer flow cytometry CyFlow Cube 8
- Optical equipment for the Surface Plasmon Resonance (SPR) Bionavis 200,
- ELISA system,
- Luminometer,
- Spin Coater,
- Refrigerated centrifuge

RESEARCH DIRECTIONS

Cellular evaluation and characterization of biomolecules in the laboratory of morphology where analyzes will enable accurate diagnosis, interested in a particular pathologic processes and there are especially useful in researching and studying the cellular proliferation, development and prognosis of these tumours. Cario-pattern system for automated cytogenetic and FISH evaluation is a complex system, allows sensitive and accurate diagnosis, with opportunities for scientific innovators. The entire complex detection system provides the smallest structural and ultrastructural changes, which allows analysis and research initiation of pathological processes, especially in the study of neoplasia.

Analysis of biomolecular interactions and interdisciplinary studies in biochemistry-pharmacology-microbiology in order to evaluate the impact of environmental and nutritional factors on human bodies. With SPR Bionavis 200 system the interactions between different molecules and biomolecules can be monitored in real-time and used for biosensors development. Together with CyFlow Cube 8 cytometer the SPR system has in healthcare, microbiology, and industrial applications, like food quality control, as well as plant and animal cytology. Obtaining of thin films on different surfaces can be done with spin coater Spin 150. The thickness of the films can be controlled by varying the rotation speed between 100 and 10,000 RPM. ELISA (enzyme-linked immunosorbent assay) system is used for medical diagnostic tests and in industry for quality control when looking for the presence of a specific protein within a sample. Single-tube luminometer is used for all chemiluminescent and bioluminescent applications.
RESULTS

1. Publications included in Thomson ISI-journals (Web of Science) (selection):

<table>
<thead>
<tr>
<th>Article</th>
<th>Impact Factor</th>
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</thead>
<tbody>
<tr>
<td>Agache, I.O., Ciobanu, C., Persistent High FeNO Phenotype in Asthma <em>Allergy</em>, Vol. 127, Pg: AB4-AB4, 2011</td>
<td>9,273</td>
</tr>
<tr>
<td>Floroian L., Sima F., Florescu M., M. Badea, Popescu A.C., Serban N., Mihailescu</td>
<td>2.733</td>
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### 2. Books and chapters in books (selection)


### 3. Projects

#### International projects (selection)

1. PlantLIBRA (Plant Food Supplements: Level of Intake, Benefit and Risk Assessment) – FP7 Project- Project Coordinator Univ. of Milan, Italy (Prof Dr Patrizia Restani), Coordinator UTBv – Mihaela Badea, 2010-2014.

#### National projects (selection)

1. Precision and sensitivity techniques applied in bio-monitoring network of environmental pollution by polluting factors of development areas south, southeast and central Romania – TIPSARMER- Project PN II Partnership, 72-172/2008 (2008-2011), coordinator Monica Florescu

### Other grants

1. Evaluarea testarii troponinei cu sensibilitate crescuta - high sensitive troponin t (tnt-hs) - roche elecsys - comparativ cu troponina standard pentru diagnosticul precoce al infarctului acut de miocard la pacientii cu sindroame coronariene acute - Contract cu terti ROCHE Romania SRL nr. 17678/16.11.2010 (Alina Pascu)
2. Studiu prospectiv privind poluarea parazitara a solului prin geohelminti datorat prezentei animalelor in spatiul public si repercursiunile lor asupra sanatatii populatiei infantile din Zona Metropolina Brasov- Contract 12628/2010(Codruta Nemet)

International and National Conferences (selection)

3. European experience in the supervision and control of nosocomial infections, Brasov, 2011, 2013. coordinator - Chairperson Codruta Nemet
4. National Congress of History of Medicine - "Transilvania "University of Brasov, Faculty of Medicine, Brasov, 22-25 oct.2011, Chairperson Liliana Rogozea.