

# THE ROLE OF WFCC IN THE UTILIZATION OF MICROBIAL RESOURCES FOR THE BENEFIT OF THE MANKIND

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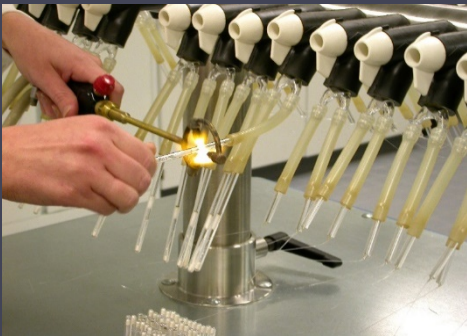
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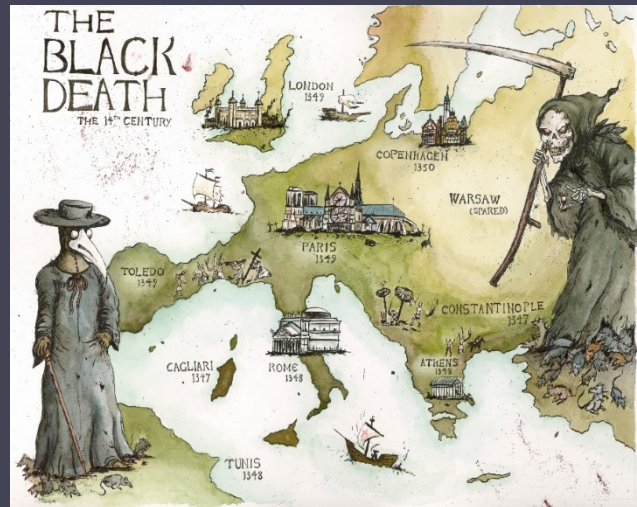


ON BEHALF OF THE EB OF THE WFCC, I THANK THE ORGANIZERS OF THE ECCO'2019  
FOR THEIR KIND INVITATION

# CULTURE COLLECTIONS IN MEDICAL CONTEXT



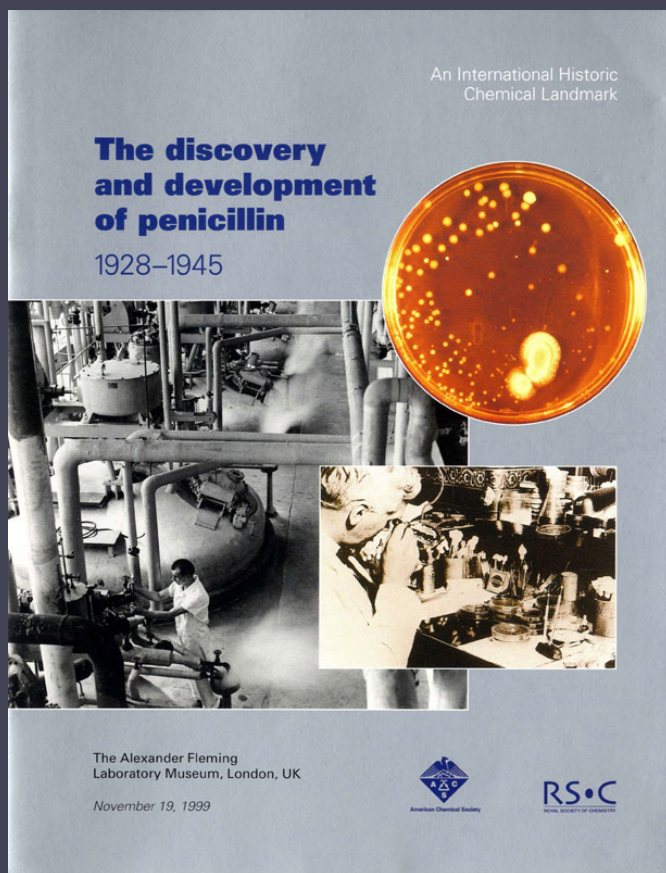
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# CULTURE COLLECTIONS IN INDUSTRIAL CONTEXT



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# CULTURE COLLECTIONS IN BIOTECHNOLOGICAL CONTEXT



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# CULTURE COLLECTIONS IN STARTER CULTURE/FOOD INDUSTRY CONTEXT



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# CULTURE COLLECTIONS RESPONDING THE NEEDS BROUGHT UPON BY RECENT ADVANCES

