

BIONANONET NETWORK - one year of activity

The BIONANONET Project no. 68/2002 - MATNANTECH Program, coordinated by the National Institute of R&D in Microtechnologies is one of the many projects following the strategic goal of integration of the national research groups into the 'European Research Area' by the ability a) to join and stir up human resources - mainly youngsters b) to develop intensive and comprehensive electronic communication among professional groups c) to implement the concept of 'collective expertise' into the biomedical engineering research field.

The general objectives of the network are represented by

- the promotion of co-operation between basic and engineering sciences in the biomedical area and implementation of the concept of 'collective expertise' into the biomedical engineering research field
- the support provided for multidisciplinary research on specified area
- preparing students to cross the border between education and modern industrial research with a broad-minded, interdisciplinary fresh approaching.

Its specific objectives are referring to

- evaluation of the existing human and material resources
- strengthening of partner contacts
- dissemination of information and results by electronic and conventional means
- amplifying the impact of various national R&D projects thus ensuring a synergy and creating national and European bridges in the area
- broadening of multidisciplinary information and training of younger researchers, as well as support for researcher mobility
- encouraging the participation in common scientific activities and the transfer of results.

The innovative character of the project is introducing a new way of catalyzing different Romanian competences (micro engineering, physics, biology, chemistry) and institutional frameworks (R&D institutes, Academy centers, universities, professional associations and commercial groups) into a common approach, with a view to integrate the 'science without borders' initiative, according to European science policy. The network points on developing a wide specialized database containing scientific research and technological development projects and trends, information on new approaching and activities, existing facilities and infrastructure in the area.

The main results of BIONANONET activity during 2002 are represented by the joint training and dissemination actions that BIONANONET Project has organized:

- **The Summer School 'Bioactive and Biocompatible Thin Layers'**, holding together four BIONANONET Network partners (**National R&D Institute of Microtechnology, Bucharest, National R&D Institute of Laser, Plasma & Radiation Physics, National R&D Institute of Laser, Plasma & Radiation Physics, National R&D Institute of Chemical Pharmaceutics, Romanian Academy Institute of Macromolecular Chemistry 'Petru Poni' - Iasi**) and two partner institutions belonging to the NANOTECHNET Network - **National R&D Institute of Rare and Non-ferrous Metals, Bucharest and National R&D Institute for Materials Physics and Technology, Magurele**. The common initiative aimed an interactive presentation of basics and specific results in the area of bioactive and biocompatible thin layers for biomedical applications, one of the main topics of the Network.

The Summer School had two sessions daily during three days, the first one dedicated to oral presentations and discussions, followed by the second demonstrative session, held in the specialized laboratories of INFLPR, each session being followed by about 55 fellows, network members and non-members (mainly MS and PhD students in physics, chemistry and electrical engineering).

The topics of the School referred to:

- Ceramics used for biomedical applications** - Claudia Enoiu & Alina Popescu, IMT
- Pulsed Laser Deposition: a novel method to obtain bioactive and biocompatible thin layers** - Ion N. Mihailescu, Carmen Ristoscu, INFLPR Magurele, with demonstrations
- Hydrothermal Synthesis of Biocompatible Ceramic Films** - Roxana M. Piticescu, R.R. Piticescu, INMNR, Bucharest
- Microelectronics Technology Compatibilization for Biomedical Applications** - Ileana Cernica, IMT Bucharest
- Natural Polymers for Biotechnology and Biomedicine Applications** - Georgeta Mocanu, Institute of Macromolecular Chemistry "Petru Poni" Iasi
- Magnetron Spray (HA) and Glow-discharge (DLC) Thin Layer Deposition - with demonstrations**, C. Morosanu, INFLPR Magurele
- Synthetic Hydro gels for Medicine and Pharmacy - 'Polifin' Original Product** - Mihaela Albulescu, ICCF Bucharest
- C and Fe Nanostructures Obtained by Laser Pyrolysis** - Ion Morjan and Ion Voicu, INFLPR Magurele - Ion Morjan and Ion Voicu, INFLPR Magurele, with demonstrations.

- **Self-organizing Systems**, course organized by the Romanian Academy Research Institute for Artificial Intelligence for researchers, engineers and bio-medicine PhD students.

- **The Living Cell - P-systems - computational models of the living cell**, course organized by the **Romanian Academy Institute of Mathematics 'Simion Stoilow', MolCoNet and IMT-Bucharest** in the framework of the **International Workshop on Membrane Computing** - Curtea de Arges, Romania, for professionals in mathematics, informatics, linguistics, biology. The course was held in the framework of the **Workshop on Membrane Computing WMC - CdeA 2002**, held in Curtea de Arges (August 19-23) was the third one in a yearly series started in 2000, with a **Workshop on Multiset Processing WMP - CdeA 2000** and followed by the **Workshop on Membrane Computing WMC - CdeA 2001**.

These workshops aim to gather researchers in membrane computing - an important topic of the BIONANONET Network - from various countries, not only for presenting to each other their recent results in the area, but also for active interaction and co-operation. The meeting was primarily meant to be a place of interaction and a framework of enhancing scientific co-operation, to offer a basis for interdisciplinary discussion.

The workshop has been organized by the **Institute of Mathematics of the Romanian Academy** (member of the BIONANONET Network) and **"Vlaicu Voda' High School** in Curtea de Arges, under the auspices of the **European Molecular Computing Consortium** as a meeting of **Molecular Computing Network**, a project funded by the EU Commission in the FP5-IST and the MATNANTECH Program.

The program committee was composed of Carlos Martin-Vide (Tarragona, Spain), Giancarlo Mauri, MolCoNet coordinator (Milan, Italy), Gheorghe Paun (Bucharest, Romania and Tarragona, Spain), Grzegorz Rozenberg (Leiden, the Netherlands) and Arto Salomaa (Turku, Finland).

41 participants have attended the Workshop from 12 countries (Romania, Spain, Italy, France, the Netherlands, Moldavia, Canada, Germany, Austria, Finland, UK and Hungary). The BIONANONET Network was represented by the **R&D Institute for Micro technology, Bucharest**, the **Institute of Mathematics of the Romanian Academy**, the **Institute of Biology of the Romanian Academy** and the **University of Bucharest**. A number of 29

papers were presented during the oral sessions and in the proceedings volume edited by Gheorghe Paun (Bucharest, Romania and Tarragona, Spain) and Claudio Zandron (Milan, Italy) being published in the Springer Verlag series Lecture Notes in Computer Science.

- **Present and Future in Micro and Nanotechnology for the Neural System** (part I), a course organized by the **Medical Informatics Laboratory Ltd. Satu Mare** for professionals and PhD students in electronics, medicine, biology.

- **Synthesis, chemical modification, specific characterization of polymers for bioengineering**, hands-on-training organized by the **Romanian Academy Institute of Macromolecular Chemistry 'Petru Poni' - Iasi**, for M.S. and PhD students in chemistry and electronics.

- **Micro and Nanotechnology for biomedical applications**, hands-on-training organized by the **National R&D Institute of Microtechnology** for M.S and PhD students and professionals in electronics, physics, chemistry, biochemistry, in the framework of a joint action, with **NANOTECHNET, 3N** and **MINAMATNET** Networks

All these activities proved to be important mainly by the lasting effects they are producing:

- **Dissemination of basic and recent developments of micro and nanotechnology in the field of biomedical research amongst the network partners and different other professional groups**
- **Generation of original contributions held into proceedings and volumes**
- **Emergence of common projects proposals for FP6 and national R&D programs**

