# Microbial Type Culture Collection and Gene Bank (MTCC)
# CSIR-Institute of Microbial Technology (IMTECH)
# Sector 39-A, Chandigarh-160036 INDIA


**Suresh Korpole, PhD**
**Head, MTCC**





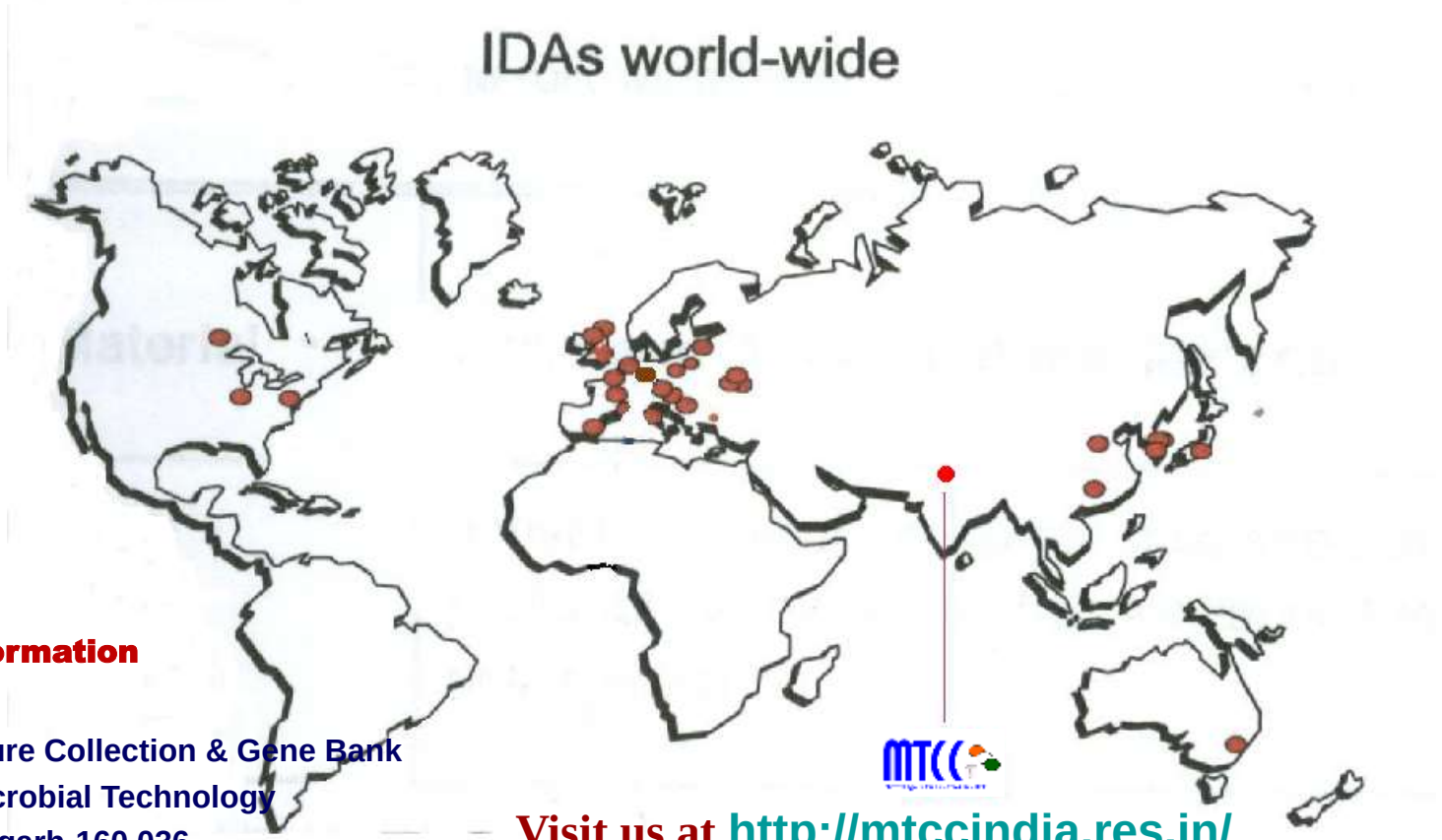
**Web Address:** ***http://mtccindia.res.in***

# MTCC objectives

- ***Ex-situ* conservation** of microbial resources of India
- To provide **authentic microbial cultures** to research organizations, academic institutes and industries
- To act as a **depository of patent cultures (WIPO-IDA)**
- To provide **microbial related services** to scientific community

