

Molecular Bank

Molecular bank

Molecular bank of Iranian Biological Resource Center possess a unique and valuable collections of all organism's genetic materials from national resources and from prestigious cell line collection centers around the world as well as providing of cutting-edge molecular identification services.

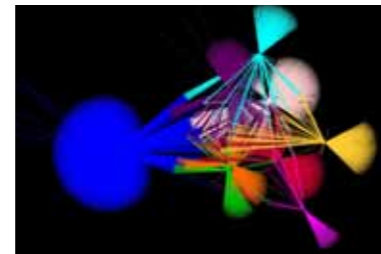
SERVICES

- DNA extraction from all biological samples
- Ribotyping of Bacteria, Archaea, fungi and yeasts
- Phylogenetic analysis of plants using ITS and ETS markers
- Molecular classification of plants and animals using SSR markers
- DNA barcoding of animals using COI
- Cloning of functional genes in desired vectors of prokaryotic and eukaryotic hosts in order to check the gene expression and gene transfer
- Bioinformatic analysis of molecular phylogeny data based on MP, ML and BI methods using PAUP, MrBayes softwares
- Advanced bioinformatic analysis of NGS generated high throughput data associated with genome sequencing and annotation, metagenome and transcriptome analysis projects



MAIN PROJECTS

Quantitative analysis of microbial communities using metagenomic analysis based on the NGS techniques such as Iran hot springs, wetlands and seas as well as other related microbial communities such as Biofuel, fermented foods, animal nutrition etc. related important microbial communities.



DNA collections

Deposited genetic material collections

DNA bank

- Microorganisms genomic DNA
- Human & animals genomic DNA
- Plant genomic DNA

Libraries

- DNA
- cDNA

Oligonucleotides

- Primers
- Markers
- Probes

Vector bank

- Plant transformation vectors
- Mammalian expression vectors
- Bacterial expression vectors
- Yeast and Fungi expression vectors
- Baculovirus Expression Vector system
- Subcloning and transcription vectors
- Hosts



Laboratories

- Molecular biology core lab
- Genetic engineering and recombinant protein lab
- DNA bank
- Metagenomics lab



Plant Bank

SERVICES

- Evaluation of the antioxidant activities (DPPH, FRAP, POD, CAT, SOD)
- Total phenol, flavonoid, protein analyses
- Phytochemical analysis with RP-HPLC
- PAGE and SDS-PAGE Electrophoresis
- Zymogram
- Plant scientific name determination
- Mitosis and meiosis spread preparation
- Diverse range of molecular analyses
- In vitro conservation (short-term, medium-term and long-term conservation) of disease free plantlets
- Providing different kinds of plant materials (seed, living plant, essential oil and extract)
- Micropropagation of different plant species
- Exchange of in vitro germplasm with other organizations
- Research service facilities



Laboratories

- Cytogenetics Lab
- Molecular Lab
- Phytochemical Lab
- Plant tissue culture and cryopreservation lab.
- seed lab



Plant Bank

Plant bank of Iranian Biological Resource Center with around 9200 seed materials owns one of the largest seed collections of Iran. Beside this collection, it also includes living collection, herbarium collection, and in vitro collection of mostly indigenous Iranian species. Samples of all three last collections have been collected by the experts of the Bank referring to the natural habitats. All the materials are maintained and living material are grown under optimized conditions. Phytochemical, Molecular, and Cytological analyses would be carried out on the distinct materials in order to achieving taxonomical, medicinal or breeding purposes.

MAIN PROJECTS

Our main purpose is development of optimized techniques for plant germplasm banking. In this direction, we tried to set tissue culture techniques for many species especially ornamental and endangered plants. Many laboratory methods such as molecular and cytological procedures used here for precise name determination and documentation. Ascertaining all of the needed condition for preserving and regenerating of our germplasm would be provided in the result of the keen examinations. Phytochemical analyses are other part of our main research activities, the results could be also used in documentation and taxonomy, but we also hope the results lead to medicinal products.



IRANIAN BIOLOGICAL RESOURCE CENTER

Plant collections

Essential oil and extract bank:

- With around 1200 specimens, we have the best Iranian bank of essential oils and plant extracts

Seed and living collections

- With about 9200 seed samples, our seed collection is one of the largest in Iran
- Moreover, we are maintaining 850 accessions as living collections. These include a high diversity of bulbous and rhizomatous plants with medicinal or ornamental applications

Herbarium

- There are around 8000 herbarium sheets in the herbarium. More than 4000 sheets identified and documented. Important to mention, each herbarium sheet is mostly supported by seed or living material

In vitro collection

- More than 50 different plant species are conserved at in vitro condition
- over 25 commercial protocols successfully were established and more than 40,000 services were given to people



Introduction

Paying attention to everincreasing of world population in recent decades will lead to the sustainable development of preparation of sufficient food and natural resources like water, soil and weather as well as biological resources which is one of the greatest challenges, has been faced by human community. Because of the great importance of biological resources in life science and the great treasure of biodiversity in Iran, accordingly the supreme leader of I.R Iran, endorsed the establishment of Iranian Biological resource center in 2008, under the authority of Academic center for Education Culture and Research (ACECR).

