

# **WDCM-Training Course of microbial resources information and management and utilization for developing countries**

## **Personal introduction**

Doctorate in Microbiology from GB Pant Institute of Himalayan Environment and Development, Almora, India in October 2013. Research experience of around 9 years in the field of environmental microbiology and published around 20 articles in peer reviewed scientific journals. Currently, working in Microbial Culture Collection, National Centre for Cell Science, Pune, India as a Scientist. In-charge of International Depository Authority for the deposition of microorganisms for patent purposes under Budapest Treaty. Research interest is to analyze microbial communities associated with extreme environments like glaciers, hot springs, deep sea and coal mines etc.

*Name of your culture collection:*

***Microbial Culture Collection, National Centre for Cell Science, Pune, India. First floor, Central Tower, Sai Trinity Building Garware Circle, Sutarwadi, Pashan Pune, Maharashtra 411021, India, Ph.:+91-20-25329000/9028, Fax:+91-20-25692259, mcc@nccs.res.in.***

## ABSTRACT

Microbes constitute the largest biomass on the earth and comprise of three domains of life (Bacteria, Archaea and Eukaryotes). Discovery of new microbial taxa or strains need to preserve to make them accessible to other researchers for research, teaching and for biotechnological exploitation. Individual laboratories are unable to do this due to lack of financial support and manpower. This role is thus played by a culture collection. Microbial resource centers play vital role in the conservation and sustainable use of microbial resources and also provide the authentic biological material for high quality research and teaching in the form of reference strains, reagents for quality control etc.

710 culture collections over the globe are member of WFCC and the database related to the collections is available on WDCM website for free access which is very helpful in getting recognition and visibility to the biological resources associated with the collections. Training course organized by WDCM, Institute of Microbiology, Chinese Academy of Science is a good initiative to bring the culture collections on single platform from the developing countries and help them sharing database with WFCC/WDCM.

**Key words: Microbial Resources, WFCC, WDCM, Database**

## **1. Brief introduction of your Culture Collection.**

Microbial Culture Collection (MCC) at National Center for Cell Science is one among the 708 collections from 72 countries registered with World Data Centre for Microorganisms (WDCM) database till 2014. It is supported by Department of Biotechnology (DBT), Ministry of Science & Technology, Government of India. MCC is country's newest culture collection with largest holdings in the world. Its genesis lies in a major initiative taken by DBT, Government of India towards microbial bioprospecting. Nine government institutions across the country and one pharmaceutical company were involved to achieve this goal. All the Institutes were given diverse niches for the exploration of microbial diversity. This ambitious program envisaged collection of over 2 lakh isolates from these different ecological niches. These were screened for a variety of bioactive molecules using high through put screening facility available with Piramal Life Sciences. It was also envisaged that this precious collection should be available to other interested users for future use at a single location, and thus Microbial Culture Collection (MCC) was created at National Center for Cell Science (NCCS), Pune. MCC has been recognized as International Depository Authority (IDA) by the World Intellectual Property Organization, Geneva, Switzerland under Budapest Treaty on 9th April 2011. It is also recognized as Designated

National Repository for Microorganisms on 8th July 2013 by Ministry of Environment, Forest and Climate Change (MoEF & CC), New Delhi, India under Biological Diversity Act 2002.

Apart from providing various research related services, the faculty of the culture collection is also involved in the highest quality research. Faculty is actively involved in research which is focused on microbial diversity, metagenomics, ecology and taxonomy using classical as well as modern molecular approaches. Expertise and publication records of MCC reflect the research potential of the research faculty as well as the reason for being the best microbial resource facilities in India. At present a total of 46 staff members including research faculty (12), consultant (2), technicians (25) and administrative staff (7) are making their efforts to maintain the standards of the research and services at MCC. DBT has also taken an initiative to make MCC an independent entity to serve the nation for the characterization, authentication and long term preservation of precious microbial resources.

### **Holdings at MCC**

As per WDCM data, MCC has largest collection of bacteria under a single roof. At present it holds more than 2, 00,000 microorganisms, majority of which are isolated under DBT's Microbial prospecting project while others are deposited by investigators across the country. In addition

a large number (30,000) was also donated by a company, Piramal Enterprises Limited. These cultures are available for research purpose to the investigators who wish to undertake large scale screening programs, with Material Transfer Agreement (MTA). MCC has around 1174 bacterial cultures and 250 fungal cultures deposited under general deposit which are accessible to researchers. A total of 110 strains have been deposited as patent deposits under International Depository Authority (IDA) while 23 strains are deposited under safe deposit. MCC provides a high level of confidentiality and secrecy to the cultures deposited under IDA and safe deposit. All the cultures are preserved in three different forms -80°C, liquid nitrogen and in lyophilized form. The cultures are supplied to the users either as lyophilized ampoule or as growing culture on the slant.

## **Services at MCC**

MCC provides various services on payment basis which are as follow:

### **1. Supply of Cultures**

MCC supplies its public access general deposit cultures to researchers in India for academic and research purposes. MCC also has a provision of distributing cultures from the “microbial prospecting project” under material transfer agreement. At present a total of approximately 5000

cultures have been supplied to different research institutes and universities for academic and/or research purpose. The cultures are also made available to researchers in other countries following the prevailing procedures laid by National Biodiversity Authority of the country.