**GENOMICS  
METAGENOMICS  
FUNCTIONAL DIVERSITY  
FUNCTIONAL GENES**



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## *Surveillance targets*

## *Metagenomic insight*

### **(A) Environment**

- Food industry
- Wild/Bush meat
- Aqua culture/Fishery
- Sewage

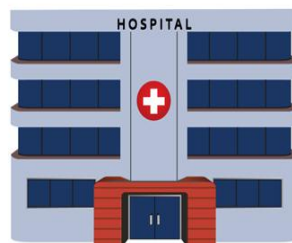
- Viral trends
- Potential outbreak strains
- Novel emerging viruses



### **(B) Food**

- Consumer foods
- Imported foods
- Illegal trade

- Viral origins
- Viral trade routes
- Food safety



### **(C) Outbreak**

- Patients in clinic
- Local area

- Foodborne origin recognition
- Cluster detection
- Outbreak tracing



# **DETECTION AND PRESERVATION OF MICROBIAL BIOINDICATORS**

**POLLUTION  
CLIMATE CHANGE  
GLOBAL WARMING**



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## AFTERMATH OF CHERNOBYL

After the 1986 Chernobyl nuclear disaster, 70,000 reindeer in Lapland that had been raised for food had to be destroyed because of high levels of radiation

The lichens on which the reindeer fed had absorbed radioactive cesium-137, which was spread in the air

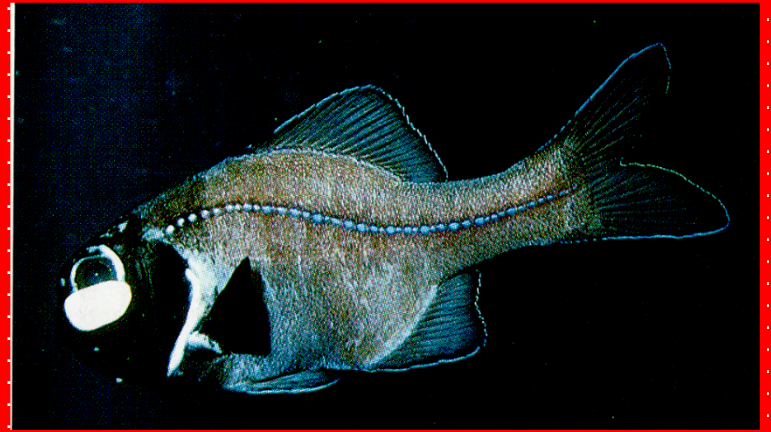


## BIOLUMINESCE

Some marine invertebrates and fish establish mutualistic relationships with luminescent bacteria

These fish sometimes use the glow of their resident bacteria as an aid to attracting and capturing prey in the complete darkness of the ocean depths

If these bacteria are detrimentally impacted due to pollutants, the ecological consequence of such impact is significant