# MTCC recognized as International Depository Authority on 4th October, 2002

***Member of WFCC & Registered with WDCM***




**Visit us at http://mtccindia.res.in/**

**Contact information**

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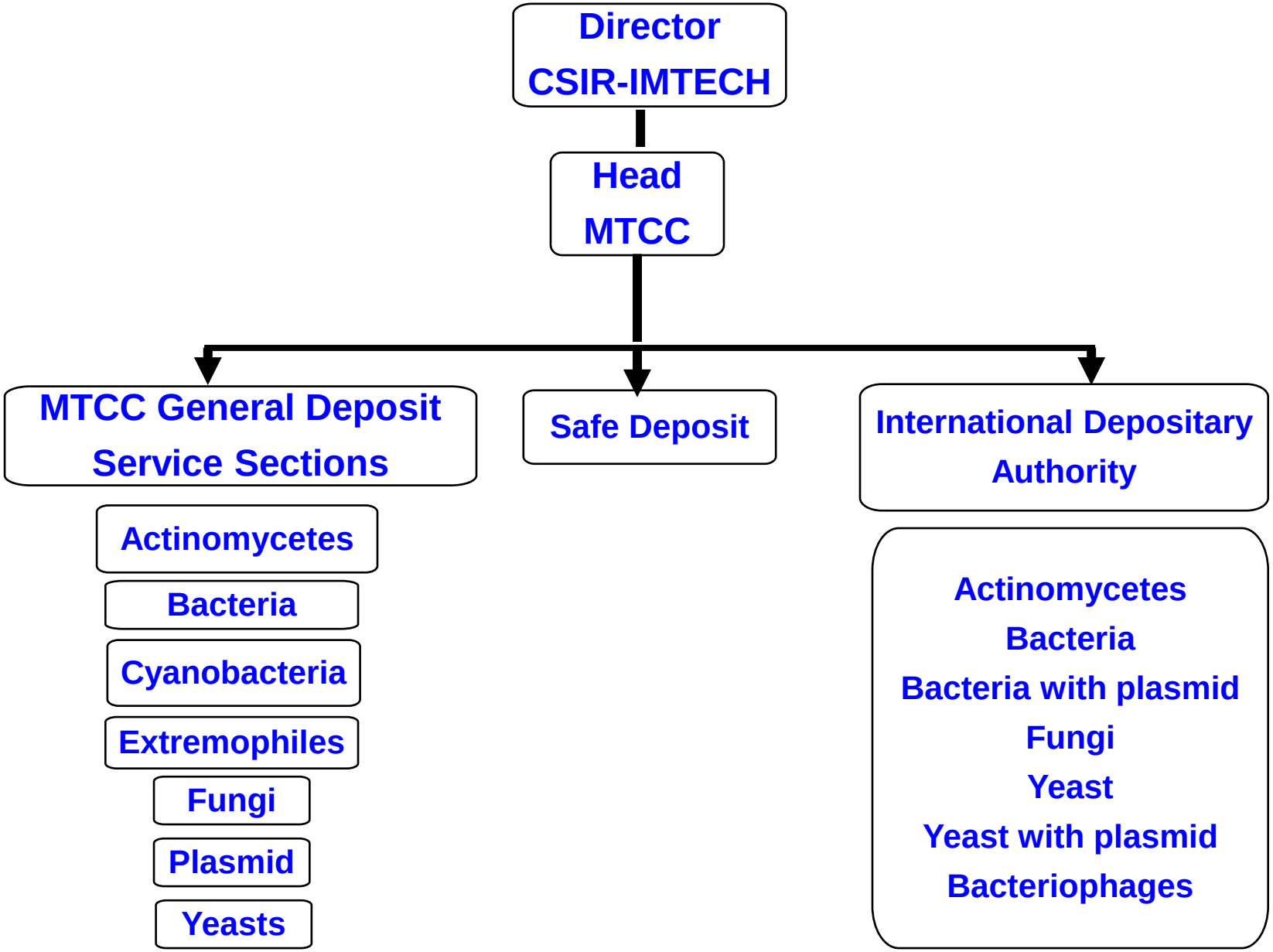
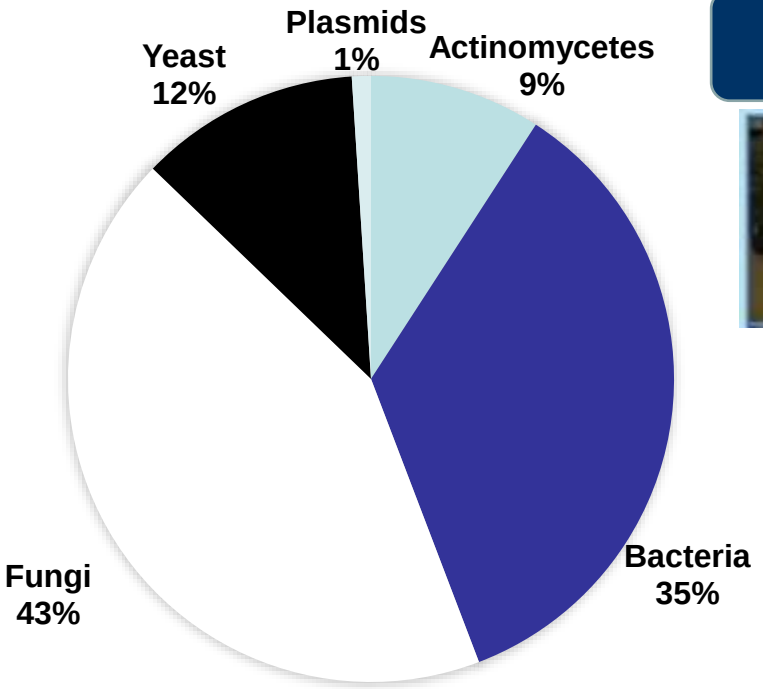
# Administrative organization of MTCC