Main goal of this center is improving of national researches for collection, preservation and studying of biological resources, so, in addition to supporting of the biological resource centers of the country as well as establishing of national network of biological resources, this center will endeavor to be pioneer center for collection, completion, organization, standardization and preservation of biological resources to enhance the life quality and hygiene as well as the food safety.

Department of Training

Because biology will continue into the 21st century as a major frontier of science, students should understand biology, not only for its own sake, but because of the need to take informed positions on some of the practical and ethical implications of humankind's capacity to tinker with the fundamental nature of biology". The rapid change in science of biology is creating opportunities for education. It is important that this education help students understand the need to obtain information from more than one technique to solve a problem. Consequently, to perform more complicated of this task, we designed more than 113 different short term training courses and nearly 4000 students are educated till now.



Department of Research

The department of research in Iranian biological resource center (IBRC) performs the executive and consulting activities to develop the research in biological sciences and genetic resources. The office of research monitors the international and national projects that are defined in the plants, microorganisms, molecular and cell banks. Research and development of the bank is supervised by the department as well. At the moment More than 40 Researcher and PhDs make us an active research collection.

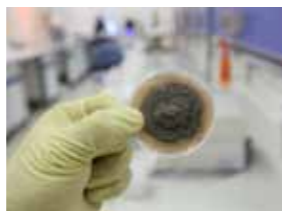
Activities:

1. preparation and management of research programs and projects in research field with considering demands and priorities and offering them to the scientific and technical deputy
2. holding conferences and scientific symposiums
3. making effort to remove research related issues of faculty members, students and lab.
4. Drawing research project contract
5. following up fulfilment of research projects.
6. evaluation of research projects
7. criticism and theory affairs and science production
8. establishment of science and research databases to facilitate and speed up research
9. preparation of annual and seasonal reports to monitor the achievements
10. projects, plans and graduate thesis projects are consulted and advised by the department of research



Department of Specialty Services

IBRC Specialty Services brings years of knowledge, experience, process development, and project management to our customers to ensure the best possible biotechnological products and services for any application in science and industry. As biotechnology development goals in the modern industry have evolved, IBRC has risen to the challenge to effectively meet those requirements. Not only academic scientists and students can use the state of the art technology in all biological assays but also industrial technicians, experts and those who concern about the quality take advantage of high quality products and services. For getting more depth details and finding what solution we are providing for every specific need, you can get in touch with us via our website or request us by sending an email: www.ibrc.ir, email: service@ibrc.ir



Iranian biological resource network (IBRN)

Given the importance of biological resources as a basis for research in biology and biotech as well as attaining the objectives of the 20-year vision of Iran (taking the region's first place in sciences and technology), the Iranian Biological Resources Network was established in 2010 by the Iranian Biological Resource Center (IBRC) under the supervision of Iran's Biotech Development Committee. Iranian Biological Resources Network consists of a series of biological and genetic resource centers formed with the aim of creating a comprehensive information network, management and coordination of the country's biological and genetic resources in order to meet the research needs of research centers and researchers.

21 centers and organizations have become a member of this network so far and the information on more than 11000 biological samples are available in the website of the network (www.ibrn.ir)

Main achievements

- Designing and setting up the Iranian biological resource network at www.ibrn.ir;
- Membership in World Federation for Culture Collections (WFCC);
- Iran's membership in International Committee on Systematics of Prokaryotes;
- Signing four academic and International Memorandums of Understanding with the University of Valencia and Industrial Yeasts Collection of the University of Perugia, Italy, Erasmus University Medical Center Rotterdam and University of Tsukuba plus 34 Memorandum of Understanding with Iran's academic and research centers;
- Negotiating and reclaiming about 7200 Iranian seed samples available in foreign banks which had been brought out of Iran (to Australia, Germany, Sweden, Thailand, Taiwan, China, Colombia and The Philippines). It is to be mentioned that some of these valuable samples no longer exist in the country and they are only preserved in the Center;
- Setting up the first Iranian bank of essential oils and extracts;
- Detecting and recording 30 taxa as indigenous microorganisms of Iran;
- Storing nearly 30000 biological samples in 27 collection
- Launching human and animal cell bank, molecular biology department, microorganisms bank and plant bank;
- Above all, this center intend for globalization, enabling policy multi-stakeholders collaboration

Human and animal cell bank

Services

- Cell line service
- Establishment and immortalization of fibroblast, epithelial and mesenchymal cell strains from normal and malignant human tissues and normal animal tissues
- Sterility testing including mycoplasma, fungal and bacterial contamination detection
- Establishment of immortal lymphoblastoid human cells transformed by Epstein-Barr virus (EBV)
- Cell line validation testing
- Authentication of human cell lines
- Characterization of mesenchymal stem cells
- Species identification of cell lines
- MTT and XTT cytotoxicity assays
- Comet genotoxicity assay
- Real time PCR services for gene expression analysis
- Primer design service
- DNA and RNA extraction from human and animal biological samples
- DNA and RNA extraction from cell lines
- Genetic manipulations of cell lines
- Apoptosis detection using AnV-FITC and Epoptosis 7-AA
- Human 16s STR identity testing using Gene Analyzer
- Cell culture media and supplements
- Safe deposits
- Consultation services

