Molecular and Biomolecular Physics Department Upgrading
– MDFMOLBIO –

National Plan for Research, Development and Innovation for the period 2007 – 2013 (PN II)

Program: ***Capacities***

Contract Holder: ***National Institute for Research and Development of Isotopic and Molecular Technologies – INCDTIM Cluj-Napoca***

Contract length: ***2010-2012 (completed)***

Project Value: ***30.011.494,75 lei (approx. 6.670.000 euro)***

General objective: ***Upgrading the Department of Molecular and Biomolecular Physics by purchasing a modern research infrastructure.***

Specific objectives:

- **Establish a high performance center in molecular physiscs and technology;**
- **Diversification of research topics, instrumentation and expertise in molecular / biomolecular physics and technology;**
- **The significant improvement of the quality of research and development activities;**
- **Stimulate the technology transfer to the beneficiaries and the establishment of productive entities using innovative technologies**

Research directions:

- **Molecular modeling and numerical simulations:**
  - **molecular design (molecular tailoring);**
- **Molecular synthesis and physico-chemical analysis;**
- **Manufacturing molecular and supramolecular structures:**
  - **molecular recognition;**
  - **self-organization (self-assembling);**
- **Characterization of supramolecular structures;**
- **Development of ultra- high performance applications:**
  - **molecular electronics (conductors, diodes, transistors, logic gates, etc);**
  - **molecular devices (molecular shuttles , motors , tweezers , etc.);**
  - **smart molecular materials;**
  - **molecular systems for drugs transport and controlled drugs release;**
  - **new processing techniques with control at the molecular level.**
- **Processing molecular systems with ultrashort laser pulses (femtoseconds).**

Beneficiaries:

- the scientific community by strengthening the cooperation with specialists from home and abroad;
- MSc, PhD students and young researchers;
- The new infrastructure will be used for training **researchers in Romania**, in accordance with European standards. The purchased equipment are extremely rare in some EU countries and provides premises for participation of the research teams from INCDTIM Cluj- Napoca to large-scale European projects and in particular to the 7th Framework Programme of the European Union
- **The MSc and PhD students** who will use **MDFMOLBIO** infrastructure**.**

Socio-economic impact:

- tighter cooperation with specialists from home and abroad;
- **leading conditions for the specialized training of masters , PhD students and young researchers;**
- to attract graduate young people to scientific research;
- **to stimulate the return of researchers** who activate from abroad;
- **the project will provide the needed infrastructure for our involvement in international research projects.**