# MTCC

## National Facility

### Repository




**Total microbial strains ~14000**

### Services

#### Supply of microbes

#### Sponsored Activities

- Antimicrobial testing
- Microbial load analysis of products and raw materials
- Microbial contaminant testing
- Water quality analysis for microbes
- Air quality analysis for microbes

# Steps Followed in Strain Deposition

Anaerobic bacteria

*Chromobacterium* sp.

**Strain receipt @ MTCC**

**Purity check**

**Microbiology service**

**Service lyophilization**

**Deposition upon confirmation**

**IDA/Patent**

**General**

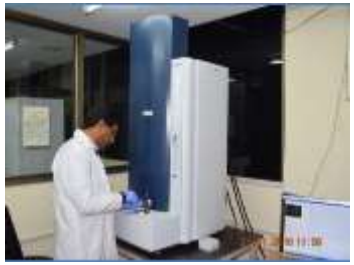
Supply

Reference strain

Restric ted supply

**Service Phenotypic**

**Service Genotypic**



# Microorganism types accepted as IDA deposits

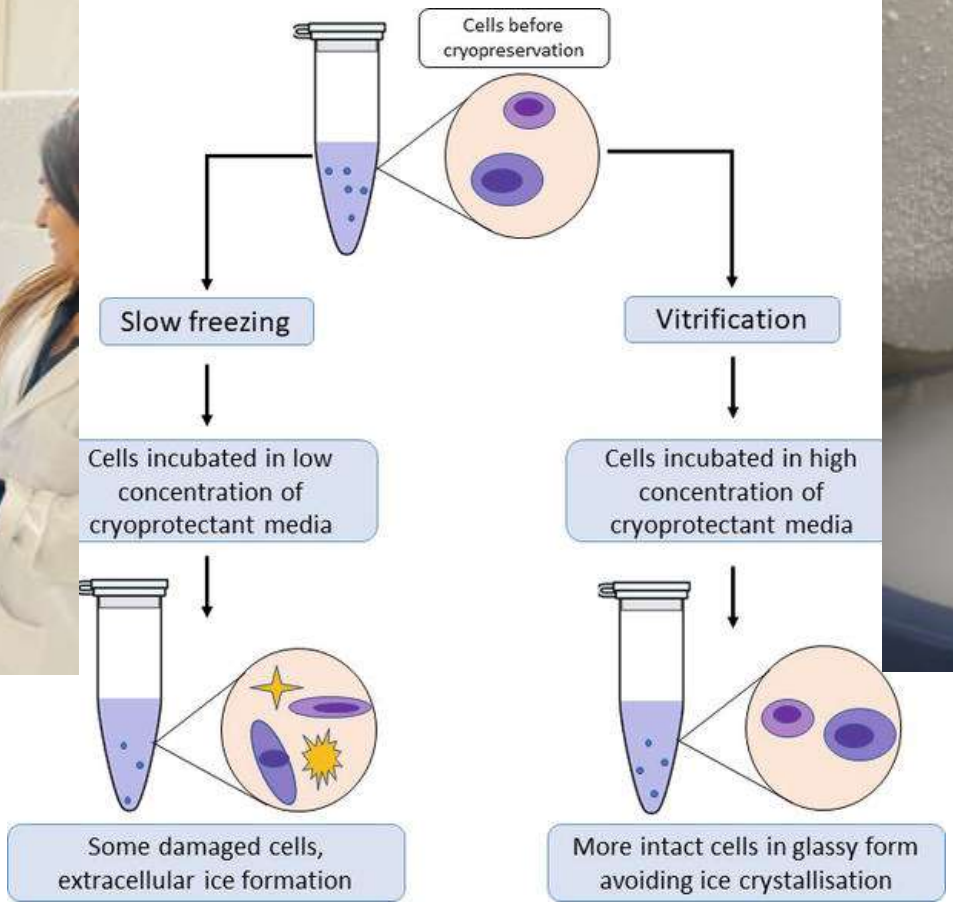
- MTCC accepts bacteria, bacteria-containing plasmids, fungi, yeasts, bacteriophages
- Plasmids in hosts and/ or as isolated DNA preparations belonging to the Hazardous Group 1 and 2 as per classification of Indian authority.
- Genetically manipulated microorganisms and isolated DNA will be accepted if they can be processed in BSL1 or BSL2 facility or confirm to Group 1 or 2 organisms.

