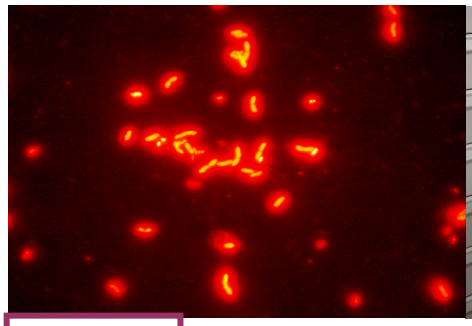
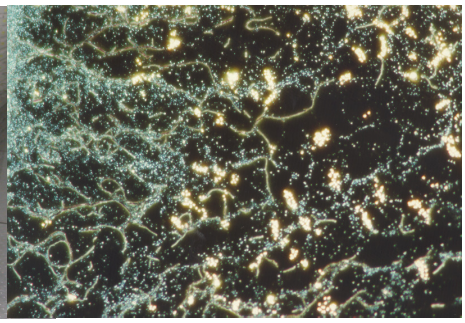




WORLD FEDERATION FOR CULTURE COLLECTIONS
Newsletter–JANUARY 2009

ICCC-12 CONFERENCE FIRST ANNOUNCEMENT

The World Federation for Culture Collections would like to invite you to the 12th International Conference on Culture Collections (ICCC-12) to be held in Florianópolis, Santa Catarina, Brazil from September 26 to October 1st, 2010. The conference will include plenary sessions, workshops, contributed papers, posters and round table sessions and will be held at the Costão do Santinho International Events Centre. Further information on the ICCC-12 Conference on "**Biological Resource Centres: gateway to biodiversity and services for innovation in biotechnology**" is available at http://www.iccc12.info/

Topics will include:

- Challenges in the Preservation of Global Biological Material
- Microbial Resource Centers as Infrastructure for Innovation in
- Science and Technology
- Legal and Safety Issues
- Quality Management, Certification and Accreditation of Biological
- Resource Centres
- Information and Communication Technologies and the Management of
- Resource Centres
- Biodiversity Conservation, Sustainable Use and Benefit-Sharing:
- Challenges and Practical Solutions
- Cutting-Edge Developments in Microbial Taxonomy and Ecology
- International Collaboration

Plan now to attend this premiere event and meet with your colleagues from around the world to discuss the latest technological and scientific developments in the field.

To receive further information on the ICCC12 conference, pre-register now at: http://www.iccc12.info/preregistration

NEWS FROM THE PRESIDENT

Report on World Federation for Culture Collections Activities

David Smith, President WFCC, CABI Bioscience UK Centre, Egham, Surrey TW20 9TY UK

The World Federation for Culture Collections (WFCC) was founded in 1968 and is a federation of the **International Union of Microbiological Societies (IUMS)** and a commission of the **International Union of Biological Sciences (IUBS)** with responsibility for the promotion and development of collections of cultures of micro-organisms and cultured cells (http://www.wfcc.info). Member collections of the WFCC register with the World Data Centre on Microorganisms (WDCM; www.wdcm.org). There are currently 546 collections in 67 countries registered. The WFCC keeps members informed on matters relevant to collections in a regular Newsletter published electronically and available on the WFCC web site (www.wfcc.info) and 2007 saw the publication of 2 issues (Numbers 43 and 44). The Federation's eleventh International Culture Collection Conference was held in October in Goslar, Germany. There were 19 different topics of scientific issues covered with almost 300 attendees from 47 countries, the website provides information on this successful meeting (http://www.iccc11.de). The programme can be viewed there and the proceedings downloaded from http://www.iccc11.de/files/Proceedings.pdf.

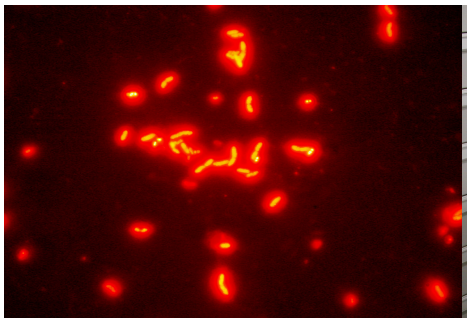
ICCC11 Resolutions

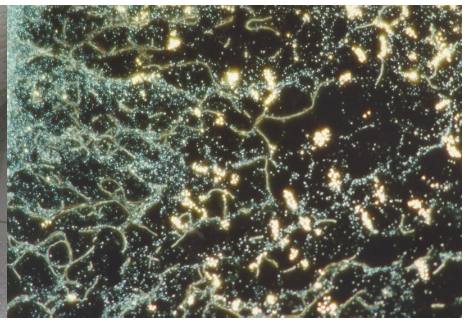
At each International Conference the participants are asked to prepare and endorse resolutions that will form part of the WFCC activities and goals for the period to the next conference (now 3 years) at ICCC11 these were:

1. WFCC will take a leading role in the development of the Global Biological Resource Collections Network to facilitate collaboration between Culture Collections.
2. WFCC will improve its capacity building efforts exploring new tools (e.g. e-learning).
3. WFCC will make an effort to propose a standard minimal MTA safeguarding the interest of all stakeholders
4. WFCC will make an effort to create a workable solution for curators to aid in risk assessment imposed by biosecurity regulations (dual-use). It will also keep a watching brief on related matters including the EU Green Paper on Bio-preparedness.
5. WFCC will collaborate with initiatives such as Straininfo.net and Mycobank to improve the quality and validity of strain data placed in the public domain
6. WFCC will work with ICSP (International Committee for Systematics of Prokaryotes) to deposit long-term preserved type strains of fungi in minimal two different collections in different countries.
7. As type strains are the property of the international scientific community the WFCC will work to ensure they remain available to qualified workers without restrictions or impediment.