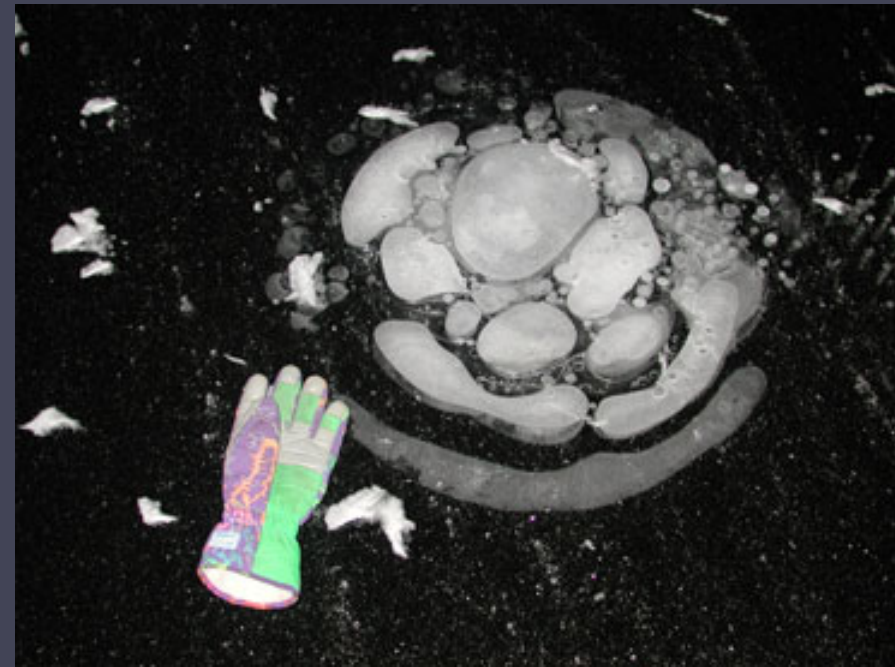
**Deep sea flashing fish**







# GREEN HOUSE GASES



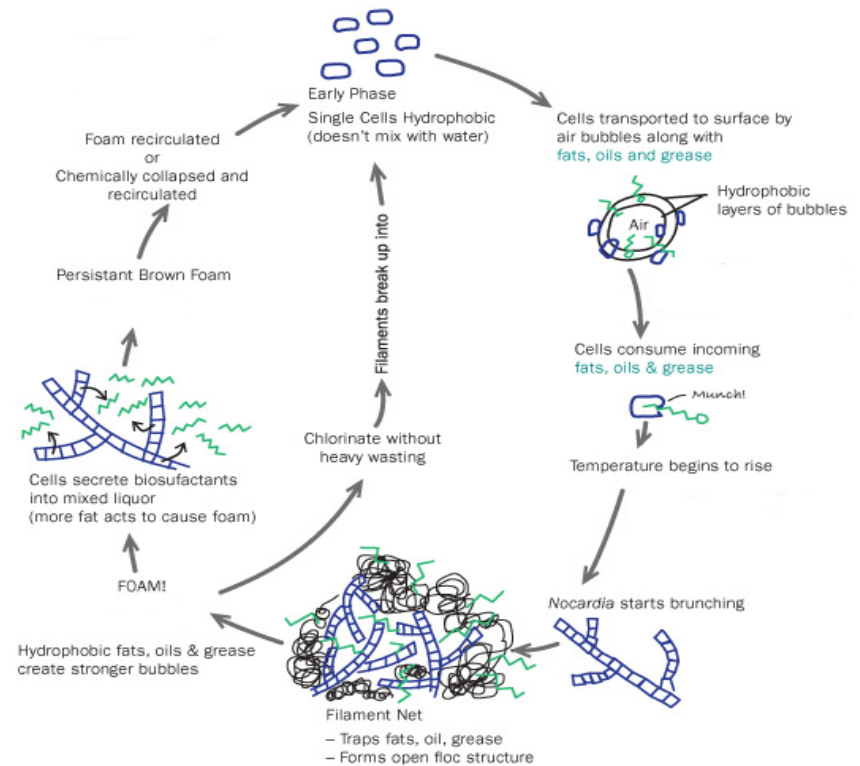
Melting Permafrost and  
emergence of Methane  
gas producing bacteria



# Foaming in the Waste Water Treatment Plants



## Mechanism to cause foam: *Nocardia* — The vicious foam cycle



©<http://www.teamaquafix.com/nocardia.aspx>



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YOUR PANPA NEWSPAPER OF 2012 Australasia's top publication for the second consecutive year



SHARK STUPIDITY Marine expert says tourist's actions posed danger – see Page 2



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**Functional Diversity** The biological and chemical processes such as energy flow and matter recycling needed for the survival of species, communities, and ecosystems.

**Ecological Diversity** The variety of terrestrial and aquatic ecosystems found in an area or on the earth.



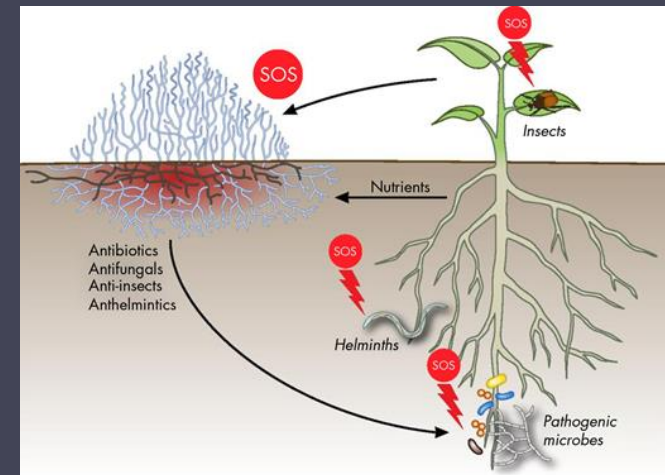
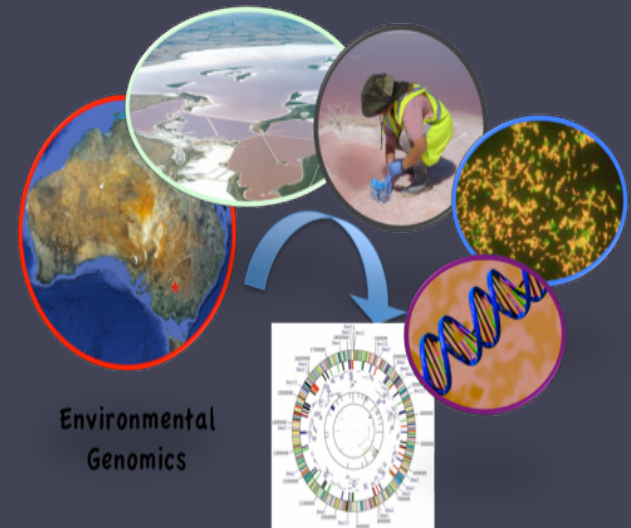
**Genetic Diversity** The variety of genetic material within a species or a population.