# Steps Followed in IDA Deposition

- Purity and viability of culture tested on receipt of the culture
- MTCC assigns an accession number
- Preservation (in -70 ºC freezer, liquid nitrogen or freeze-drying or both depending on the type of organism)
- Statement of receipt (BP4) and viability (BP9) are sent to the depositor as per the guidelines
- Safe storage of microbes under scientifically controlled conditions
- Furnishing of samples according to regulations

# Cryopreservation

## Conventional slow freezing (SF)




## Rapid freezing method Vitrification (Vit)

# Processing of Freeze Drying Ampules

- Preparation of ~2000 vials per month
- Removal of failed ampules and Processing new deposits

# ISO 9001:2015 Certification of MTCC activities: High-end lyophilization unit for freeze dried ampule production and storage



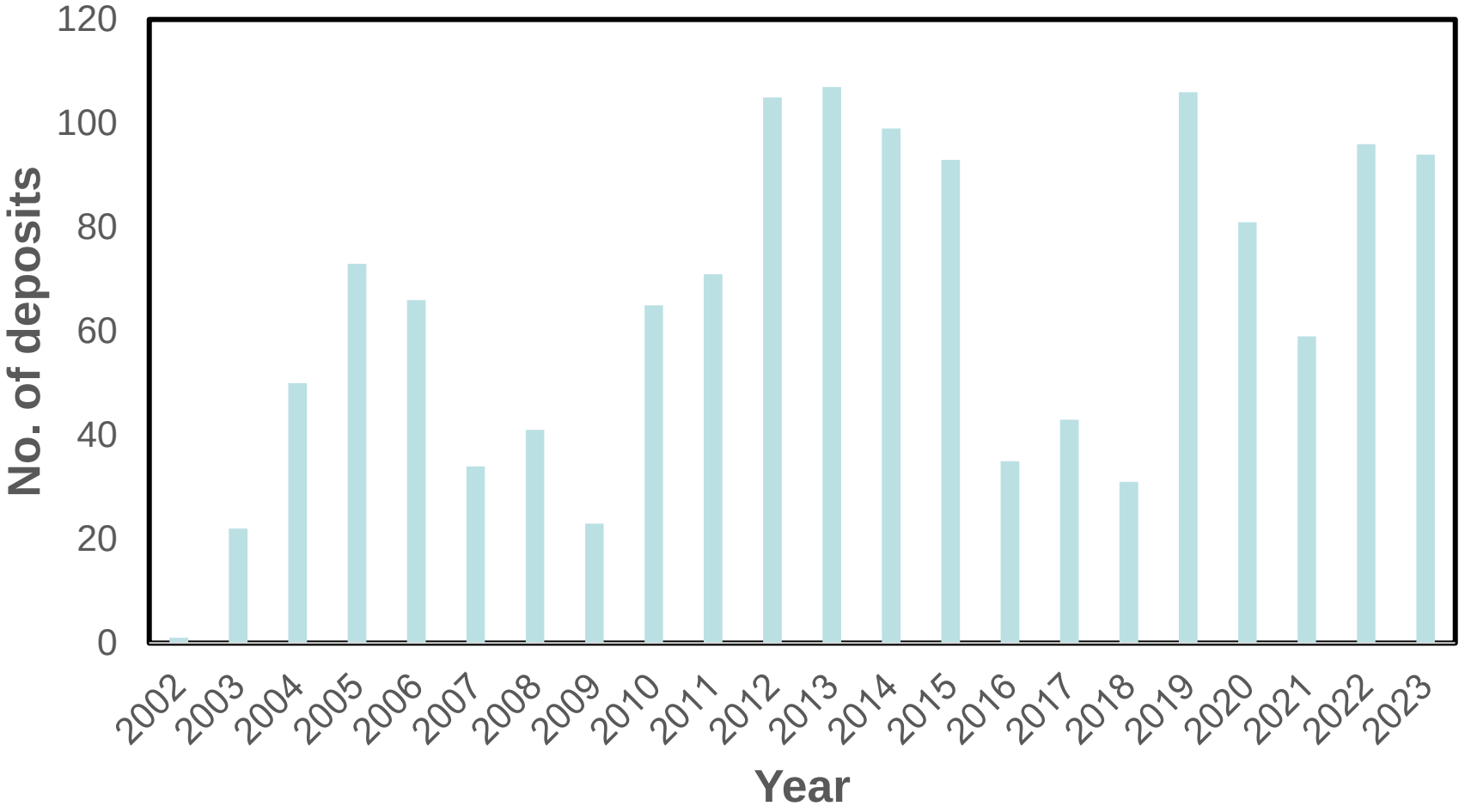
# cGMP facility at CSIR-IMTECH


## Production of cGMP cell lines

## Storage of cGMP cell lines

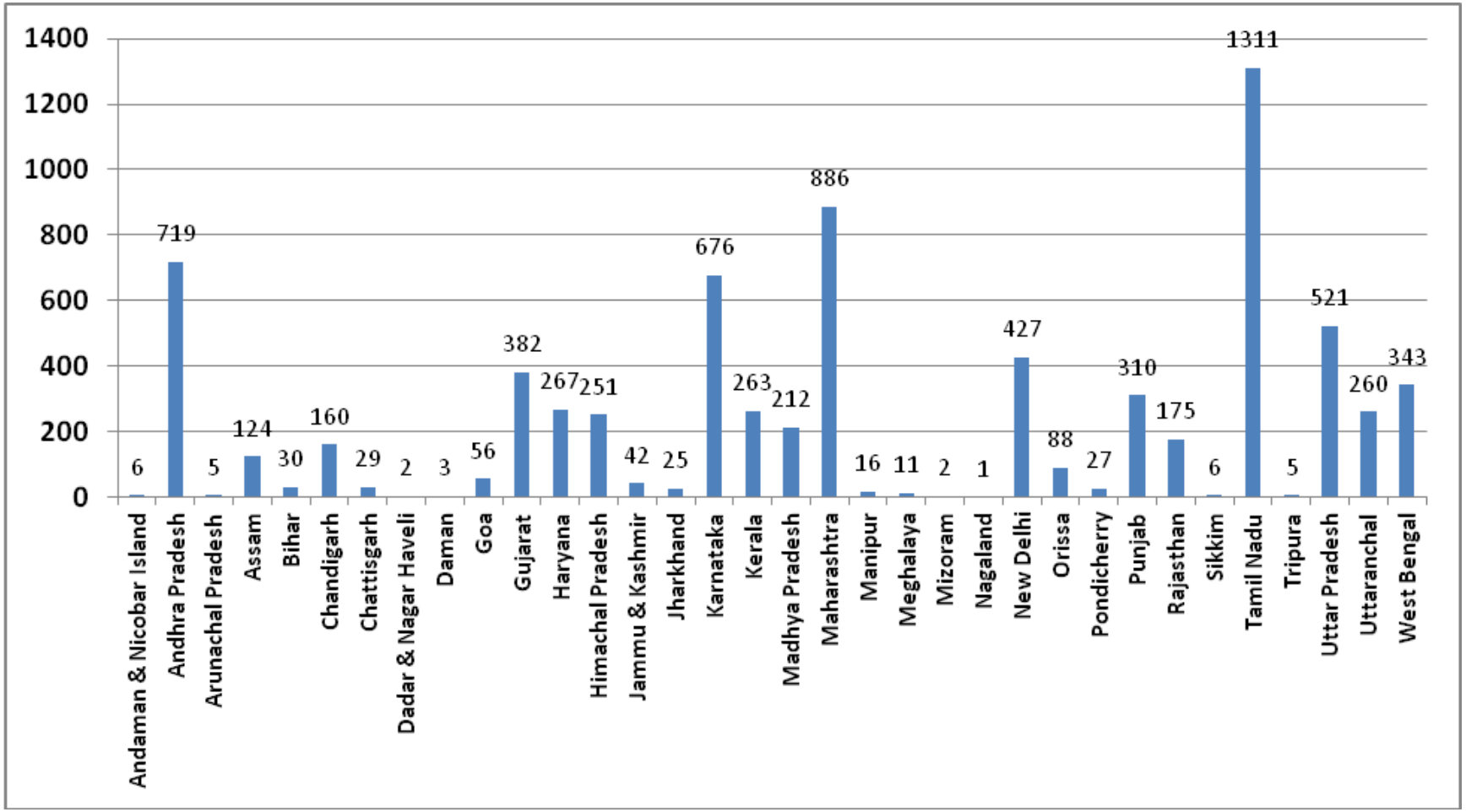
**Financial support NBM-BIRAC**

# Year-wise Number of IDA Deposits



# MTCC and stakeholders

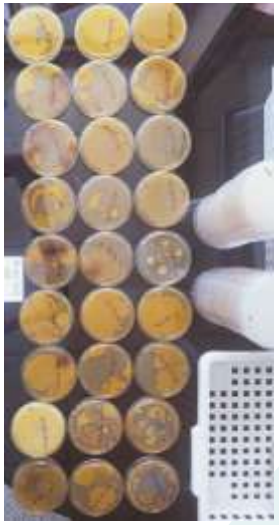
| | |
|---|---|
| Microbial Strains For General Supply | 14,000 |
| IPC Reference Strains | 15 |