The activities of the WFCC work programmes throughout 2007 focussed on:

- Postal, quarantine and biosafety regulations: the WFCC was invited to actively contribute to the first international WHO meeting focusing on the efficient transport of infectious substances (WHO HQ, Geneva, 12. – 14. December 2007). The WFCC commented on the European Biosafety Association (EBSA) paper to the UN Expert Group (UN/SCETDG/32/INF.32) on Shipping Dangerous Goods which requested the establishment of a new group of hazardous organisms for shipping purposes. They viewed plant pathogens as a problematic group which needed special treatment. The WFCC advised them that proper packaging limited any risk presented by them and also pointed out that it would be difficult to provide a list of pathogens as what may be a threat in one country may not be in another where the host is not present. The same EBSA document dealt with the packing requirements for genetically engineered microorganisms postulating that Packing Instruction PI913 shall be deregulated or replaced by PI650, the Packing Instruction for UN 3373 (biological substance, category B) that would be adequate for safety level 1 GEMs. The WFCC has observer status at the UN Expert Group and will continue to monitor the situation.
- Quality matters: The WFCC continued to input to the **OECD Biological Resource Centre Task Force** who held a workshop in Paris in December 2007 to draft a policy document and outline the next steps towards the establishment





of the Global Biological Resource Centre Network. 2007 saw the publication of the OECD Best Practice for BRCs *OECD Best Practice Guidelines for Biological Resource Centres (Online),* http://www.oecd.org/dataoecd/6/27/38778261.pdf. Accessed December 01, 2007.

- Capacity building: Two training courses were held (one on identification, the second on management and QM issues) in conjunction with ICCC 11 in Goslar, Germany in October 2007.
- *Ex situ* biodiversity conservation and Convention on Biological Diversity (CBD): There continue to be Access and Benefit Sharing (ABS) issues regarding genetic resources. The WFCC provided input to the ABS debate at and ABS Experts Meeting, Tokyo 8-9 February 2007 Access and Benefit Sharing Experts Meeting, Tokyo February 2007 and subsequently through a paper for COP9: Smith, D. & Desmeth, P. (2007). Access and benefit sharing: a main preoccupation of the World Federation of Culture Collections. In: UNEP/CBD/WG-ABS/6/INF/3 13 December 2007 Compilation of submissions provided by parties, governments, indigenous and local communities and stakeholders on concrete options on substantive items on the agenda of the fifth and sixth meetings of the ad hoc open ended working group on access and benefit sharing. Canada: UNEP/CBD, p 68-70.
- World Data Centre for Microorganisms: The WDCM continues to expand now having data for 546 collections in 67 countries.
- Endangered Collections: The committee received another call from the *Phytophthora* Genetic Resource Collection (PGRC) of the University of California (UCR) who have been under threat for several years. They are once again in danger of being closed. Lobbying continues at various levels for this collection. In the last 4 years, 23 collections, most funded by Governments (at least in part) have been lost. Two further collections applied for short term assistance in 2007 (the Indonesian Centre for Biodiversity & Biotechnology (ICCB) and the University of Indonesia Culture Collection (UICC) and were the recipients of successful awards from the SfAM Endangered Culture Collection Fund. This included visits from WFCC Task Group members who provided on the spot advice and guidance. A major collection of actinomycetes at the Centre for Biotechnology in Havana, Cuba and an important general collection in the University of Odessa in the Ukraine has recently been awarded further SfAM grants and have been/will be visited in 2008.
- Board meetings were held in Braunschweig in March 2007 and at the ICCC11 where both the old and newly elected boards met.

Other key activities of 2007 were:
The WFCC Skerman Award for Taxonomy was bestowed on Dr Wen-Jun Li of Yunnan Institute of Microbiology, Yunnan University, China at ICCC11. The Award was established to honour the contribution made by Professor V. B. D. Skerman to the WFCC with the aim to encourage taxonomic research by young microbiologists and to reward excellence in research and significant contributions to the discipline. Professor Hideaki Sugawara retired from his post at the National Institute of Genetics and was awarded the inaugural WFCC Medal for distinguished services to the WFCC. As a result of his work in 2007 the WFCC website was overhauled and given a more modern and user friendly design.

The WFCC continues to try and inform the scientific community on biological resource issues for example: Smith, D, & Rohde, C. (2007) Biological Resource Centres and compliance with the law. UK: Society for Microbiology (published on line at SGM).

WFCC Information Resource on International Postal Regulations for Shipping Biological Materials The current UPU regulations and their background published on the WFCC website.

The Annual General Meeting held at ICCC11 endorsed the restructure of the WFCC membership fees to reflect countries GDP and elected a new board:

- David Smith, President
- Ken-ichiro Suzuki, Vice President
- Christine Rohde
- Philippe Desmeth
- Joost Stalpers
- Juncai Ma
- Peter Green (Treasurer)
- Chantal Bizet
- Nelson Lima
- Gina Koenig

- Lindsay Sly
- Vera Weihs

Ex officio:

- Past President: Jean Swings
- WDCM Director: Hideaki Sugawara

Financial position

The WFCC remains solvent but with insufficient funds to meet all its objectives, the strategic plan for the next three years will focus on improving income to enable key activities to be funded. It currently has just over $40,000USD but has commitments to underpin the next International Conference to be held in Brazil in 2010.

Summary

The WFCC continues to work hard for the benefit of its members and is keeping a close involvement in the development of the Global BRC Network in order for it not to duplicate efforts and also to enable its members to benefit from its establishment. The WFCC continues in its endeavours to be proactive, be more involved in policy making in the areas of conservation and utilisation of genetic resources and work closely with legislators and policy makers to enable practical solutions to be put in place that can be implemented.

REPORTS

THE GLOBAL BIOLOGICAL RESOURCE CENTRE NETWORK AND THE WORLD FEDERATION FOR CULTURE COLLECTIONS

David Smith and Dagmar Fritze GBRCN Secretariat, Julius Kühn-Institut (JKI), Bundesforschungsinstitut für Kulturpflanzen (Federal Research Centre for Cultivated Plants), Institute for Crop and Soils Science, Bundesallee 50, D-38116 Braunschweig
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The OECD BRC initiative to establish the virtual infrastructure of the Global Biological Resource Centre Network (GBRCN) has taken a significant step forward towards reality. The German Ministry of Science and Technology (BMBF) have funded the establishment of the GBRCN Demonstration Project Secretariat in Braunschweig. The office opened on 1st December 2008 at the Julius Kühn-Institut (JKI), Bundesforschungsinstitut für Kulturpflanzen (Federal Research Centre for Cultivated Plants), Institute for Crop and Soils Science. The Secretariat has been established to deliver elements of the GBRCN vision as proof that it will add to existing activities and not simply duplicate them. Currently in post are David Smith, Dagmar Fritze, Dunja Martin and Susan Smith.

