

**Search for EU R & D Partner and / or Project Coordinator
by National Institute of Research and Development for Biological Sciences / Department of
Biotechnologies**

The Department of Biotechnologies from the National Institute of Research and Development for Biological Sciences, Bucharest – Romania is searching for a possibility to participate in the **Horizon 2020** project as partner and / or coordinator. Our interest is for following potential projects, and other projects from biotechnology, agronomy and health fields.

Sustainable food security

H2020-SFS-2014-2

SFS-03a-2014: Native and alien pests in agriculture and forestry

SFS-07a-2014: Traditional resources for agricultural diversity and the food chain

SFS-15-2014: Proteins of the future

SFS-19-2014: Sustainable food and nutrition security through evidence based EU agro-food policy

H2020-SFS-2015-2

SFS-02b-2015: Assessing soil-improving cropping systems

SFS-05-2015: Strategies for crop productivity, stability and quality

Innovative, sustainable and inclusive bioeconomy

H2020- ISIB -2014-1

ISIB-12a-2014: Sustainable and resilient agriculture for food and non-food systems

Call for competitive low-carbon energy

H2020-LCE-2014-1

LCE-11-2014: Developing next generation technologies for biofuels and sustainable alternative fuels

Growing a low carbon, resource efficient economy with a sustainable supply of raw materials

H2020-SC5-2014-two-stage

SC5-06-2014: Biodiversity and ecosystem services: drivers of change and causalities

Waste: a resource to recycle, reuse and recover raw materials

H2020-WASTE-2015-two-stage

WASTE-7-2015: Ensuring sustainable use of agricultural waste, co-products and by-products

H2020-WASTE-2014-two-stage

WASTE-2-2014: A systems approach for the reduction, recycling and reuse of food waste

Call for nanotechnologies, advanced materials and production

H2020-NMP-PILOTS-2015

NMP-06-2015: Novel nanomatrices and nanocapsules

PROJECT PARTNER INFORMATION

Organization legal name	National Institute of Research and Development for Biological Sciences
Department	Biotechnologies
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The Department of Biotechnologies is part of the **National Institute of Research and Development for Biological Sciences (NIRDBS)** which promotes fundamental and applicative research.

Currently, by assuming the scientific and technological priorities in the field, the research activity of the Department of Biotechnologies is structured into two complementary directions – *vegetal biotechnologies* and *microbial biotechnologies*. The main activity areas are grouped around central pylons like:

- ✓ exploiting the potential of different plant sources both for phytotherapy, as well as for areas like food and agricultural biotechnologies, environment protection and renewable unconventional energies (biofuels);
- ✓ elaboration of solutions, methods, products and biotechnologies specific for agriculture (phyto-remediation, biologic agriculture);
- ✓ obtaining innovative products based on biologically active compounds from microbial biomass.

The research activities of the department are focused on:

- ✓ the field of *Renewable energies*, where we are looking for obtain of biofuels from plant species that have the capacity to capitalize the reduced fertility of the low productive fields and that are adapted to the climatic potential that shows a continuous change;
- ✓ the field of *Bioremediation*, where we propose the obtaining of biotechnological methods and solutions for the bioremediation of contaminated soils and waters with different wastes;
- ✓ the field of *Agricultural biotechnologies*, where we wish the optimization of *in vitro* multiplication methods for the agro-horticultural plants, the development of methods in view of chemical characterization of the plant extracts, identifying plant species from the spontaneous flora with potential for being used in phyto-remediation;
- ✓ the field of *Microbial biotechnologies*, where we follow both the use of microorganisms in their different conditioning forms, as well as the use of secondary synthesis products with application in the already mentioned fields;
- ✓ the field of *Phytotherapeutic biotechnologies*, where we aim at the encapsulation of some active principles in liposomal architectural structures, in view of preserving their physical-

chemical and phytotherapeutical properties. At the same time, it is envisaged the development of technologies capable of offering intelligent vector type properties, as support for these biologically active compounds;

- ✓ The field of *Molecular Dynamics Simulation* - it aims to study the molecular structure, the evolution analysis of the dynamic and thermodynamic parameters, mechanisms of action and interactions between various biologically active compounds by applying the method of molecular dynamics simulation;
- ✓ The field of *Peptides* - it aims at the isolation of some antimicrobial peptides from natural sources in order to capitalize their therapeutic potential. Also, it is aimed to elucidate the molecular details of their structure and dynamics, as well as to characterize the action mechanisms using molecular dynamics simulation.