**Stakeholders across the country**

# Evolution of Traditional Microbiology: IDA deposits

## Microbes to Metagenomes



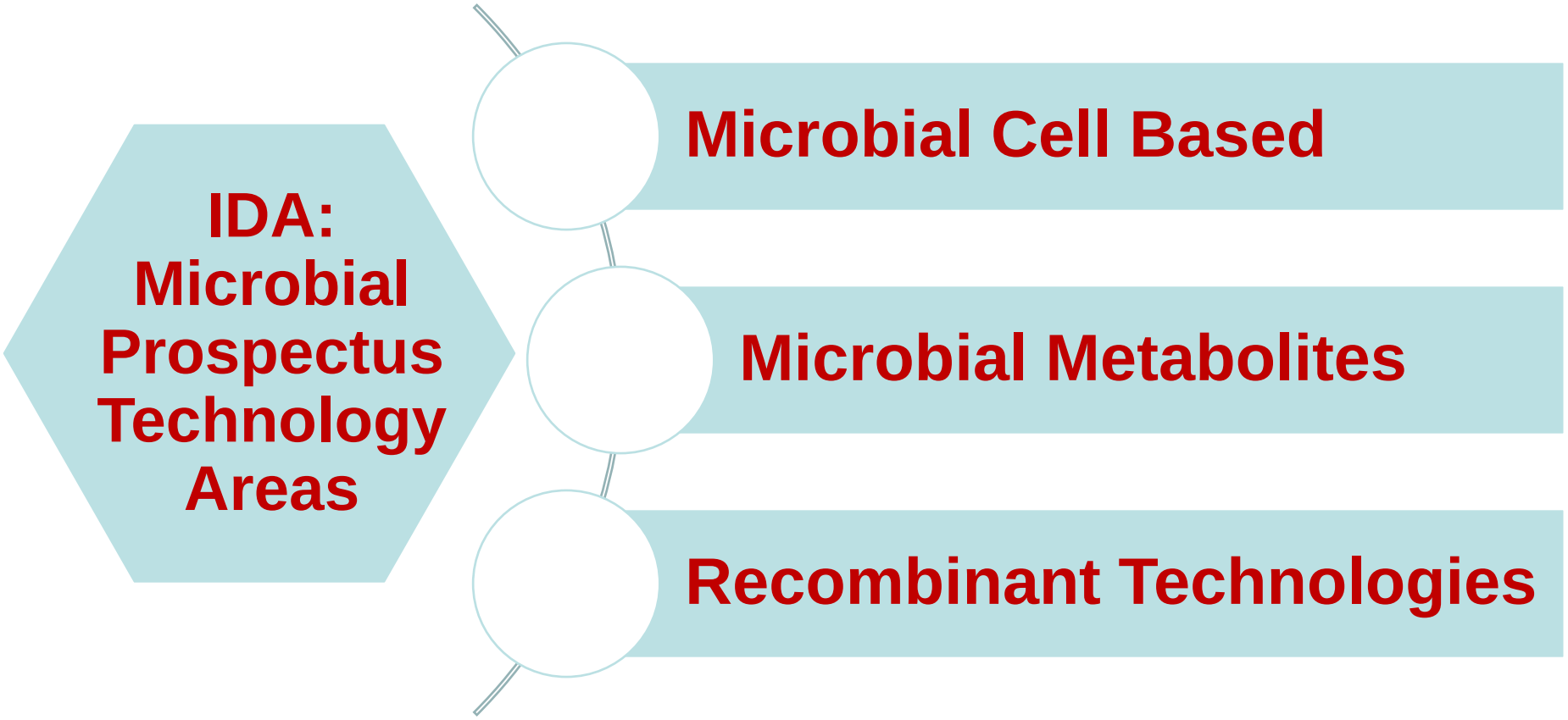
Conventional Microbiology

Molecular Microbiology

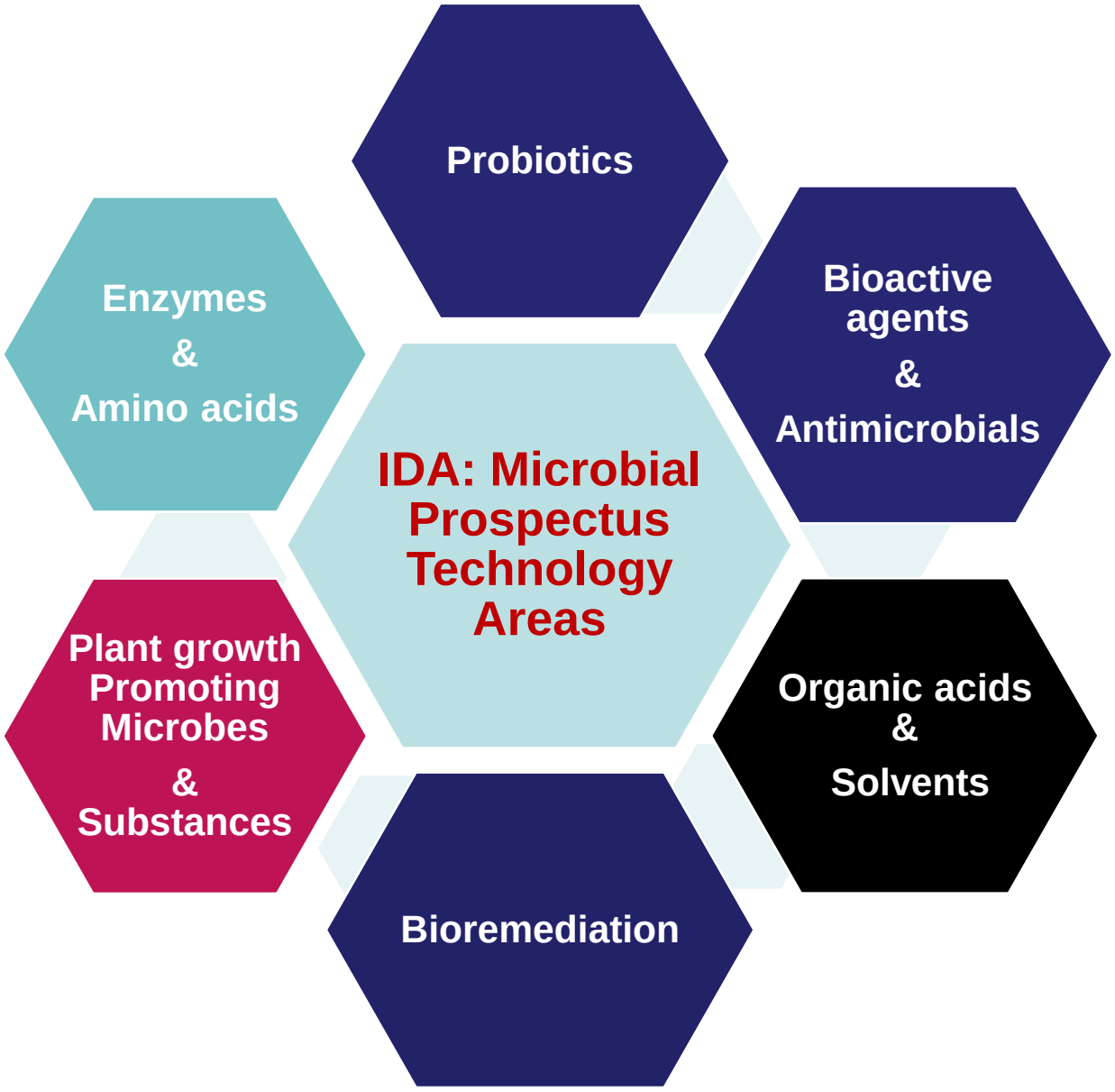
Genome Sequence Seqcode

Synthetic Biology