The WFCC will continue to play an important role in the development and performance of the GBRCN. The Secretariat will report to a Governing Council which will include the BMBF, OECD, WFCC and representatives of the user community. The Secretariat of this demonstration project is charged to deliver six work packages that focus on: BRC quality management and implementing common standards and protocols; common approaches explored to implement agreed principles on biosafety, biosecurity, risk assessment, ownership and management of IP enforced by existing national legislation, regional and global conventions and regulations; BRC and network long-term sustainability; Capacity Building in Information Technology; Securing a project portfolio for delivery of added benefits from the network and to help secure its sustainability. Current partner countries are: Belgium, Brazil, Canada, China, Finland, France, Germany, Italy, Japan, Kenya, Netherlands, Portugal, Spain, Uganda and the UK. The project will establish common approaches, practices, policy, procedures in collection, management and use of microbial diversity. The objective is to establish an infrastructure that will encourage collections to meet high quality operational standards, provide mechanisms for their compliance to international conventions and their national regulations and establish an associated capacity building programme that all culture collections can benefit from. Although it is the full intention of the future GBRCN, as defined by the OECD, to include all biological materials from animal, human, microbial and plant origins, this demonstration project deliberately focuses on microorganisms. However, it will endeavour to establish links to similar initiatives in other biological domains.

The Task Force established by the OECD member countries and which included 10 observer countries from the beginning, reported in 2000 (http://oecdpublications.gfi-nb.com/cgi-bin/oecdbookshop.storefront). The report argued the need for biological resource centres, strengthened and

modified to meet the requirements of the 21st century, and recommended the creation of a GBRCN. The subsequent years concentrated on developing operational guidance that would deliver high quality materials and associated data in a legal and operational framework that met national rules, regulations, legislation and conventions. In 2007 the results of this seven year activity were published, *OECD Best Practice Guidelines for Biological Resource Centres (Online),* http://www.oecd.org/dataoecd/6/27/38778261.pdf. It is intended that culture collections adopt these practices to ensure that users get legitimate and safe access to high quality biological materials and associated information. How these best practices might be adopted was left open and the GBRCN demonstration project will look at mechanisms for their implementation alongside existing formal systems with independent third party assessment. Partners in the GBRCN demonstration project will help formulate a common approach. Initially this will be supported by working closely with the **E**uropean Consortium of **M**icro**bia**l **R**esource **C**entres **EMbaRC** (a project funded to start in February 2009 within FP7-INFRASTRUCTURES -2008-1, INFRA-2008-1.1.2.9 programme, Biological Resources Centres (BRCs) for micro-organisms as a Combination of Collaborative Projects and Coordination and Support Actions for Integrating Activities) and other key initiatives, for example, in Brazil and the Asian Consortium of Microorganism Collections (ACM).

Increasingly, molecular techniques are being used to characterise strains to assure organism authenticity. Unfortunately some databases contain erroneous data that can undermine research. A study by Bridge *et al*. (2004) revealed that of 206 named sequences of the ribosomal RNA gene cluster in fungi up to 20% were considered unreliable. PCR fingerprinting techniques have been used to demonstrate that poor freeze-drying and cryopreservation technique can induce polymorphisms in preserved fungi (Ryan *et al*. 2001). Users are faced with the problems of different access controls, uncertainty of product quality and gaps in coverage, where can they get exactly what they need? Working with projects such as EMbaRC, EDIT and SYNTHESYS, the German Government sponsored GBRCN demonstration project will show how synergies between collections, centers of supportive skills and initiatives will underpin the developing bioeconomy and better meet customer needs. The SYNTHESYS project goal is to facilitate access to Natural History Collections by funding study visits, networking activities, capacity building and training. The SYNTHESYS 2 project starts September 2009, continuing some of the activities of the first phase but includes a research element on extraction of DNA from preserved specimens offering an opportunity for collaboration in this field along with the EMbaRC project. Further information can be found on the project web site http://www.synthesys.info. EDIT has some overlapping objectives but its main objective is the implementation of standards, institutional integration, collaborative research, cyber-taxonomy and streamlining bar-coding. There are so many initiatives, projects and organisations with overlapping goals that it is difficult to keep track of them individually. It would be desirable to co-ordinate outputs to avoid user confusion and it is hoped the GBRCN Secretariat can help link at least some of these that impinge on the conservation and use of biological resources.

A concerted effort is needed to support the development and long-term sustainability of culture collections so that they may support global research and development. The establishment of a consortium agreement that complies with member collections national needs and regulations can facilitate access to biological materials, ensuring compliance with access and benefit sharing requirements. It is imperative that the furtherance of science and the search for new tools in healthcare, food security, environmental protection and eradication of poverty must not be impeded by impractical and cumbersome barriers. It is imperative that outputs from, for example, the European Culture Collections' Organization discussions on a common text for a model MTA are utilized. The GBRCN could provide a safe, compliant and secure environment for legitimate exchange and use of biological materials.

This work will complement that of the WFCC and offer a mechanism for the implementation of many of its principles. However, not every collection in the world would wish to become a BRC or find the investment necessary to do so. The WFCC will continue to provide the umbrella for all these collections. The GBRCN will not be an exclusive club, but what is paramount is that the BRCs are established to meet current best practice; they are equipped well and have personnel that can achieve the key criteria that will form the 'threshold' level for membership of the GBRCN to enable the supply of high quality biological materials and information needed to underpin research and development. These three criteria are:

- **A**uthenticated materials– identified correctly and fit for the particular purpose defined
- **B**est practice implemented to preserve the biological materials by techniques that can ensure their long-term availability and stability

- **C**onfirmed and validated information on the distributed biological material

The delivery of these three criteria (the 'ABC' of BRCs) requires several things:

- National investment in facilities and a supporting budget
- Training of staff
- Provision of tools and technologies to enable performance of role
- A business plan for operation

The GBRCN Secretariat will work towards the establishment of a capacity building programme that enables these objectives.