**Species Diversity** The number and abundance of species present in different communities.

# THE CONVENTION ON BIOLOGICAL DIVERSITY

The CBD obliges governments to take a number of measures in order to fulfil its objectives of conserving biodiversity and using it sustainably. These measures include:

- Monitoring and identification of biodiversity
- Environmental impact assessments
- National strategies, plans or programmes to conserve and use of the components of biological diversity sustainably
- The integration of biodiversity policy into relevant sectoral or cross-sectoral plans, programmes and policies
- The Convention also focuses on threats to biodiversity and ecosystem services, including those from climate change and technological advancements utilizing biological resources
- Promotes a sustainable development and the “Future We Want”



## The three key objectives of the CBD

- (i) the conservation of biological diversity,
- (ii) the sustainable use of its components and
- (iii) the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate
  - (i) access to genetic resources
  - (ii) transfer of relevant technologies, taking into account all rights over those resources
- (iii) funding

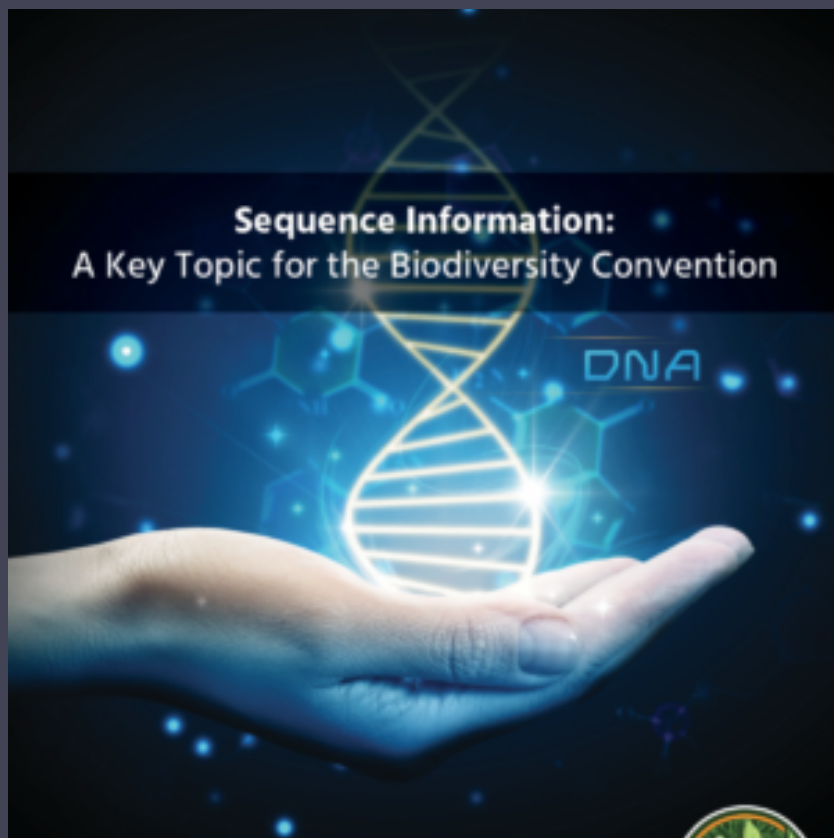
The Convention is the first agreement to address all aspects of biological diversity: species, ecosystems and genetic resources. It is indeed the first time that genetic diversity is specifically covered in a binding global treaty

