Contact: paolo.romano@hsanmartino.it

Extending MCL towards the needs of MIRRI

P. Romano [1], D.P. Colobraro [1], P. Dawyndt [2]

[1] IRCCS AOU San Martino IST, Genoa, Italy; [2] Ghent University, Ghent, Belgium

The actors

Interoperability of information systems of microbial domain Biological Resource Centers (mBRCs) is essential for the Microbial Resource Research Infrastructure (MIRRI) [1].

The Microbiological Common Language (MCL) [2] is used to exchange data between mBRCs and the StrainInfo portal [3].

MCL pitfalls and the objective of this work

MCL does not consider all the information sought by available guidelines (OECD [4], CABRI [5,6], MINE [7,8]). Moreover, it was designed for bacterial, yeast and fungal strains only.

A new version of the MCL, able to fully express contents of mBRCs catalogues, may be a reference format for data exchange in MIRRI.

Comparing standards

MCL and the CABRI guidelines has been compared. All CABRI data fields used by the majority of collections were considered. The comparison was limited to resource types properly described by MCL.

Objectives of the comparison were:

i) identifying equivalences and differences,
ii) identifying information for which the MCL language does not provide any tag,
iii) suggesting a list of new MCL tags able to incorporate the full contents of an mBRC catalogue based on the CABRI data sets.

The CABRI data sets for plasmids and phages were compared to MCL tags in order to:

i) identify which among existing MCL tags could be adopted for these resources,
ii) suggest new tags to cover missing data.

MCL tag (proposed in red)	CABRI field(s)	Resource type(s)
strainNumber	Strain_number	A, B, F, Y
collectionNumber	Collection_number	Pl, Ph
otherStrainNumber	Other_collection_numbers	A, B, F, Y
otherCollectionNumber	Other_culture_collection_numbers	Pl, Ph
speciesName		
qualifiedSpeciesName	Name Name + Infrasubspecific_name	A, B, F, Y A, B
resourceName	Name	Pl, Ph
otherName type="TYPE"	Other_names Misapplied_names	A, B F, Y
typeStrainOf	Status	A, B, F, Y
History	History	A, B, F, Y
History	History_of_deposit	Pl, Ph
Medium	Condition_for_growth	A, B, F, Y
Medium	Medium	Pl
Restrictions	Restrictions	A, B, F, Y
Restrictions	Restricted_distribution	Pl, Ph
organismType	Organism_type	A, B, F, Y
Type	Type	Pl, Ph
formOfSupply	Form_of_supply	A, B, F, Y

MCL tag (existing or proposed)	CABRI field(s)	Resource type(s)
Isolation	Isolated_from	A, B
sampleLocationCountry sampleLocationPlace	Geographic_origin	A, B, F, Y
sampleHabitat	Substrate	A, B, F, Y
Genotype	Genotype	A, B
Mutant	Mutant	A, B, F, Y
sexualState	Sexual_state	A, B, F, Y
Race	Race	F
Applications	Applications Virus_used_for Properties_and_Applications	F, Y Ph Pl
Properties	Properties_and_Applications	Pl
hostForDistribution	Host_for_distribution	Pl
hostForPropagation	Host_for_propagation	Ph
selectablePhenotype	Selectable_phenoype	Pl
Replicon	Replicon	Pl
hostRange	Host_range	Pl
hostUsedForPropagation	Host_used_for_propagation	Ph
Lysogenicity	Lysogenicity	Ph
cellSurfaceReceptor	Cell_surface_receptor	Ph
Publication	Literature	A, B, F, Y, Pl, Ph

Table of results. MCL tags (existing in black and proposed in red), corresponding CABRI fields and the resource types where they can be used. When a CABRI field cell is empty, the corresponding MCL tag does not have a direct equivalent in CABRI data sets. See also [9]. **Legend:** A: archaea, B: bacteria, F: filamentous fungi, Y: yeasts, Pl: plasmids, Ph: phages

Aknowledgements

The research leading to these results has received funding from the European Union's Seventh Framework Programme (FP7/2007-2013) under grant agreement no. 312251.

References

1. MIRRI: www.mirri.org
2. Verslyppe B et al. Research in Microbiology, 2010, 161(6):439-445
3. StrainInfo: straininfo.net
4. OECD Best Practice Guidelines for Biological Resource Centres (2007) www.oecd.org/health/biotech/oecdbestpracticeguidelinesforbiologicalresourcecentres.htm
5. CABRI Guidelines for catalogue production www.cabri.org/guidelines/catalogue/CPdata.html
6. Romano P et al. Applied Bioinformatics. 2005, 4(3):175-186
7. Stalpers JA et al. Systematic Applied Microbiol. 1990, 13:92-103
8. Gams W et al. Journal of General Microbiology 1988, 134, 1667-1689.
9. Colobraro DP et al. zenodo.org/record/154637