The WFCC will continue to be the innovative force behind the GBRCN and the GBRCN will be able to offer a mechanism to implement resulting principles and practices on a global scale.

References

- Bridge, P.D., Spooner, B.M. & Roberts, P.J. (2004) Reliability and use of published sequence data. *New Phytologist* **161**, 15.
- Ryan, M J., Bridge, P.D., Jeffries, P. & Smith, D. (2001). Developing cryopreservation protocols to secure fungal gene function. *Cryoletters* **22**, 115-124.

Access and Benefit Sharing: A microorganism's perspective

David Smith[1], President of WFCC
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Background

This paper examines the possibility of a sectoral approach to access and benefit sharing in the access and use of microorganisms.

Microorganisms

"Microorganisms" comprise all prokaryotes (archaea and bacteria), some eukaryotic organisms fungi, including yeasts, algae, protozoaon-cellular entities (e.g. viruses), their replicable parts and other derived materials e.g. genomes, plasmids, cDNA. They are considered ubiquitous and found everywhere not recognising country boundaries although many do have various physiological requirements or are obligate pathogens or symbionts and don't grow everywhere. However, it is becoming more apparent that the environment in which a particular species is found has impact on its chemistry and properties.

Fifty percent of the living biomass on the planet is said to be microbial and microorganisms have the potential to provide solutions to many problems in agriculture, industry, plant, animal and human health and several other biotechnological applications. The vast majority (95%) of microbial diversity is yet to be discovered. They are involved in nutrient recycling (e.g. breaking down complex plant and animal remains), beneficial mutualistic relationships (e.g. nitrogen fixation, animal digestion, mycorrhiza), and production of atmospheric oxygen; some are pathogens causing disease of man, plants or animals. Their various properties can be harnessed by man for many uses which include the biological control of pests and diseases in agriculture and horticulture; production of natural products (e.g. valuable drugs, enzymes, and metabolites) for pharmaceutical, food and other applications, composting, bioremediation and detoxification of wastes. They play a major role in soil fertility and plant and animal health and are employed in diagnostics, efficacy testing of drugs, biocides, vaccine production and disinfectants or as reference strains. They are multifunctional and consequently have multi-use.

Many microorganisms can be maintained *ex situ* in culture collections; today 546 culture collections in 67 countries are registered with the World Federation for Culture Collections (WFCC[1]), World Data Centre for Micro-organisms (WDCM[1]). One of the aims of the WDCM is optimal transparent dissemination of information. WFCC members contribute daily to the study, exploration and *ex situ* conservation of microbiological resources vital for humankind.

For sustainable balanced socio-economic use of biodiversity, including scientific research, it is necessary to secure sound and easy access to biological material and related information. To achieve a balanced implementation of the Access and Benefit Sharing concept, from a practical perspective, taking into

[1] See www.wfcc.info

consideration the technical developments, **the World Federation for Culture Collections pleads for the development of a simple, cost effective and efficient multi-purpose conveyance system that integrates tracking biological material as well as collecting, managing, and exploiting related information.**

The WFCC works towards the development of a balanced system as described in its paper to COP9 (Smith, D. & Desmeth, P. 2007[2]). Exchange of specimens must be accompanied by a Material Transfer Agreements (MTA) outlining well-defined property rights moving away from the static concept of ownership. European collections have agreed common text that could be used as a basis and thus a model for others to adopt. Ownership can constitute a "bundle" of use and decision rights that are attributed to a number of stakeholders / economic agents. It is a scheme allowing multi-ownership of a gradual level of use and decision rights. Several rights-owners determine use and access to resources. These rights can begin with basic access rights, encompassing research delivering outputs to the public domain, distribution on to third parties under the terms agreed and described in the MTA, exploitation rights to develop intellectual property and its ownership which may include reach through rights. It must be possible to track Microorganisms through the various transfers and recognised in the ultimate end product, be it a research publication or natural product derived from them. By registering its members through a unique acronym and numerical identifier in its official list and urging them to catalogue their microbiological resources, WFCC has developed a pioneering database system in the World Data Centre for Micro-organisms. This system allows the tracking of microbiological items. But it also allows the implementation of the CBD "Access and Benefit Sharing" principle since it can potentially retrieve all kinds of information about microbiological resources, including information related to the location and movements of the resource.

The culture collection acronym and its unique number facilitate access to data in multiple sources: scientific, technical, administrative, etc., for any kind of use: research, conveyance, resources conservation, etc. In effect once an organism is deposited in a WFCC member collection and assigned a number it can be traced right through all publications it is mentioned in to perhaps a patent deposit. Having organised the legal framework and the technical issues this paves the way to benefit sharing but ultimately, to reach a fair deal requires reliable valuation of resource and appropriate assessment of input to the end product. The value of microbiological items in monetary terms to date has been driven by the market.

A microbial sector approach to ABS

The implementation of the concept of assigned rights and duties to entitled stakeholders, the use of Global Unique Identifiers to enable tracking and notification of transfers of microbiological items combined with an appropriate valuation of the output from the microbiological resources and thus the benefits that need to be shared and by whom, make it possible for fair and equitable transactions between provider and users of microbiological items.

The envisaged process

In response to applications for access to microbial resources standard agreements are invoked (i.e. PIC, MTA, contracts) according to end use which transfers rights to the user whilst laying down the terms and conditions which will include mechanisms for benefit sharing.

- *Level of access and use*

Basic access rights – single use research delivering outputs to the public domain. Rights to multiply and store for future use (in multiple research uses delivering outputs to the public domain). Rights to pass to third parties under agreed terms of use.Exploitation rights to develop intellectual property, its ownership with reach through rights for benefit sharing to stakeholders.

The transfer agreement/contract could allow some or all of these rights under specific terms and conditions.