Laboratories

- Molecular biology lab
- Quarantine cell culture lab
- Propagation cell culture lab
- Real time PCR lab
- Biochemistry lab
- Microbial quality control lab
- Immortalization cell culture lab
- Preparation lab
- Training cell culture lab
- Cell storage room
- Washing and sterilization service room



Cell collections

- Standard research cell lines
- Mesenchymal stem cell collection
- Oral cells collection
- Iranian population Random Collection
- Normal Human B Lymphoblastoid cell collection
- Diseased human cell collection
- Breast cancer cell lines panel
- Cell line collection applied for biotechnology including expression systems (Host and packaging) and Serum free cell lines
- Animal Fibroblast Cell Collections:
- Fibroblast cells of domestic animals in danger of extinction:
 - Bacterian camel skin fibroblast cell collection
 - Golpayegani cattle skin fibroblast cell collection
 - Caspian horse skin fibroblast cell collection
 - Sistani cattle skin fibroblast cell collection
 - Markhoz goat skin fibroblast cell collection
 - Moghani sheep skin fibroblast cell collection
- Wild endangered animals cells
 - This collection includes Persian leopard skin fibroblast and Caspian salmon Fin cells
- Laboratory animals cells
 - Including fibroblast cells established from rat, mouse and rabbit
- Miscellaneous domestic animals cells
 - This collection includes various fibroblast cells such as dog, sheep, etc.



Human and animal cell bank
Human and animal cell bank of Iranian Biological Resource Center has a valuable collection of human and animal primary and continuous cell lines from national resources and from prestigious cell line collection centers around the world.

Main projects

- Production of immortal cell line resources from Iranian ethnic groups
- Establishment of cells bank for domestic animals in danger of extinction for the genetic conservation purpose in Iran
- DNA barcoding of Iranian endangered and strategic animal species: a novel molecular method for identification, management and submission of Iranian genetics resources.
- Establishment of lymphoblastoid cell lines bank for genetic diseases in Iranian population
- Establishment of primary and immortal cell lines of cancer diseases and normal tissues
- Establishment of stem cell collection
- Establishment of non-mammalian cell lines collection
- Establishment of wild life cell collection of Iran
- Establishment of reproductive cell collection of animals in danger of extinction in Iran



Microorganisms Bank

culture collections

- Bacteria and archaea (Systematic) collection
- Filamentous Fungi and Yeasts collection
- Microalgae collection
- Probiotic collection



Services

- **Services for bacteria and archaea**
 - General identification of bacteria
 - Phenotypic characterization
 - Production of biomass for the different techniques
 - Analysis of respiratory quinones
 - Analysis of DAP (2, 6-diaminopimelic acid)
 - Analysis of peptidoglycan structure
 - Analysis of whole cell sugars
 - Analysis of polar lipids
 - Partial 16S rDNA sequence analysis
 - Complete 16S rDNA sequence analysis
 - Full phylogenetic study by complete 16S rDNA sequence analysis
- **Services for filamentous fungi and yeasts**
 - Identification using partial rDNA sequencing
 - Identification of fungi using morphological characters
 - Identification of yeasts using morphological characters
 - Identification and complete phylogenetic analysis of yeasts and related fungi
- **Services for Microalgae**
 - Microscopic observations and morphological characterization
 - Molecular characterization based on a part of the rRNA operon (including the 16S rRNA and the ITS).
- **Preservation services**
 - Public deposit
 - Safe deposit
 - Distribution of Biological material of the public collection



Microorganisms bank

The Microorganisms bank is one of the most versatile culture collections in the country. Formal collections currently comprise 1464 items, including about 1048 archaea and bacteria, 241 fungal strains (yeasts and filamentous fungi) and 175 microalgae (cyanobacteria, diatoms and algae). All biological materials accepted in the different collections of Microorganisms bank are subjected to extensive quality control including molecular characterization of marker genes. **The Microorganisms bank maintains specific expertise and offers counseling in the area: Identification, microbial taxonomy, phylogeny and species description.** Standardization and quality assurance of bio-resources. Safe and public deposition.

Laboratories

- Bioinformatics unit
- Metagenomics unit
- Preservation lab.
- Mycology lab.
- Agricultural microbiology lab.
- Microalgae lab.
- Probiotic lab.
- Chemotaxonomy lab.
- Prokaryotic identification lab.



Main Projects

- Biodiversity research by culture-based and unculture-based methods including metagenomics approaches
- Start up and Know-How Agreement
- Service to identify isolates and specimens of different microorganisms using polyphasic approaches
- Training courses and workshops for students and guest researchers

