CENOBITE (Centre of Research in Nanobiotechnologies)

Project financed by the National Programme MATNANTECH (2002-2005)

Contact: Prof.Dan Dascalu (dascalu@imt.ro)

CENOBITE

The CEntre of research in naNOBIoTEchnology (CENOBITE) is a "virtual" centre of research at the national level, based upon the strong cooperation and integration of activities of 10 research centres. These centres are active in biology, medicine, pharmacology, chemistry, biochemistry, physics, micro and nanotechnologies. The model used for conceiving CENOBITE is the Excellence Network from the 6th Framework Programme of the European Union, adapted for Romania by taking into account the strategic lines of the European integration. The contractor is IMT-Bucharest. Almost all members of CENOBITE are participants in one or two infrastructure projects (research networks and centre of services) financed by MATNANTECH.

Research fields of CENOBITE:

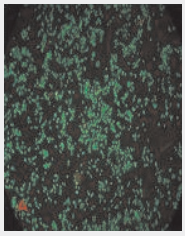
- Lab-on-chips
- Nanoparticles with modified surface
- Advanced drug delivery and other areas of nanosystem and nanoelectronics integration to biological entities
- Electronic detection of biological entities
- Processing, manipulation and detection of biological molecules/entities
- Interfaces to biological entities

Nanobiotechnology Projects Run Inside CENOBITE

The fruitful environment created by the Centre allows to the CENOBITE members to run research projects with subjects on nanobiotechnologies, in the frame of National Programmes MATNANTECH, CERES, etc. Some examples of such ***research projects, at least two CENOBITE members*** *are given below.*

Porous silicon matrix for biomedical applications (2001–2004)

Partners:•IMT-Bucharest•Institute of Biochemistry(Romanian Academy)•National Institute Physics of Materials;



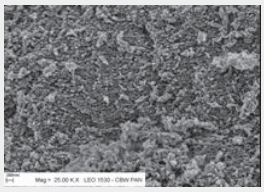
Objectives:

- experiments on porous silicon: by appropriate control of pore size and porosity, and surface treatments, the entire bioactivity spectrum of nanostructured silicon is covered;
- cell culture growth on biocompatible microporous silicon

Contact person: **Anca Angelescu**, **ancaa@imt.ro**

Advanced technologies for the synthesis and processing of biocompatible nanocomposite powders (2003-2005)

Partners: •IMNR-Nanostructured Materials Group •"Petru Poni" Institute of Macromolecular Chemistry (Romanian Academy), Iassy •National Institute for Chemical-Pharmaceutical R&D



Objectives:

- development of non-conventional hydrothermal and ecological technologies for producing nanostructured calcium phosphate/polymers composite powders;
- theoretical and fundamental researches on the inorganic/polymer interactions:kinetics and thermodynamic modeling of processes; study of the biocompatibility of new hybrid nanomaterials; applications in dentistry.

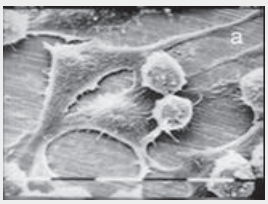
Contact person: **Dr. Roxana Piticescu, roxana@imnr.ro**

List of CENOBITE participants

- Centre of Nanotechnologies (under the aegis of the Romanian Academy) from the National Institute for R&D in Microtechnologies (IMT-Bucharest)
- Centre of Laser-Surface-Plasma Interactions from the National Institute for R&D for Laser, Plasma and Radiation
- Department of Neuro-Psycho-Pharmacology from the Centre of Medical-Military Research (CCSMM)
- Centre of Microstructures and Microsystems for Environmental Monitoring and Biomedical Applications from the National Institute for R&D in Microtechnologies
- Laboratory for Bioactive and Biocompatible Polymers from the "Petru Poni" Institute of Macromolecular Chemistry (Romanian Academy)
- Group of Ceramic Nanocristalline Materials from the Research Institute for Nonferrous and Rare Metals (IMNR)
- Centre for Molecular Biology from the Faculty of Biology, University of Bucharest
- Centre for Cellular and Molecular Pharmacology from the National Institute for Chemical-Pharmaceutical R&D
- Centre for Microbiology from the Institute of Biology (Romanian Academy)
- Centre of Glicobiology from the Institute of Biochemistry (Romanian Academy)

Calcium phosphate multilayers as bioactive coatings for bone implants(2003–2005)

Partners: •National Institute Physics of Materials •National Institute Physics of Lasers, Plasmaand Radiations •National Institute for Chemical-Pharmaceutical R&D •"Petru Poni" Institute of Macromolecular Chemistry(RomanianAcademy), Iassy;



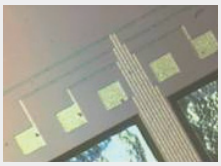
Objectives:

- deposition of calcium phosphates multilayers with applications in biomedicine.The structures are obtained by Pulsed Laser.
- deposition and RF Magnetron Sputtering from pure or doped hydroxyapatite (HA) targets. The structures may be immersed in various biological fluids and cultured with cells.

Contact person: **Prof. Ion Mihailescu, mihailes@ifin.nipne.ro**

Microprobe for stimulation and recording of neural activity (2001-2004)

Partners:•IMT-Bucharest •Centre of Medical-Military Research



Objectives:

- development of an implantable neural microprobe in order to enable the correlation between electrical activity in the human Central nervous system and externally psycho-electrical and chemical stimuli;
- realization of a microprobe experimental test structure for human body implant and for in-vitro cells and tissues electrical recording and study of the compatibility with the electronic circuits.

Contact person: **Dr. Carmen Moldovan, cmoldovan@imt.ro**