- *Terms and conditions*

Resources directly isolated or not deposited in a WDCM collection must be deposited in such a collection, the source information published and the strain number must remain with the strain to enable its tracking and

[2] Smith, D. & Desmeth, P. (2007). Access and benefit sharing, a main preoccupation of the World Federation of Culture Collections. In: UNEP/CBD/WG-ABS/6/INF/3 13 December 2007 Compilation of submissions provided by parties, governments, indigenous and local communities and stakeholders on concrete options on substantive items on the agenda of the fifth and sixth meetings of the ad hoc open ended working group on access and benefit sharing. Canada: UNEP/CBD. p 68-70.

linkage to outputs.

The ECCO negotiated MTA and the MOSAICC output can be used to lay down part of the terms and conditions and additional inclusions can then be negotiated.

- *Benefit sharing*

The mechanism and definition of what is fair and equitable benefit sharing depends upon the usage and activities undertaken with the resource. For most research activities and depositing in collections for distribution for research and education simply the publication associated data including key elements of experimental results giving a clear link to the source material (delivered if WDCM registered collection acronyms and unique strain numbers are used – made a requirement of both author and publisher) and making it available to stakeholders is as far as the benefits should extend for this use. The culture collection provides added benefit as the material is made available back to the (source) country of origin. Supply fees for biological resources for use in research would not be considered a benefit to share as such fees are essential to ensure the collections sustainability and therefore the continued availability of the deposited resources.

However, if the resources are made available with the purpose of commercial exploitation then access, milestone and royalty/license payments may be required. Currently, the levels of these are currently set by imperfect market forces. They could be preset for a consortium of supply collections at a level that respects the input value of the materials and that satisfies the principles of the CBD. A link to patents can be made again be ensuring the link is retained with the original WDCM unique identifier for deposits made as part of the patent process. Not all research and development work will result in patents but if citing the WDCM number is part of the process the link to source country is made.

- *Exchange between WDCM registered Culture Collections*

(1) to access the strain (2) to multiply and store (3) to further contribute to knowledge on the strain (4) to further distribute the strain to others under conditions that best guarantee the requirements under the CBD and (5) manage the strain (including its removal from the collection). The collection is allowed to transfer strains with these rights to other collections that operate to the CBD, and with some or all rights to other recipients under conditions of an MTA. This in simple terms describes an international conveyance system that the MOSAICS project is trying to implement.

Summary

The ideal test ground of such as system would be the GBRCN demonstration project. It would provide several benefits:

- An operational framework meeting legal requirements and offering confidence to both providers and users
- A mechanism of tracking and reporting use of materials
- A model system for other domains
- Mechanisms to ensure the long-term conservation of *ex situ* biological resources

Report on the latest recipient of the SfAM Endangered Culture Collection Grant

THE SUCCESSFUL COMBINATION OF REFERENCE CULTURE ACQUISITION AND THEIR USE IN APPLIED RESEARCH PROJECTS IN A UKRAINIAN CULTURE COLLECTION

Dr. Vasily Bayraktar
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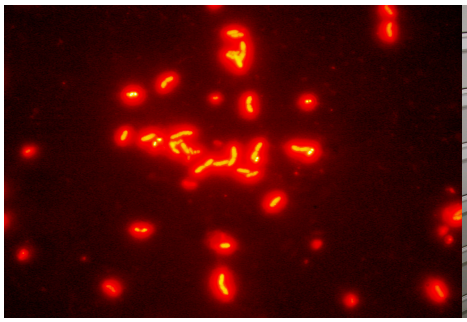
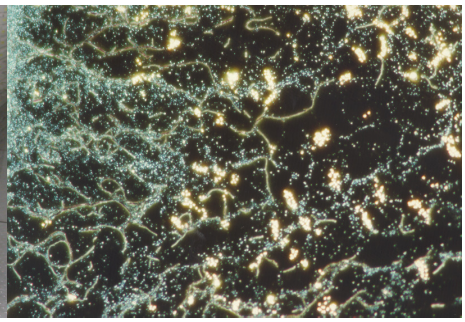
At Odessa National University, since 1998, and as a result of work with sufferers of chronic inflammation of the prostate, seminal vesicles and bladder; we began to isolate bacterial cultures and yeast from clinical samples in order to improve our understanding of these patients' diseases. Each isolated bacterial or yeast culture we purified and then lyophilized to save it in our fledgling collection aimed at building a core of reference material for other researchers to access and use.





After some time we decided to expand our small collection to include similarly isolated viruses and Chlamydia from a wide range of clinical samples. For such an expanded collection we began to use cell cultures [14],[15] from different animal tissue, which were very useful tools to aid the isolation and maintenance of live viruses and Chlamydia. From these beginnings we now hold now in our Cell Bank (culture Collection) a total of 106 cell lines which include suspension and monolayer cells. In our Cell Bank we keep cell lines from tissue such animals as monkey, mouse, mink, cattle, pig, horse, sheep, hamster, rabbit, dog, marsupial as well as some lymphoblastic and cancerogenic human cell cultures.

Thus, small though it is, our culture collection has developed along several lines or sub- sections. These include, cell lines from animal and human tissue - 106, yeasts - 1339, filamentous fungi - 28, actinomycetes – 64, non-clinical bacteria - 1218, clinical bacterial isolates – 2268, plasmids - 76, vectors - 9, genetically engineered bacteria – 123, phages - 40, viruses - 8. Our collection is served by experts in bacteriology, mycology, virology and cell culture, but all on a part time ad hoc basis.

Since the collection was established, we have supported a number of research projects in the above disciplines some of which are described briefly below.

1. Due to our virology program, we were able to isolate and cultivate viruses such as: herpes simplex virus type 1 and type 2, human herpes virus type 6, *Epstein Barr virus*, *Cytomegalovirus*, *Chlamydia trachomatis* LGV (*lymphogranuloma venerium*) and MU (male urethritis) [13].

2. Production of cultural and subunit herpes virus vaccine from vaccinal strains of herpes simplex virus type-1 and type-2.

Developing technology [12] for preparation of a subunit of human cytomegalovirus vaccine and testing this vaccine for immunogenicity in cell cultures.