The Convention also recognises - for the first time - that the conservation of biological diversity is "**a common concern of humankind**" and **an integral part of the development process**

In other words, the Convention recognises that **all humanity has an interest ensuring the conservation of biological diversity**, including poor nations, women and indigenous people, and that it needs to be addressed by concerted international action





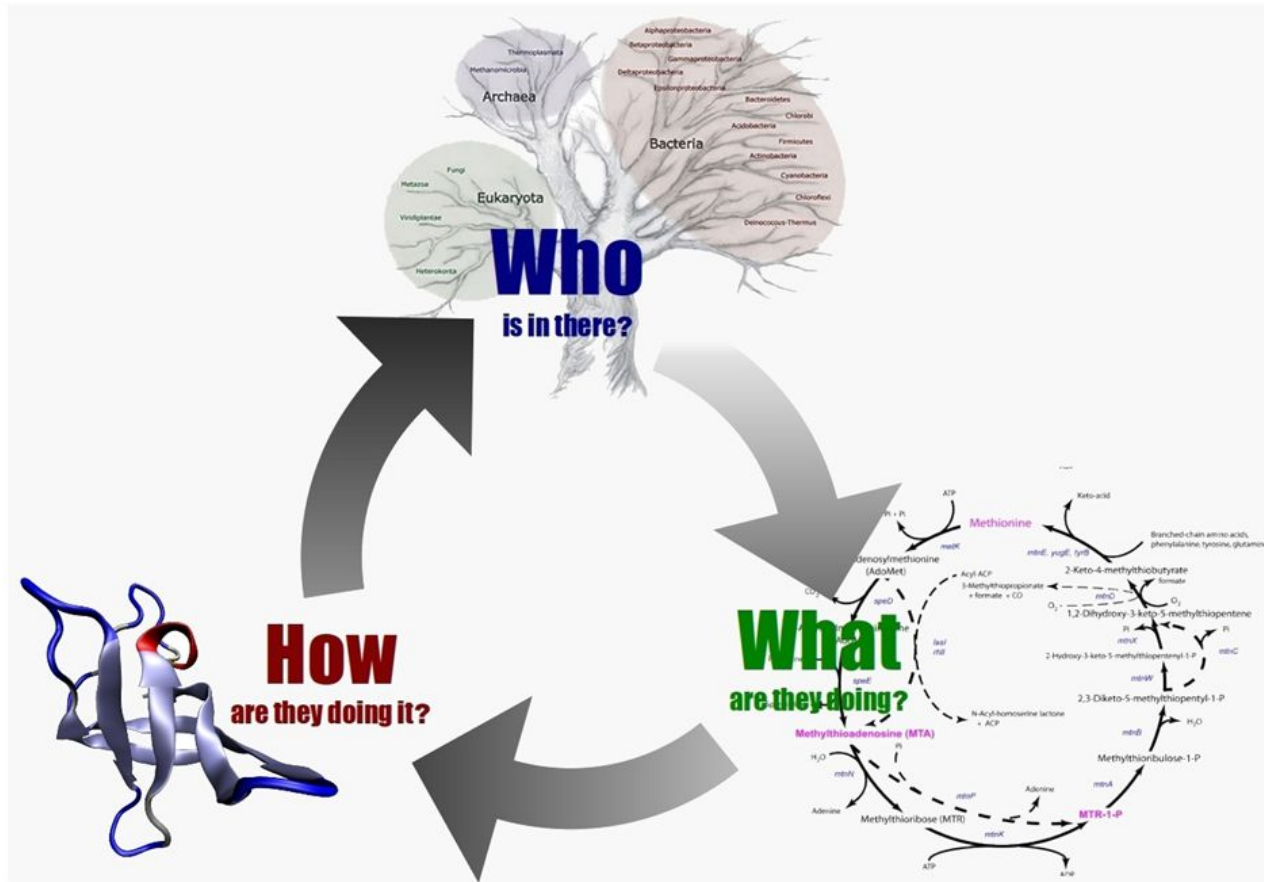


**CBD: All humanity  
has an interest  
ensuring the  
conservation of  
biological diversity**



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# Metagenomics



# DSI

The World Health Organization may be an appropriate source of knowledge on proportionate frameworks to ensure benefit-sharing from research, based on digital sequence information, does not hinder epidemic preparedness, response efforts or international collaborations