## **2. Culture Deposit Service**

MCC accepts bacteria (aerobic, anaerobic, cyanobacteria, photoautotrophic bacteria) fungi, DNA samples and plasmids for deposit under general, safe and patent deposits. At present MCC accepts microorganism which fall under BSL-2 category. MCC is receiving cultures for this service from several institutions across India and overseas. The cultures are checked for the authenticity by 16S/18S rRNA gene sequencing and later preserved by two different methods 1) 20% glycerol stocks at -80 °C and in Liquid nitrogen (-196 °C) and 2) freeze drying method. There is a nominal fee for the safe and patent deposits under IDA while general deposit is free of cost.

## **3. Identification services**

Since October 2012, MCC began offering paid identification services like rRNA gene sequencing, phylogenetic analysis, MALDI-TOF typing, FAME (fatty acid methyl ester) analysis, G+C mol% (Tm & HPLC), and DNA-DNA Hybridization etc.

**4. Other Services:** MCC also provides Services like Isolation and purification of genomic DNA and Freeze-drying of microbial cultures as well.

**5. Training courses and workshops:** MCC actively participates to conduct training and workshops in colleges to promote science among the young researchers. MCC also accepts master students across India to carry out their research project as part of their degree in the field of microbial diversity and taxonomy. MCC also accept application from foreign students under exchange/bilateral programs to carry out training or research studies.

### **ISO Certification**

MCC has implemented ISO 9001 in October 2013 for its general and IDA deposit services. After expert opinion from DSMZ, technical specifications to invite ISO consultants were prepared, tenders were invited and one company was given the order for consulting for ISO certification. A set of standard operating procedures (SOP) for various activities performed during processing of cultures for deposit have been devised, they were deliberated upon by the entire MCC staff and revised versions were approved by the ISO consultant. As per the ISO 9001 requirement, the first audit review for certification is due soon.

MCC website <http://www.nccs.res.in/mcc/index.html>

**MCC**  
**Microbial Culture Collection**  
National Centre for Cell Science, Dept. of Biotechnology, Govt. of India  
Member WFCC, an IDA under the Budapest Treaty, DNR of MoEF

NCCS Mail | Home | Services | Catalogue | Downloads | Fee structure | Staff | Contact us  
Careers@NCCS  
NCCS Website  
MCC-BRC DBMS

**News and Events**  
for more details on the Society.

**NEW** MCC has shifted its facility in new campus at Sai Trinity from March 2014 [detailed address](#)

**NEW** MCC is now recognized as a [Designated National Repository](#) for

[Click here](#) to read our article published in Indian Journal of Microbiology

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First floor, Central Tower, Sai Trinity Building Garware Circle, Sutarwadi, Pashan Pune, Maharashtra 411021, India  
Tel. No: +91-20-25329000, Fax: +91-20-25692259 Email: [mcc@nccs.res.in](mailto:mcc@nccs.res.in)

## 2. Benefit from the training courses.

I feel that the training course was very useful in numerous ways. In the course at Chinese Academy of Science (CAS) there were various lectures on very important topics like database management and how WDCM is working on the information regarding the strains preserved at various culture collections. Before training, we attended the conference (WDCM 50<sup>th</sup> anniversary) and it was very much informative related to issues related to the culture collection. The conference was also helpful in interacting with well known scientists across the globe. During the training, lectures on microbial genomics and genome annotation were of great help to work on the genome sequencing of the microbial resources associated with our collection. This has helped me in getting an insight



into the pipelines used to analyses the bioinformatics analysis. Lectures on the general application policies for international students would be helpful in sharing this information among the research students to carry out research studies at China.

The training has also helped me in having discussion among the representatives of the culture collections came for the training course. This interaction will pave my way for future collaboration by writing exchange programs or joint research proposal with these collections. Several lab visits helped me to understand the laboratory practices and protocol used at the Chinese Academy of Science which will also help me to share these laboratory practices among my colleagues and students back in India.

Lecture on characterization of bacterial strains for bacterial taxonomy was very informative and it will help me for my future research on bacterial taxonomy of extremophiles. Training also helped me in learning procedures related to ISO standards as MCC is looking forward to acquire ISO standards very soon. Apart from the scientific discussion, the stay in Beijing has also helped me to know about the history of Beijing as well as the history of many temples (Lama temple & Heaven Temple) and other very important places like The Great Wall of China, Summer Palace and Forbidden City.

### **Suggestion on WDCM work.**

WDCM is making a significant contribution to make the collections visible not only from the developed countries but also from the developing countries. The WDCM also serves as the data center of the WFCC and acts as an important resource for all activities or services related to the culture collections. Some of my personal suggestion in order to improve visibility among the culture collection is by helping or making it mandatory to have a webpage in English so that it is easy for the researchers to get the accessibility to the biological material of the collections.

### **6. Comments or suggestion on the training courses.**

I am very much happy with the overall training course and type of lectures which were organized by the WDCM during the event. Personally, I feel that the course can be divided into 50% lectures and 50% hands on training which will be more useful for the future participants for such trainings. Since, genome sequencing is going to be compulsory for publishing data related to novel strains; I will suggest a session in the course dedicated to hands on training for genome analysis to the members of collection where no such expertise are available. Apart from this it

would be more appropriate if the duration of the training is little shorter, may be upto 10 days maximum. Funding for the local expenses and the accommodation made by WDCM were quite good.

## **7. Suggestion on further cooperation between WDCM and your collections.**

MCC is looking forward to participate actively in sharing the data related to the collection generated from the project microbial mission. The microorganisms were isolated with the help of 9 research institutes in the country and the comprises of 2,000,00 We would be happy to conduct similar training course in collaboration with WDCM in future.

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