3. Industrial production of pure L-amino acids.

Use of newly isolated strains [4], [11] of *Corynebacterium glutamicum* and *Corynebacterium ammoniagenes* which produces L-amino acids such as: L-histidine, L-valine, L- glutamine, glutamic acid, L-alanine, L-arginine, L-isoleucine and L-proline.

We optimized media for cultivated strains to maximize and purify amino acid production for these compounds.

4. Transformation of genetically engineered bacteria [1], [10] and yeast [3], [5], [6], [7], [8], [9], [16], which produce cytokines such as human interferon α, β, γ, interleukin 1,2,6,10 and tumor necrosis factor alpha and beta.

We successfully inserted key genes into plasmids and then transformed each plasmid separately into Escherichia coli K-12 [10], and *Bacillus subtilis* vectors [2], as well as specific strains of yeast. For this purposes we selected several different bacterial and yeast hosts. As a result we developed producers and super producers of cytokines which could be further developed on an industrial scale for use as a remedy for the treatment of several inflammatory diseases. These have a bacterial or viral origin and act to suppress pathogens and to increase and improve the immune system in the body and thus provide specific protection.

5. Helping to develop the technology [1], [13] for producing butanol involving the anaerobic cultivation saprophytic clostridia such as: *Clostridium acetobutylicum, Clostridium pasteurianum and Clostridium beijerinckii*.

6. Developing the technology [1], [13] of treating sawdust and wood residue from our native woodworking industry. This involved selecting organisms which could digest cellulose and lignin. Primarily strong enzyme producers were fungi such as *Sporotrichum pruinosum, Coniochaeta ligniaria and Cyathus spp.*

7. Isolation of yeast strains for the wine industries which are able to acid-wash wine. Specific isolation of yeast strains which assisted in the production of vintage wines of high-quality and excellent taste.

8. Optimization of the level of production of the anti-cancer antibiotic bleomycine [1], by *Streptomyces*

mobaraensis, Streptomyces stramineus, Streptomyces verticillum and use of this antibiotic for the transformation of a yeast species with a plasmid. This transformed yeast was capable of producing 100 mcg/ml bleomycine.

The grant provided by the SfAM was greatly received form Dr Peter Green, Chair of the WFCC Endangered Collection Task Group, who visited our collection in September of this year. We also appreciate Dr Green's advice during his visit. This grant will go towards the urgent purchase of a minus 70°C freezer to protect and back up many of our vital strains and lessen the risk of loss as some key isolates will now be preserved by more than one method.

Acknowledgements:

Our collection was also supported by our colleagues from different countries by gratis donations of bacterial, yeast, fungi, actinomycetes and plasmids and we are especially grateful to:

1. Dr. Cletus P. Kurtzman, Dr. Alejandro Rooney, Dr. David Labeda, Dr. Kerry O'Donnell.

NRRL Collection - Microbial Genomics and Bioprocessing Research Unit, National Center for Agricultural Utilization Research, Peoria, IL, USA.

2. Dr. Daniel R. Zeigler, The Ohio State University, Bacillus Genetic Stock Centre, USA.

3. Dr. Yoshinobu Kaneko, Yeast Genetic Resource Center (National Bio-Resource Project of the MEXT, Japan), Osaka University, Japan.

4. Dr. Ryuji Kawakita, HUT Culture Collection, Department of Molecular Biotechnology, Hiroshima University, Japan.

5. Genetic Resources Management Section, National Institute of Agrobiological Sciences, Tsukuba, Ibaraki, Japan.

6. Dr. James Cregg, Keck Graduate Institute, Claremont, CA, USA.

7. Dr. Kathleen L. Gould from the Biology Department Vanderbilt University, Nashville, USA.

8. Dr. Jean Marc Nicaud, Laboratory of Microbiology and Molecular Genetics, Thiverval – Grignon, France.

9. Dr. Jan van der Kiel, Molecular Cell Biology, University of Groningen, The Netherlands.

10. Dr. Maxim Filipenko, Laboratory of Pharmaco-genomics, Research Institute of Chemical Biology and Fundamental Medicine, Novosibirsk, Russia.

11. Dr. Vera Popova, Laboratory Microbiology of Yeast, Research Institute of Hydrolysis, Saint-Petersburg, Russia.

12. Dr. Natalia Karajas, Laboratory of Epidemiology opportunistic infections, Research Institute of Microbiology and Epidemiology, Moscow, RF.

13. Dr. Mirja Puolakkainen, Department of Viral Diseases and Immunology, KTL, Helsinki, Finland.

14. Dr. Galina Polyanskaya, Laboratory of Cell Cultures, Research Institute of Cytilogy, St. Petersburg, RF.

15. Dr. Tatyana Galnbek, Laboratory of Cell Cultures, Research Institute VIEV, Moscow, RF.

16. Dr. Svetlana Markova, Research Institute of Biophysics, Krasnoyarsk, Russia.

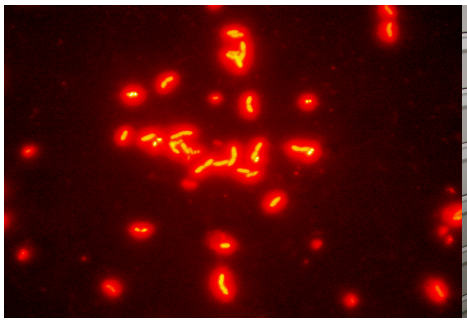
Report on the VTCC workshop Funded by the SGM international Development Fund 22-23 October 2008, Hanoi, Vietnam

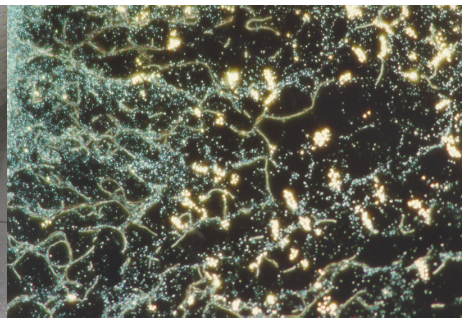
VTCC, Curator
Dr. Duong Van Hop

Venue: Institute of Microbiology and Biotechnology (IMBT), Vietnam National University, Hanoi.