RELEVANT PUBLICATIONS / PATENTS / ACHIEVEMENTS

The members of the **BIOTECHNOLOGIES Team** have published within the recent five years 5 books and book chapter and over 45 scientific articles, of which 15 of them are ISI rated, have participated at over 30 communication (oral/posters) of which 20 are international. The most important of them are as follows:

Conference Communications:

- ✓ Steliana RODINO, Alina BUȚU, Marian BUȚU, Petruta Calina CORNEA, *Major compounds and antimicrobial activity of Cynara scolymus and Rosmarinus officinalis against Bacillus subtilis ATCC 6633 strain*, Trends in natural products research: a young scientists meeting of PSE and ÖPhG - A Joint Symposium of the Phytochemical Society of Europe (PSE) and the Austrian Pharmaceutical Society, University Centre Obergurgl, Austria, 21-25 July 2013
- ✓ Steliana RODINO, Marian BUȚU, Marius MICU, Valentina TUDOR, Georgeta TEMOCICO, Andrei IOVA, Alina BUȚU, *Antifungal activity of extracts from three traditional medicinal plants*, European Biotechnology Congress, Slovakia, Bratislava, 16-18 May, 2013;
- ✓ Steliana RODINO, Alina BUȚU, Georgeta FIDLER, Marian BUȚU, Petruta Calina CORNEA, *Investigation of the antimicrobial activity of the extracts obtained from indigenous Xanthium strumarium plants against Phytophthora infestans*, European Biotechnology Congress, Slovakia, Bratislava, 16-18 May, 2013;
- ✓ Steliana RODINO, Marian BUȚU, Valentina TUDOR, Marius Mihai MICU, Elena STOIAN, Ioan Iulian ALECU, Alina BUȚU, *Optimization of the extraction methods for obtaining extracts with antimicrobial activity from Xanthium strumarium and Arctium lappa*, European Biotechnology Congress, Slovakia, Bratislava, 16-18 May, 2013;
- ✓ Steliana RODINO, Iulian GROSU, Carmen MANOLE, Marian BUȚU, Georgeta FIDLER, Alina BUȚU, *Screening of the extraction methods for obtaining some indigenous plant extracts with antifungal activity*, Conference on Integrative Biology in Plants, Microorganisms and the Environment (SysBioLux), Luxemburg, November 2012;
- ✓ Steliana RODINO, Marian BUȚU, Andreea DOBRE, Diana GOLEA, Nicoleta ANDREI, Alina BUȚU, *Testing of the antifungal activity of some indigenous plant extracts*, Conference on Integrative Biology in Plants, Microorganisms and the Environment (SysBioLux), Luxemburg, November 2012;

- ✓ Alina BUȚU, Marian BUȚU, *Microarrays technology and G-quadruplex*, Third International Meeting on G-Quadruplex and G-assembly, Sorrento, Italy, June 28th – July 1st, 2011.

Relevant publications:

- ✓ Monica BUTNARIU, Alina BUȚU, *Functions of collateral metabolites produced by some actinomycetes* in the Microscopy Book Series titled "Microbial pathogens and strategies for combating them: science, technology and education", Ed. Formatex Research Center, Badajoz, Spain, 2013;
- ✓ Alina BUȚU, Marian BUȚU, *Analysis of Proteic Structures*, Ed. Terra Nostra, Iași, Romania, 2013;
- ✓ Alina BUȚU, Steliana RODINO, Mariana FERDES, Marian BUȚU, *Molecular dynamics simulation of seven structures of Viscotoxin*, Digest Journal of Nanomaterials and Biostructures, Vol. 8, No. 1, 1-10, 2013;
- ✓ Alina BUȚU, Catalina TUDORA, Steliana RODINO, Marian BUȚU, *Studies regarding the cultivation of safflower in Southern Romania*, Banat's Journal of Biotechnology, Vol 7, IV(1), 12-17, 2013, *Indexed PROQUEST, CABI, DOAJ, EBSCO, COPE*;
- ✓ Marian BUȚU, Iulian GROSU, Steliana RODINO, Alina BUȚU, *Biodiesel production using calcium-based solid catalysts*, Banat's Journal of Biotechnology, Vol 7, IV(1), 1-11, 2013, *Indexed PROQUEST, CABI, DOAJ, EBSCO, COPE*;
- ✓ Steliana RODINO, Marian BUȚU, Constanta NEGOESCU, *Evaluation of some yeast strains to obtain forage biomass*, Banat's Journal of Biotechnology, Vol V(8), 48-53, 2013, *Indexed PROQUEST, CABI, DOAJ, EBSCO, COPE*;
- ✓ Marian BUȚU, Andreea DOBRE, Steliana RODINO, Alina BUTU, Dumitru LUPULEASA, *Testing of the antifungal effect of extracts of burdock, thyme and rough cocklebur*, Studia Universitatis Vasile Goldis, Seria Stiintele Vietii, vol 23, no. 1, 65-69, 2013, *Indexed SCOPUS, PROQUEST, DOAJ, INDEX COPERNICUS, EBSCO*;
- ✓ Marian BUTU, Diana GOLEA, Steliana RODINO, Alina BUȚU, *Comparative study of the antioxidant activity and of the polyphenolic content for Thymus vulgaris leaves and Pinus sylvestris shoots*, Studia Universitatis Vasile Goldis, Seria Stiintele Vietii, Vol. 23, no. 2, 2013; *Indexed SCOPUS, PROQUEST, DOAJ, INDEX COPERNICUS, EBSCO*;
- ✓ Diana GOLEA, Victor DICULESCU, Adrian ENACHE, Alina BUȚU, Laura TUGULEA, Ana Maria OLIVEIRA BRETT, *Electrochemical Evaluation of dsDNA – Liposomes Interactions*, Digest Journal of Nanomaterials and Biostructures Vol. 7, No. 3, 1333 – 1342, 2012;
- ✓ Diana GOLEA, Victor DICULESCU, Laura TUGULEA, Ana Maria OLIVEIRA BRETT, *Proteasome Inhibitor Anticancer Drug Bortezomib Redox Behaviour at a Glassy Carbon Electrode*, Electroanalysis, Vol. 24, No. 10, 1915–1921, 2012;
- ✓ Diana GOLEA, Steliana RODINO, Alina BUȚU, *A study of the antioxidant effect of flavonic compounds for preventing lipid oxidation by using fluorescence spectroscopy*, Analytical Letters, Vol. 45, No. 14, 2053-2065, 2012;
- ✓ Steliana RODINO, Marian BUȚU, Diana GOLEA, Alina BUȚU, *Fundamentals of isothermal titration calorimetry and some applications*, Banat's Journal of Biotechnology, Vol. 3, Issue 5, p 18-21, May 2012, *Indexed PROQUEST, CABI, DOAJ, EBSCO, COPE*;
- ✓ Diana GOLEA, Marian BUȚU, Steliana RODINO, Alina BUȚU, *Evaluation of antioxidant effect of ribes nigrum and vaccinium myrtillus leaves extracts on lipid oxidation*, Banat's

Journal of Biotechnology, Vol. 3, Issue 5, p 10-17, May 2012, *Indexed PROQUEST, CABI, DOAJ, EBSCO, COPE*;

- ✓ Marian BUȚU, Alina BUȚU, *Molecular dynamics simulation of the Human Alpha-Defensin 5*, Digest Journal of Nanomaterials and Biostructures, Vol 6, No. 3, 907-914, 2011;
- ✓ Steliana RODINO, Marian BUȚU, Diana GOLEA, Alina BUȚU, *Qualitative evaluation of fresh marc-raw material with valuable composition*, Banat's Journal of Biotechnology, Vol. 2, Issue 4, p 18-27, Nov 2011, *Indexed PROQUEST, CABI, DOAJ, EBSCO, COPE*;
- ✓ Carmen MANOLE, Viorica BĂLAN, Cătălina TUDORA, Marian BUȚU, Georgeta FIDLER, Steliana RODINO, Diana GOLEA, Alina BUȚU, *Influence of sucrose concentration on in vitro multiplication of ribes rubrum species*, Banat's Journal of Biotechnology, Vol. 2, Issue 4, p 73-75, Nov 2011, *Indexed PROQUEST, CABI, DOAJ, EBSCO, COPE*;
- ✓ Alina BUȚU, Marian BUȚU, Steliana RODINO, *Studies on the possibility of recovery of secondary products resulting from the process of vinification*, Banat's Journal of Biotechnology, Vol. 2, Issue 3, p 56-63, May 2011, *Indexed PROQUEST, CABI, DOAJ, EBSCO, COPE*;
- ✓ Marian BUȚU, Alina BUȚU, *In silico study of molecular dynamics of human transthyretin variants*, Digest Journal of Nanomaterials & Biostructures, Vol. 6, No. 2, p 879-887, 2011, *Indexed PROQUEST, CABI, DOAJ, EBSCO, COPE*;
- ✓ Marian BUȚU, Alina BUȚU, *Application of molecular dynamics simulations method for peptide IED3*, Banat's Journal of Biotechnology, Vol. 1, Issue 2, p 21-26, 2010, *Indexed PROQUEST, CABI, DOAJ, EBSCO, COPE*;
- ✓ Marian BUȚU, Alina BUȚU, *CAP. III Methods of protein analysis*, in BIOINFORMATICS Vol II, Ed. Tehnica, pag. 20-38, 2008.

