

EMbaRC

European Consortium of Microbial Resource Centres

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Deliverable D.4.38 (formerly D.NA3.1.2)

Title: A strategy for increasing collection holdings with scientifically relevant resources

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Start date of the project: 1st February 2009

Duration: 44 months

Organisation name of the lead beneficiary: DSMZ

Version of this document: V1

Dissemination level:

PU	Public	PU
PP	Restricted to other programme participants (including the Commission)	
RE	Restricted to a group defined by the Consortium (including the Commission)	

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Document properties	
Project	EMbaRC
Workpackage	WP 4
Deliverable	D.4. 3 8
Title	A strategy for increasing collection holdings with scientifically relevant resources
Version number	V1
Authors	Erko Stackebrandt
Abstract	Implementation of quality measures, compliance with the Convention on Biological Diversity (CBD), and adoption of latest bioinformatics tools are among the main steps to be taken by microbial culture collections in order to provide resources for the emerging area of the knowledge-based bioeconomy. These measures have to be introduced side by side with the deposition of increasingly phylogenetically and physiologically diverse microbiological organisms . However, the necessary expansion of human resources and infrastructure is moving slowly, if at all. Furthermore, considering that the vast majority of microbial isolates do not find their way into public collections, a strategy should be devised to encourage researchers to deposit a higher fraction of strains . It appears obvious that in order to make available an even broader range of diversity to users and researchers, collections will have to decide whether to diversify on a broad taxon spectrum of the hierarchic system, holding a small number of representatives per species, or to follow the route of focusing on in-depth holdings of selected groups of organisms, depending on existing taxonomic expertise. These decisions require a worldwide coordinated activity with the outcome to be made transparent to users in an emerging global network.
Validation process	Document prepared by INRA from articles written and presentations given by DSMZ.

As clearly explained in the presentation (slides in annex) the “**strain deposit**” if **one of the key question for the future of European BRC**. Three papers already published and presented below summarised the collective reflexion of the EMbaRC consortium to enhance in a clever way this deposit.. This implies the involvement of i) scientists themselves (a questionnaire was addressed to 3500 scientist in 49 countries), ii) of key actors like Editors of the 8 main European journals of microbiology (a specific meeting was organised in Braunschweig with them) in order to make recomandations in the Editorial policy regarding strain deposit criteria, and of course involmenet of iii) granting bodies as strain deposit has a cost.

1 Opinion article in *Trends in Microbiology*

Stackebrandt E., Diversification and focusing: strategies of microbial culture collections, *Trends Microbiol* (2010) 18:283-287. DOI:[10.1016/j.tim.2010.05.001](https://doi.org/10.1016/j.tim.2010.05.001)

2 Editorial in *Archives of Microbiology*

Stackebrandt E., *Arch Microbiol* (2011) 193:155-156. DOI:[10.1007/s00203-010-0675-4](https://doi.org/10.1007/s00203-010-0675-4)

3 Letter to Editor in the *International Journal of Systematic and Evolutionary Microbiology* (Open Access article)

Stackebrandt E., Towards a strategy to enhance access to microbial diversity, *Int J Syst Evol Microbiol* (2011) 61:479-481. DOI:[10.1099/ijs.0.027615-0](https://doi.org/10.1099/ijs.0.027615-0)

Significance of this deliverable

This deliverable is the first collective reflexion involving scientists and microbial journal Editors to define a shared strategy to improve the strain deposit in BRC a rationale way, making accessible for the future the more interesting microbial resources.

Annexes

Presentation given at Final EMbaRC Meeting, Braga, Portugal, 1st June 2012

Towards a strategy to enhance access to microbial resources

Erko Stackebrandt
DSMZ-German Collection of Microorganisms and Cell
Cultures, Braunschweig, Germany
June 1st. 2012



Presented by Sylvie Lortal, INRA Rennes

An EMbaRC activity, NA3.1
European Consortium of Microbial Resource Centres
Seventh Framework Programme, Research area: INFRA-
2008-1.1.2



Activity report 05.2011-05.2012

PP 3: Schematic illustration of strategy

PP 4-4: Summary of Braunschweig Workshop 02. 2011

PP 5-13: Recent activities (past 12 months)

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Towards an improved deposition strategy



Main outcome of the Braunschweig workshop 2011

Exchange of strains is dismal

1. Deposition of all strains is an impossible task
2. Definition of a "key" strain, e.g.,
 - Less than 98% 16S rRNA gene sequence similarity with the nearest type strain (conservative approach)
 - Significant differences in genome content (≈30%)
 - Novel pathway
 - Second strain of a single strain (type strain only)
 - Strain of sequenced genome, plasmid, phage
 - Under-represented taxa
3. Generate a questionnaire to authors
(distribution 3.500 to authors in 49 countries)

Result of questionnaire 2011

The evaluation is based upon 509 returned questionnaires (14.7%)

Evaluation Q1

In your opinion, is there a need to improve access to microbial resources?

