

ABSTRACT

***Retea integrata de cercetare pentru constituirea unei platforme tehnologice de biomateriale
avansate, compatibila EuMaT – ADVABIOMAT***

Integrated research network to built an advanced biomaterials technologic platform

Contract no. 54/2006, CEEEX 06, CNMP-Biotech, Module I

Project coordinator CO - Agentia Manageriala pentru Cercetare Stiintifica, Inovare si Transfer Tehnologic – POLITEHNICA, AMCSIT – POLITEHNICA;

Partner P1 - UPB prin Centrul de Cercetare Expertizare Materiale Speciale, UPB – CEMS;

Partner P2 - UPB prin Facultatea de Chimie Aplicata si Stiinta Materialelor, UPB – CASM;

Partner P3 - Institutul National de Cercetare-Dezvoltare pentru Inginerie Electrica, INCDIE ICPE – CA;

Partner P4 – Institutul National de Cercetare-Dezvoltare pentru Fizica si Inginerie Nucleara „Horia Hulubei”, IFIN-HH;

Partner P5 - Institutul de Chimie Fizică “Ilie Murgulescu”, ICF;

Partner P6 - Fundatia Sapientia, Universitatea Sapientia;

Partner P7 – SC R&D Consultanta si Servicii.

Description:

The network of research ADVABIOMAT (<http://ceex.amcsit.ro>, AdvaBioMat) is conceive like an integrated structure of scientific research for the domain of biomaterials, compatible with European Technological Platform for Materials – EuMaT.

Aim:

The network, by component partners, is real implicated in creative activities of scientific research and also in activities of promotion of the research results and of gear other partners by diverse internal or international projects from advanced biomaterial domain.

Objectives:

All research-development activities from the network and the corresponding infrastructure of these activities have been created to response to the following directions of action, defined like specific objectives:

- Projecting, development and the characterization of the advanced biomaterials;
- Modern production, processing and manufacture;
- Testing the biomaterials and the resulted components;
- The Selection and the optimization of the biomaterials;
- Advanced modeling at all levels;
- Data bases and support analytical methods;
- The consideration of the whole life cycle, including the impact on environment, emergence from use, safety in exploitation, risk and recycling.

Expected Results:

All partners from Integrated Network are organized in groups of work, groups of collaboration or executive groups.

The infrastructure of the laboratories, afferent to the partners who are forming the starting nucleus of the Integrated Network of Research – AdvaBioMat, is capable to assure the entire assortment of activities, compatible with declared objectives of the Technological Platform EuMaT:

- The Laboratory of Mechanics of Deformable Media;
- The Laboratory of Testing of Advanced Biomaterials;
- The Laboratory of Advanced Polymeric Materials – analysis and structural characterizations of the advanced polymeric biomaterials;
- The Laboratory of MAGNETRON SPUTTERING deposition;
- The Laboratory of Materials Characterization and Testing for Electrotechnics;
- The Laboratory of quant chemistry and molecular structure.
- The Laboratory of thermodynamics of the gas and condensed systems in pure phase and at equilibrium of the phases
- The Laboratory of the catalysis and surface chemistry
- The Laboratory of electrochemistry and corrosion
- The Laboratory of melted salt
- The Laboratory of oxides materials science
- The Laboratory of colloidal chemistry
- The Laboratory of macromolecular chemistry and inter-phase processes.
- The Laboratory for study the materials biocompatibility:
- The Laboratory of testing the biocompatibility of metallic biomaterials with applications in human medicine
- The Laboratory of obtaining and thermo-mechanical treatment of metallic biomaterials

- The Laboratory of physical-mechanical and structural characterization of biomaterials obtained in the oven with flux of electrons:
- The Laboratory of molecular and cellular biology for tests of biological compatibility
- The Laboratory of biochemistry and enzymology for tests of biological compatibility
- The Laboratory of microbiology
- The Laboratory of chemistry for tests of stability / reactivity of different metallic, ceramic or composite biomaterials
- The Laboratory of physical-chemical analysis

It has been demonstrated the network capacity of the scientific research to generate partnerships and internal or international projects (it has been deposited eight projects for the FP7 program, four of which in quality of coordinator institution. UPB-CEMS and INCDIE-ICPE-CA (Proposal No. REGPOT-2007-2/) has been declared winner.

In the Program PN II-Partnerships it has been deposited six projects with a consortium structure generated by the network nucleus. Three projects have been selected for financing:

1. Bio / Non-bio Interactions implicated in the design of the hard tissues - InTesTa

Contract No. 41-059/September 2007 (CO – UPB-CEMS; P1 – UB-CCBBM; P2 – INCDIE ICPE-CA; P3 – UPB-CASM; P4 – ICF; P5 – R&D; P6 – US-FS; P7 – UO-FIMIM);

2. New advanced biomaterials, nano-structured with titanium base and nontoxic alloying elements - NanoBioTiAll

Contract No. 71-021/September 2007 (CO – UPB-CEMS; P1 – METAV CD; P2 – R&D; P3 – ICF; P4 – UPB-CASM; P5 – UB-CCBBM);

3. Advanced metallic biomaterials, nano-structured, for the orthopedics implants – Biotitanano

Contract will be sign soon in september 2008 (CO – UPB-CEMS; P1 – UT Iasi; P2-INCDFM; P3– R&D; P4– ICF; P5 – UPB-CASM; P6 – UB-CCBBM).

It has been realized connections, which are still in unfurling, between the network and other entities from biomaterials domain, and also between the network and the technological platform EuMaT through national platform EuMaT-Ro.

INCDIE ICPE-CA Bucharest, as a promoter of the European Technological Platform EuMaT from Romania, and member of the Consortium of the ADVABIOMAT project, through National Group EuMaT Ro, has been constant promoted the concept of the Technological Platform

by: work meetings of the Steering Committee, brokerages, workshops organized and popularize by EuMaT.

The most important mandate in the EuMaT was:

- The meeting from 12 December 2006 at Rome - EuMaT Steering Committee Meeting – in conformity with the mandate no. 2802 / 5.12.2006;

- The meeting „*EuMaT Steering Committee*” in conformity with the mandate INCDIE ICPE-CA Bucharest no.1528 / 11.09.2007 during the period 16.09.2007 – 19.09.2007;

- The meeting of the Executive Committee of the European Technological Platform EuMaT - Bilbao (Spain) during the period 06 - 09.01.2008, in conformity with the mandate no. 905 / 08.05.2008.

Elements of novelty

There were identified the existent capacities in the domain of biomaterials realization at national level (until the level corresponding to research, production units or other interested organizations or teams) in purpose to finally obtain an „added value” to the domain of knowledge, concretized by won projects from different programs.

The objectives of general performance of the network are subsidiary to global objectives at the level of 2020 year for the materials and technologies of the Technological Platform EuMat.

It has been practically applied all activities for the constitution of the network nucleus (infrastructure, resources, personnel) and of it connecting to similar networks and finally with EuMat-Ro Technological Platform.

Elements of economical development:

Respecting the rights of the author, the rights of industrial and commercial property, each participant involved in the network projects will benefit of results of product realization, of services and technologies and also of possibility of developing a personal infrastructure.