Patents:

- ✓ Marian BUȚU, Alina BUȚU, *Bioinformatic system for obtaining molecular dynamics trajectories of proteic sequences*, S2011 0161/ 5.10.2011;
- ✓ Catalina TUDORA et all, *Enviromental stimulation process plant using simultaneous acoustic and laser radiation fields*, – patent application no: A/01284/30.11.2011;
- ✓ Marian BUȚU, Alina BUȚU, *Bioinformatic system for obtaining molecular dynamics trajectories of proteic sequences*, A/01055 / 5.11.2010;
- ✓ Alina BUȚU et all, *Method of warning on the risk of appearance and spread of pathogens carried by wild birds in agriculture*, A/00968 / 13.10.2010;
- ✓ Alina BUȚU, Marian BUȚU, *Analysis method for the conformation of proteic sequences*, A/01054 /5.11.2010;
- ✓ Alina BUȚU et all, *Specific biological markers from hemolipha composition applied in bees health monitoring*, A/01005 / 2.10.2010;
- ✓ Alina BUȚU et all, HEPROVIT – phitotherapeutic product for veterinary use, patent 122438/ 30.06.2009.

Prises and distinctions:

- ✓ Bronze Medal: *Biological Markers* at PROINVENT 9th Edition, Cluj-Napoca, RO, March 22-25, 2011;
- ✓ Diploma of Excellence and bronze medal for *Coccinonet* at PROINVENT 9th edition, Cluj-Napoca, Romania, March 22-25, 2011;

- ✓ Special prize of Republic of Moldova, INNOVA, Brussels, Belgium, November 18 – 20, 2010;
- ✓ First prize and gold medal at INNOVA, Brussels, Belgium, November 18 – 20, 2010;
- ✓ First prize and gold medal at INVENTIKA, Bucharest, ROMANIA, October 6 – 9, 2010;
- ✓ Second prize and silver medal at EUREKA, Brusseles, Belgium, November 16, 2003;

RESEARCH PROJECTS (within the recent five years)

The **Biotechnologies Team** has a vast experience in realizing and also directing national and international projects, being involved within the recent five years in over 20 projects of which 5 are international.

PNCDI II

- ✓ Contr. PNII-PCCA 106/2012, *New formulas used for control and treatment of oomycetes fungal diseases in horticulture crops*, 2012-2015;
- ✓ Contr. PN II - CNMP 62-056/01.10.2008, *Bioinformatics system for protein conformation analysis*, 2008-2010;
- ✓ Contr. PN II - CNMP 52-136/01.10.2008, *Research on acoustic and laser radiation field use on ecological non-stressing plant stimulation*, 2008-2010;
- ✓ Contr. PN II P4 BIOTECH 51-087/18.10.2007, *Bee family health surveillance by complex diagnose exams from hemolifatic probe and diet and metabolic profile optimization, correlated with immune status growing of Apis mellifera*, 2007-2010;
- ✓ Contr. PN II P4 31-084/18.10.2007, *Determining vulnerability to the danger of the spread of harmful agents by birds in Nature 2000 areas*, 2007-2010;
- ✓ Contr. PN II P4 INFOSOC 11-056/18.10.2007, *Simulation of Membrane Systems Cells*, 2007-2010.

CORE PROGRAMME BIOSTAR:

- ✓ Contr. PN 09-360104, BIODIV - *New approaches in analysis and characterization of plant biology phenomena and their applications*, 2009-2011;
- ✓ Contr. PN 06-400104/06.02.2008, *Molecular dynamics simulation for peptides*, 2008.

Other EU and international projects:

- ✓ Contr. MIS ETC 146, *Biofuels – source of common sustainable development in the cross-border cooperation area*, 2011-2013.
- ✓ Contr. MIS ETC 656, *MedPlaNet - medical plant network for enhancement of the comparative advantage of Calarasi – Silistra cross-border area for sustainable development*, 2010-2012;
- ✓ COST MP0802, *Self-assembled Guanosine Structures for Molecular Electronic Devices*, 2009-2012;
- ✓ Contr. MSC, London, UK 2461/28.06.2008, *Analysis of thermodynamical parameters in MDS protein*, 2008-2009;
- ✓ Contr. COMTELDATA, Canada 2916/15.09.2008, *Analysing of protein aggregation using statistical mechanics methods*, 2008-2009;