# IDA: Microbial Exploitation for Technologies



# IDA: Microbial Exploitation for Technologies



World J Microbiol Biotechnol (2016) 32:60
DOI 10.1007/s11274-016-2027-2

ORIGINAL PAPER

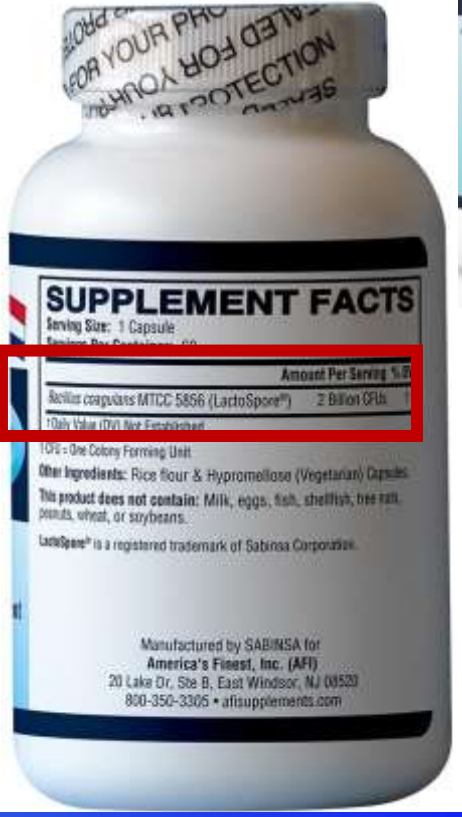
# Evaluation of genetic and phenotypic consistency of *Bacillus coagulans* MTCC 5856: a commercial probiotic strain

