

# INTERDISCIPLINARY TRAINING AND RESEARCH PLATFORM

## HIGH PERFORMANCE MULTIFUNCTIONAL POLYMERIC MATERIALS FOR MEDICINE, PHARMACY, MICROELECTRONICS, ENERGY/INFORMATION STORAGE, ENVIRONMENTAL PROTECTION

The Platform aims to develop **training and interdisciplinary research in high-performance multifunctional polymeric materials**. The nucleus of the Platform is based on the **Center of Excellence POLYMERS**, officially accredited by CNCISIS (7.06.2003), center acting within the “Gheorghe Asachi” Technical University of Iasi.

The Platform will be *integrated in national/European networks* and will ensure the *training and improvement of human resources through high education and research*, will *enhance the research performance and the visibility* of Romania, will contribute to *Romanian high education and research integration in European Education Area and European Research Area*, to the *development of the knowledge-based society* and will increase the *socio-economic impact of research*.

To ensure the success of the Project, a set of **specific objectives** has been defined:

- *New educational programmes*, oriented towards *European priorities*, able to ensure highly qualified human resources and to integrate them into the knowledge-based modern society
- *New contents, forms and methods of training*, specific for the development of education and research in multifunctional polymeric materials and in agreement with *Lisbon Agenda* and with *Bologna Process*, as well as with *Romanian priorities*
- Elaboration and implementation of *interdisciplinary programmes of training (master, doctoral, post-doc)*
- *Consolidation of excellence in research* in the field of high performance multifunctional materials by promoting interdisciplinary programmes and by attracting the most talented graduates – from Romania and abroad – for PhD and post-doc studies
- *Extension and consolidation of the research infrastructure (hard equipment)* of the Platform, to improve the training and research process, in order to *increase Platform competitiveness in accessing national (CNCISIS, CEE, PNCDI 2) and international (FP7, NATO, NSF etc.) programmes* and the efficiency in answering the requirements of the regional, national and European economic areas
- *Strengthening the scientific cooperation* with academic and economic partners at national and European level
- *Promoting the exchange of information and communication* between the academic and socio-economic environments, to consolidate the knowledge-based society and to accelerate the integration of Romania into the European Union.

The Project will develop **(i) education activities** through **(i-a) master studies** (two directions are proposed – **Biomaterials** – addressed to graduates of chemistry, chemical engineering, medical bioengineering, biology, medicine, pharmacy – and **Multifunctional Materials for Advanced Technologies**, addressed to graduates of

chemistry, chemical engineering, medical bioengineering, physics, electronics and electrical engineering, civil engineering, environment protection; *both master programmes will be in Romanian and/or English*), **(i-b) doctoral studies** with a pronounced interdisciplinary character and implemented within the “*co-tutelle*” system, **(i-c) post-doc studies** (financed from other programmes), and **(ii) research activities** developed within five programmes, i.e., **(ii-a) Biomaterials. Polymer-drug Systems with Controlled and Targeted Release** (polymer-drug conjugates, diffusional systems, drug inclusion in polymeric micro- or nanoparticles), **(ii-b) Smart Multifunctional Polymeric Materials** (molecular imprinting, diagnostics and bioseparation, nanocapsules and nanostructured membranes *via* core-shell particles, smart hydrogels and nanostructured gels, biomimetic polymeric networks, nanofabrication), **(ii-c) Motile Molecular Systems** (hybrid and organic polymers for biology, microelectronics, nanorobotics and energy/information storage), **(ii-d) Liquid Crystal Hetero-organic and Organic Compounds** (liquid crystals for displays, opto-electronic devices, ferro-electric liquid crystals), **(ii-e) Molecular Modeling and Artificial Intelligence** (conformational analysis and simulation of properties, neuronal networks, fuzzy systems).

All planned activities and actions are based on a **deep analysis of the tendencies in the interdisciplinary education and research**, on the **requirements of the national and European market**.

Most of Platform budget is dedicated to the serious improving of the **research infrastructure (hard equipments)**. *Additional funding and expertise* will be obtained through the facilities offered by the “Gh. Asachi” Technical University of Iasi, the infrastructure and human resources of the POLYMER Centre of Excellence, through the facilities offered by the *traditional national and European partners of the Platform*. **Platform sustainability** will be ensured by different funding attracting activities – *training of specialists from SMSs, consulting activities, national and international grants*, the **RENAR accredited laboratories**, the **Technology Transfer Center** and the **Innovation Relay Centre** established within the Platform, the *specific activities* to be performed within the **Science and Technology Park** in Iasi.

The benefits of the Platform will cover the whole high education and research environment in Iasi and in the North-Eastern Region of Romania and all Platform partners – both academic and economic.

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