YES: 86.8% (442 agree)

Evaluation Q3

Should journals publication guidelines request that strains with particular properties must be deposited in public strain culture collections in order to maintain them for further research?

YES: 79% (402 agree)

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Why do we need to know the number of resources to be deposited?

- BRCs/CCs need to react to increased deposition demands by improving infrastructure and personnel
- To provide granting bodies with facts, not feelings

In order to obtain information about the number of “key strains” the authors would like to deposit they must be asked directly at manuscript submission

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Strategy: Link a questionnaire to manuscript submission

May 2011: Contact with Springer Publisher, New York

Reaction: interesting

November 2011: Contact with Springer Publisher, Heidelberg

Reaction : interesting and justified, we should give it a try

but: optional, not mandatory as authors may submit papers to a different publisher

Start December 2011: with **Current Microbiology** and **Archives of Microbiology** using the MonkeySurvey (<http://fr.surveymonkey.com/>) online software

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The questionnaire (takes less than 5 min to respond to)

**Q1:Do you do research on microbial (bacteria, archaea, yeast, fungi) strains?
(Comment: the journals -slide 9- cover mostly Prokaryotes)**

Q2:Does your strain contain unique features that would make its long-term deposition desirable? Such as

- phylogenetic uniqueness
- metabolic uniqueness
- genomic uniqueness
- microorganisms, phages or plasmids with fully sequenced genomes
- a second strain of those species or subspecies for which only the type strain are available in public culture collections.

Q3:In case you marked at least one row with "Yes": are you interested in depositing this strain/these strains in a public culture collection?

Q4:How many strains would you like to deposit in a public culture collection?

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Journal reaction

Once it started, nobody wanted to be left behind

Journals now participating

*Systematic and Applied Microbiology

Journal of Medical Microbiology

*Microbiology

Environmental Microbiology Reports

*Environmental Microbiology

*FEMS Microbiology Letters

FEMS Microbial Ecology

Applied Microbiology and Biotechnology

Antonie van Leeuwenhoek

Microbial Ecology

*Extremophiles

*Current Microbiology

*Archives of Microbiology

Publisher-entry date

(Elsevier)-June 2012

(SGM, UK)-May 2012

(SGM, UK)-May 2012

(Wiley)-April 2012

(Wiley)-April 2012

(Wiley) -April 2012

(Wiley) -April 2012

(Springer)-March 2012

(Springer)-March 2012

(Springer)-March 2012

(Springer)-March 2012

(Springer)-Dec. 2011

(Springer)-Dec. 2011

*, included in 2009 survey on strain covered in published research (20.000)

No reaction from ASM (USA) journals: keep trying.

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Results so far (June 8th 2012)

Remember results of 2011 questionnaire

Is there a need to improve access to microbial resources? **YES: 86.8%**

Should journals publication guidelines request deposition? **YES: 79%**

2012 Journal questionnaire: The percentage of responding authors is unknown

The % weekly response in deposition is stable: increase of ~4% in 16 weeks



Of those who responded:

Q1: Do you research on microbial strains?

YES 86.5%

Q2: Do you do research on "key strains"; responses

Yes 74.6%

Q3: Are you interested in depositing "key strains" in a public culture collections?

Of those who responded to Q2

YES 48.3%

No 17.0%

Q3: Rational

Does your strain contain unique features that would make its long-term deposition desirable?

(yes answers [% per sub-question])

phylogenetic uniqueness	46.1%
metabolic uniqueness	37.1%
genomic uniqueness	19.7%
microorganisms, phages, plasmids.. with fully sequenced genomes	30.7%
a second strain of a species.....	31.7%

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Q4. How many strains would you like to deposit in a public culture collection?

So far about **600** strains

Considering that journals entered at different times, the average visibility month per journal with an active questionnaire is 3.5, the total number of strains per 12 months could be roughly **2.000**.

Number could be much larger if questionnaire is mandatory

Rough estimate:

World-wide not more than **5.000** strains/annum

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This activity and, above all, the contact with granting bodies for both, BRCs/CCs and Research will continue within the frame of MIRRI.

I thank Sylvie for guiding you through the presentation

Any question and comment please via erko@dsmz.de

Have a successful and pleasant stay in Braga, Erko

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