Two European organizations and a US company produced an Ebola vaccine using the genetic sequences of the virus that was deposited in GenBank





## CULTURE COLLECTIONS

Are the bodies that the **public and the policy makers** can call upon for objective help in developing **regulations and guidelines** for the **safe and ethical use of biological resources** while ensuring compliance with the three key objectives of the CBD



**WFCC** IS THE LARGEST INDEPENDENT GLOBAL ORGANISATION THAT REPRESENTS CULTURE COLLECTIONS CONCERNED WITH THE COLLECTION, AUTHENTICATION, MAINTENANCE AND DISTRIBUTION OF CULTURES OF MICROORGANISMS AND CULTURED CELLS

# WFCC'S POSITION ON THE OPEN ACCESS TO DSI

- WFCC supports open access to DSI for the advancement of biological sciences and scientific endeavours,
- Culture collections require such information to be able to correctly identify the cultures under their conservation. Integrity and true identity of such reference strains have extreme importance for taxonomists when new strains are identified using such reference strains,
- In parallel, the WFCC also acknowledges that the benefit sharing rights that should be acknowledged during the utilization of the DSI,
- WFCC strongly supports the ethical use of DSI at all times,
- WFCC also acknowledges sovereign rights and existing rules and regulations that might apply to information sharing in locations where the original DSI might have been generated



**WFCC** WILL CONTINUE TO PLAY AN  
INTEGRAL ROLE IN LINKING  
SPECIALIZED CULTURE COLLECTIONS  
TO PROVIDE A SOUND PLATFORM  
OF KNOWLEDGE FROM WHICH BIO-  
ECONOMIES AND  
ENVIRONMENTALLY-FRIENDLY AND  
SUSTAINABLE GLOBAL  
DEVELOPMENT WILL EMERGE

## **WFCC PARTNERSHIPS**

**IUMS, ECCO, GBIF, WHO,  
CBD, WIPO, ISO, WHO,  
FAO**

**WFCC WILL ALSO ENSURE SUSTAINED EXISTENCE OF  
ENDANGERED CULTURE COLLECTIONS**

**(PLEASE REFER TO THE WFCC WEB SITE TO DOWNLOAD THE  
QUESTIONNAIRE)**



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# WFCC-WDCM PARTNERSHIP: GLOBAL CATALOGUE OF MICROORGANISMS

ACCEPTED MANUSCRIPT

## The Global Catalogue of Microorganisms 10K type strain sequencing project: closing the genomic gaps for the validly published prokaryotic and fungi species

Linhuan Wu, Kevin McCluskey, Philippe Desmeth, Shuangjiang Liu, Sugawara Hideaki, Ye Yin, Ohkuma Moriya, Takashi Itoh, Cha Young Kim, Jung-Sook Lee ... [Show more](#)

*GigaScience*, giy026, <https://doi.org/10.1093/gigascience/giy026>


**Published:** 22 March 2018

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### Abstract

Genomic information is essential for taxonomic, phylogenetic and functional studies to comprehensively decipher the characteristics of microorganisms, to explore microbiomes through metagenomics, and to answer fundamental questions of nature and human life. However, large gaps remain in the available genomic sequencing information published for bacterial and archaeal species, and the gaps are even larger for fungal type strains. The Global Catalogue of Microorganisms (GCM) leads an internationally coordinated effort to sequence type strains and close gaps in the genomic maps of microbes. Hence, the GCM aims to promote research by deep-mining genomic data.



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Preliminary Programme available online at: [www.iccc15.ufro.cl](http://www.iccc15.ufro.cl)

www.iccc15.ufro.cl/index.php

 UNIVERSIDAD DE LA FRONTERA

6 años ACREDITADA EN TODAS LAS ÁREAS HASTA NOVIEMBRE DE 2024 

**15th International Conference on Culture Collections - ICCC15**

**"Exploiting microbial resources to generate social wellbeing"**  
Pucón, Chile, 25th – 29th November 2019

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# 15<sup>th</sup> International Conference on Culture Collections - ICC15 -

## Building Knowledge Based Societies

CONGRESSES VENUE:

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CAMPUS PUCÓN

[www.iccc15.ufro.cl](http://www.iccc15.ufro.cl)

## PUCÓN – CHILE

## 25<sup>th</sup> – 29<sup>th</sup> November 2019



November is  
Summer time in  
Chile!



WFCC BOARD (2017-2020)

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Map Not To Scale