Muhammed Majeed[1,2] · Kalyanam Nagabhushanam[2] · Sankaran Natarajan[1] · Arumugam Sivakumar[1] · Talitha Eshuis-de Ruiter[3] · Janine Booij-Veurink[3] · Ynte P. de Vries[3] · Furqan Ali[1]


Journal of Functional Foods
Volume 52, January 2019, Pages 100-108

# Probiotic *Bacillus coagulans* MTCC 5856 spores exhibit excellent *in-vitro* functional efficacy in simulated gastric survival, mucosal adhesion and immunomodulation

Tanvi Shinde [a b], Ravichandra Vemuri [b], Madhur D. Shastri [b], Agampodi Promoda Perera [b], Stephen Tristram [b], Roger Stanley [a], Rajaraman Eri [b]




**MTCC 5856**

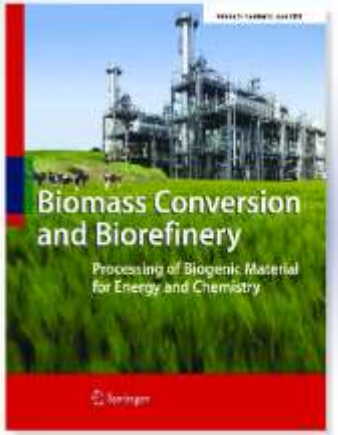
*Process optimization for butanol production from developed rice straw hydrolysate using* Clostridium acetobutylicum *MTCC 481 strain*

**Amrita Ranjan, Rahul Mayank & Vijayanand S. Moholkar**

**Biomass Conversion and Biorefinery**
Processing of Biogenic Material for Energy and Chemistry

ISSN 2190-6815
Volume 3
Number 2

Biomass Conv. Bioref. (2013) 3:143–155
DOI 10.1007/s13399-012-0062-2




Springer


**MTCC 25072**


**MTCC 5727**

# *Trichoderma harzianum* MTCC 5179: Biocontrol agent

## Trichoderma Harzianum MTCC 5179, A Biocontrol Agent Against Phytophthora Foot Rot-Talc Formulation


**Product Background**

ICAR-Indian Institute of Spices Research, Kozhikode has successfully developed, field-tested *Trichoderma harzianum* MTCC 5179 in the talc form. This biopesticide can effectively manage *Phytophora* foot rot and slow decline disease in black pepper

**Description**

The production of black pepper is hampered by *Phytophora* foot root caused by *Phytophora* spp.in all black pepper growing countries. Talc formulation of *T. harzianum* MTCC 5179 can be used to successfully manage *Phytophora*. This technology can be effectively used integrated pest management and in organic farming system.

# Technologies: Isolation and Preservation Biological Material

**Advances in single-cell biology**

Led to methods for preserving individual cells or small cell populations

Microfluidic devices and specialized storage solutions cater to single-cell sample requirements.

**Smart Freezers and Refrigerators**

They are equipped with temperature and humidity monitoring, as well as alarms for deviations.

Provide real-time data and remote access to ensure sample integrity and safety


**Automated Sample Storage Systems**

Robotic freezers and liquid nitrogen tanks, optimize sample storage and retrieval and minimize manual handling and reduce the risk of contamination or sample degradation

# Latest Technologies: Receiving and Storing Biological Material

**Automated Sample Receipt Systems**

Use robotics to handle, record incoming samples, reducing human error and improving efficiency


**Barcode labels or Radio-Frequency Identification**

Allows quick and accurate identification of samples, while RFID provides real-time monitoring and location tracking

**Biobanking Solutions**

Modern biobanks employ sophisticated tracking systems, high-capacity storage solutions, and state-of-the-art security measures

# MTCC Scientific Out reach

NATIONAL SKILL DEVELOPMENT MISSION
राष्ट्रीय कौशल विकास मिशन
N·S·D·C
National Skill Development


# MTCC-Affiliations






# Points to be Discussed

1) Procedure for the addition of new biological resources to IDA deposits

2) Procedure to modify/change/add or completely replace the name of the depositor in a situation where original depositor is not traceable (any specific requirement!)

3) How to revise the fee structure! Details of permission required from WIPO (**Storage under Rule 12.1(a)(I) and Conversion of a deposit**)

4) Does WIPO approval required for any change in the lab information management system (data loggers) or infrastructure

5) Training for the staff in member culture collections with or without financial support by WIPO to upgrade their technical skill

6) Forum created for the member culture collection of Budapest treaty


Thank You