

Institute of Molecular Genetics and Genetic Engineering

Laboratory for Molecular Microbial Genetics and Ecology

Scientific field (Frascati Manual)

Environmental biotechnology

Bioprocessing technologies (industrial processes relying on biological agents to drive the process) biocatalysis, fermentation

Bioproducts (products that are manufactured using biological material as feedstock) biomaterials, bioplastics, biofuels, bioderived bulk and fine chemicals, bio-derived novel materials

Biomaterials (as related to medical implants, devices, sensors)

Other natural sciences

Brief description of expertise

- The core expertise of our group is microbial molecular biology and ecology which we apply to a wide range of areas - Our research is interface of chemical and medicinal biotechnology - we have unique collection of *Streptomyces* and other soil actinomycetes and we continue our bioprospecting activities in search for novel bioactive microbial compounds and biotechnologically relevant enzymes - Biotechnology (offering sustainable and greener solutions to synthesis of valuable molecules and biomaterials including waste conversion to value-added materials) - Biocatalysis (discovery and engineering of novel biocatalysts for the production of chiral molecules, and improvement of biocatalytic processes) - Bioremediations (aromatic hydrocarbons, heavy metals...) and biodeteriorations (cultural heritage, paintings, books...) - Production and characterization of bioactive compounds (*Streptomyces* culture collection) - Novel approaches in antimicrobial treatments (microbial communication modulating molecules; virulence modulating agents; host-pathogen interactions; activity against microbial biofilms; antifungal therapy) - Taxonomic assessment of microbial communities using metagenomic approaches and taxonomic identification of bacterial isolates through 16S sequence analysis

Keywords

Microbiology , Biotechnology , Molecular Genetics, Biocatalysis, Bioremediations , Bacterial Secondary Metabolites , Biopolymers , Biofuels , Microbial diversity, Ecology

Commercial services

- Microbiological analysis of various samples (counts and taxonomic assessment) - Taxonomic identification of individual microbial isolates - Analysis and characterization of bioactive properties of new molecules (antimicrobial screens, in vitro cytotoxicity testing, quorum sensing, biofilms) - Assessment of embryotoxicity of compounds (zebrafish system) - Directed evolution of enzymes - PCR and sequencing - Analysis of biodegradability of novel materials - Training

Realized and current projects

A) NATIONAL PROJECTS

Title	Project ID	Funding source	Duration
Microbial diversity study and characterization of beneficial environmental microorganisms	173048	Ministry of Education, Science and Technological Development	2011-2015

Title	Project ID	Funding source	Duration
Expression and regulation of pharmaceutically important genes in microorganisms	143056	Ministry of Science and Environmental Protection	2006-2010

B) INTERNATIONAL PROJECTS

Title	Project ID	Funding source	Duration
Structure-function studies of 16S rRNA methyltransferases: the basis of aminoglycoside antibiotic resistance and enzyme translational autoregulation		Wellcome Trust	2006-2008
Search for new bioactive secondary metabolites		Cooperation Between the Academy of Sciences of the Czech Republic and the Serbian Academy of Sciences and Arts	2006-
Microbial diversity in the copper mine Bor	CRP/YUG09-03	ICGEB	2010-2012
Assessing and Monitoring Microbial Communities and their Impact on Documentary Heritage in Collection of National Library of Serbia – Preserving the Memory of the World (AMARCORD)	Request number: 6651419001 SRB No. 590-2/2012	UNESCO	2012
Functionalisation of bacterial polymers	BP2013	Bioplastech Ltd., Dublin, Ireland	2013-
Systems Biocatalysis (SysBiocat)	COST Action CM1303	COST	2014-

Industry group (according to "Gazette RS", No. 54/10)

Manufacture of basic chemicals, fertilisers and nitrogen compounds, plastics and synthetic rubber in primary forms
Manufacture of pesticides and other agrochemical products

Manufacture of other chemical products

Manufacture of basic pharmaceutical products

Manufacture of plastic products

Manufacture of medical and dental instruments and supplies

Research and experimental development on natural sciences and engineering