Introduction of VTCC establishment and activities

Vietnam, an agricultural country with a population of 82 million, recognizes the significance of biotechnology as a priority area for its development. In fact, Vietnam has been found to have significant potential for developing some areas of biotechnology. However, there is a big gap when comparing this regional country with the rest of the world. Located in South-East Asia, Vietnam has a potential advantage with its largely untapped local biodiversity. Some novel endemic animals and many plants have been discovered and studied/protected, but very little attempts have been made with regard to microorganisms. Vietnam possesses many endemic ecological areas: hot springs, mangroves, and has a sub-





tropical and tropical climate. In addition, there are 54 minority groups of people dwelling here who produce a range of very diverse traditional fermented products.

To sustainably support biotechnological development, the establishment of a culture collection of microorganisms plays an important and fundamental role as a key source of essential reference material. In recognition of this, steps were taken to set up a loosely affiliated Vietnamese National Collection Network. All activities geared towards building up the Vietnam Type Culture Collection (VTCC) in particular, has been conducted at IMBT (Centre of Biotechnology), Vietnam National University (VNU) Hanoi since 1996 with a funding of 2 million USD from the government and annual finance from the Ministry of Science & Technology. All facilities are available for fundamental research of microbial diversity. Cultures held are maintained using conventional methods and are r identified as part of the accession process.

The VTCC culture collection houses around 6500 cultures (bacteria, yeast, filamentous fungi, actinomycetes, micro-algae). Around 1200 cultures have been well documented in the form of an electronic catalogue for many users. All collected cultures are documented and screened based on application, whether or not they are a type culture (both foreign and domestic), whether they are bioactive compound producers (e.g. enzymes: amylase, protease, cellulose chitinase, phytase; producers of antibiotics, fungicides, bactericides, or have antivirus and anti-tumour properties, or produce plant growth modulators (IAA), or used for redeveloping bioproducts in agriculture or are potential environmental pollution treatment candidates (probiotics, mixed-microbial consortia for urban solid waste treatment).

The needs for, and the useful points of, the workshop.

At this moment, there are 12 staff members (4 PhDs, 5 Mscs and 3 Bscs) working at VTCC. All of them were trained in the field of general microbiology, but none of the staff were trained in management of a major culture collection. In fact many lack the fundamental knowledge in culture collection management. For international development in microbiology and biotechnology in the future, VTCC needs to be upgraded to a National Bioresource Centre (NBRC). In this respect, VTCC needs expert advice to improve the quality of all culture collection management, hence the great need for the current culture collection management workshop funded by the SGM International Development Fund.

The workshop conducted at VTCC, IMBT, VNU on October 13-14 was extremely useful and highly relevant, covering and addressing key areas of collection management. The workshop was conducted by three experienced UK Scientists who have been working with microbes and culture collections for their entire careers:

- Dr. PN. Green (Curator, NCIMB, Aberdeen).
- Dr Barry Holmes (Curator, NCTC, CPHA, Colindale, London).
- Dr. Paul Kirk (Senior Mycologist, CABI Bioscience, Egham).

Attending at the workshop, there were 15 participants who from key culture collections in Vietnam. These included representatives from:

- Fungal collection (National Institute of Plant

Protection).
- Culture collection for agriculture (Institute of Soil Science).
- College of Pharmacy Microbial Collection, Hanoi.
- VTCC.

Content of the lectures given in the course can be summarized as follows:

- The lecture programme and round tables were designed according to local needs and dealt with several aspect of collection management including:
- How to set up a culture collection according to World Federation of Culture Collections (WFCC) guidelines.
- How to operate and manage a culture collection
- Preservation techniques for bacteria and fungi
- Isolation and preservation of filamentous fungi
- The role of quality assurance in culture collections.
- Postal and packaging regulations and biosecurity

Impact of the Convention on Biological Diversity (CBD) and Material transfer Agreements (MTA's) on culture collections.

During the course, many questions from the participants were answered by the speakers. All attendees found the course so useful and of interest in their current roles. We would like to thank the three tutors who kindly gave of their time and provided clear and convincing explanations during the workshop. They also willingly agreed to answer any follow up queries by E-mail in case of future needs. All participants look forward to further workshops on this topic in the future.

Acknowledgement:

As curator of VTCC, I would like to thank Dr. PN .Green, Dr. B. Holmes, Dr. P. Kirk for providing friendly and informative lectures at the course and to Dr Green for organising the course. Especially we wish to thank the Society for General Microbiology for funding the workshop and in providing VTCC with useful Taxonomy Books (Bergey's Manual of Systematic and Evolutionary Bacteriology, Volumes 1, volume 1,2,3,4, as well as two text books on bioinformatics and molecular evolution).

The CEN Workshop Agreement (CWA 15793:2008) and its consequences on science and research

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The Laboratory Biorisk Management Standard CWA 15793:2008 was published by CEN, the European standardization office, in February 2008 and since then has the status of a publically available reference document. The 47 page document is the agreed result of the third plenary meeting of CEN Workshop 31 held in Brussels, 28th and 29th November 2007, following a 60 day public consultation phase. The CWA document can be purchased from the national standardization offices and has a three year "lifetime" without any possibility of modifications during this time. However, after that it will be decided if the document should 1.) remain as it is and upgrading it to the status of a standard, 2.) undergo a "translation" or 3.) be withdrawn. Therefore, it is very important that as many institutions as possible worldwide test the realistic applicability of the CWA and to determine if it is overkill. It seems quite probable that the document will receive the status of a standard. At the moment, the title of the document is to some extent misleading as it is not yet a standard. Furthermore, the document is published by CEN and the three CWA workshops were supported by CEN and the European Commission, but by no means is the document "European", it is designed for global application, for all labs working with biological material or biogenic toxins. It offers best practice guidance covering biosafety and biosecurity (= biorisk). The document does not provide technical details but is "performance-based". It aims at complementing the WHO documents on biosafety (Laboratory Biosafety Manual, 3rd edition) and on biosecurity (WHO/CDS/EPR/2006.6). WHO, OECD and other international organizations and consortia such as the EBRCN have not only published several guidance documents or best practice guidelines on biosafety, but also on biosecurity. Biosafety and biosecurity are closely related, in most countries biosafety is well-regulated whereas biosecurity is much more complex to regulate. There is awareness and recognition of biosafety issues and additionally, biosafety has a solid legal basis because of containment and protective measures. However, biosecurity has a comparatively poor legal

status (see BTWC, Australia Group) because critical knowledge transfer, ethical responsibility and a code-of-conduct reflect the biosciences in a different way. Export control lists of organisms that have potential for misuse exist e.g. in the EU Dual-use regulation EC/394/2006 and respective national laws but lists are not sufficient for implementing biosecurity. A consensus document like CWA 15793:2008 aims at offering helpful guidance for developing processes in the biosecurity context, but the question remains if control over science can control bioweapons? Therefore, in the era of a biotechnological revolution freedom of the biosciences is touched by terms like dual-use. Most CWA-critical comments focused on the apprehension that smaller institutions or universities cannot implement the CWA because of lack of financial resources. Also, the CWA was designed to be ISO-compatible and postulates ISO certification wherever possible; this means institutions should prepare themselves for putting in place an ISO management system. This causes a lot of justified concern; in the future ISO-certified institutions will realistically be privileged, but ISO certification is impossible for many research units such as Universities. However, the CWA does not need to be fully implemented in every laboratory. Individual labs should determine to what extent the CWA is applicable for them. Reviewing the implementation of the document should help discover weaknesses in an institution's practices (identify and control risks) and prevent misuse of biological resources, data and know-how (facility protection). It is critical that additional personnel will be required to implement the CWA on a broad basis. Primarily, this should be articulated on the political level and throughout national scientific societies. It should be emphasised that the final CWA was agreed upon in consensus by 76 workshop members and that it was greatly supported by WHO in order to complement the a.m. WHO guidelines. The first initiative in the process of designing a CWA had also been strongly supported by ABSA, EBSA and DNV. What is the role of CWA for culture collections? It is certainly an additional helpful tool. The OECD Best Practice Guidelines on Biosecurity for BRCs (2007) positively demonstrate the extent to which BRCs are involved when it comes to questions regarding bio-legislation. The pros and cons of the CWA should be carefully weighed and comments on the document should be directed to the CEN management centre or CEN Workshop 31 Secretariat. Careful consideration of the practicalities of such a document could prevent the scientific community from unwanted burdens. NEN, the Netherlands Standardization Institute, holds the CWA Workshop secretariat (www.nen.nl, contact persons Marcel de Vreeze: Marcel.deVreeze@nen.nl or Sophie Franssen: sophie.franssen@nen.nl).

Culture Collections and Compliance with the Law

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A modern Culture Collection or Biological Resource Center (BRC) has to consider compliance with a wide variety of laws and guidelines to operate under safe and secure conditions. The specifics of the laws and guidelines vary by geographic area, but there is a general agreement on the fundamental principles that are important as best practices.

For example, the World Health Organization' Laboratory Biosafety Manual (http://www.who.int/csr/resources/publications/biosafety/WHO_CDS_CSR_LYO_2004_11/en/) agrees well with the Centers for Disease Control and Prevention Biosafety in Microbiological and Biomedical Laboratories.

The OECD Best Practice Guidelines for BRCs includes a section on Biosecurity, which agrees well witht the Laboratory Biorisk Management Standard proposal put forth by the International Biorisk Standard Development Initiative. Both recommend a risk assessment and risk management approach.

What has been enacted into law varies by country. In the United States, congress has enacted a series of laws to regulate Select Agents, starting with the Antiterrorism and Effective Death Penalty Act of 1996, then the Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism Act of 2001 (USA PATRIOT Act) and the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (the "Bioterrorism Act"). These laws rely on a list-based approach rather than on a risk assessment approach.

In Europe, an international group has proposed a Laboratory Biorisk Management Standard which has

similarities to the Select Agent Registration in the United States but does not recommend specific criminal penalties.

The analysis of the laws affecting Culture Collections and BRCs in countries around the world was presented at the IUMS in Istanbul, Turkey, 2008.

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FUTURES CONFERENCES

2009

BIT LIFE SCIENCES
April 5-7, 2009
Seoul, South Korea
2nd Annual World Congress of Industrial Biotechnology-2009
http://bit-ibio.com/program.asp

FEMS 2009
28 June-2 July 2009
Goteborg, Sweden
FEMS 2009 - Third Congress of European Microbiologists:
Microbes and Man - Interdependence and Future Challenges
htpp://www2.kenes.com/fems-microbiology/Pages/Scientific_Program.aspx

YEAST GENETICS
July 19-24, 2009
Manchester, UK
24th International Conference on Yeast Genetics and Molecular Biology
www.yeastgenetics.org

ISBA'15
August 20-25, 2009
International Convention Centre, Shanghai, China
http://www.isba15.org/

VIBRIO 2009
4-6 November 2009
Copacabana beach, Rio de Janeiro city.
http://b200.nce.ufrj.br/pggen/Vibrio2009.htm

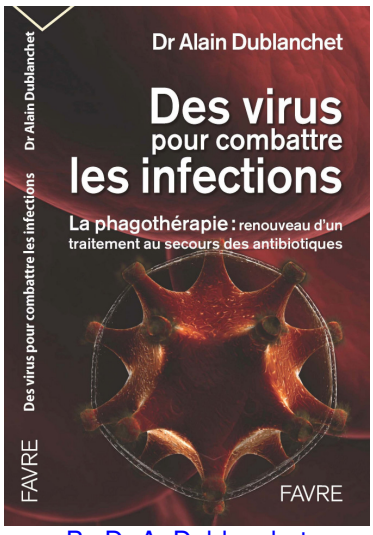
2010

GIM 2010
28 June-1 July 2010
Melbourne, Australia
www.gim2010.org

INVITATIONS

http://www.mdpi.com/journal/diversity/special_issues/eco-physiology

BOOKS



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