



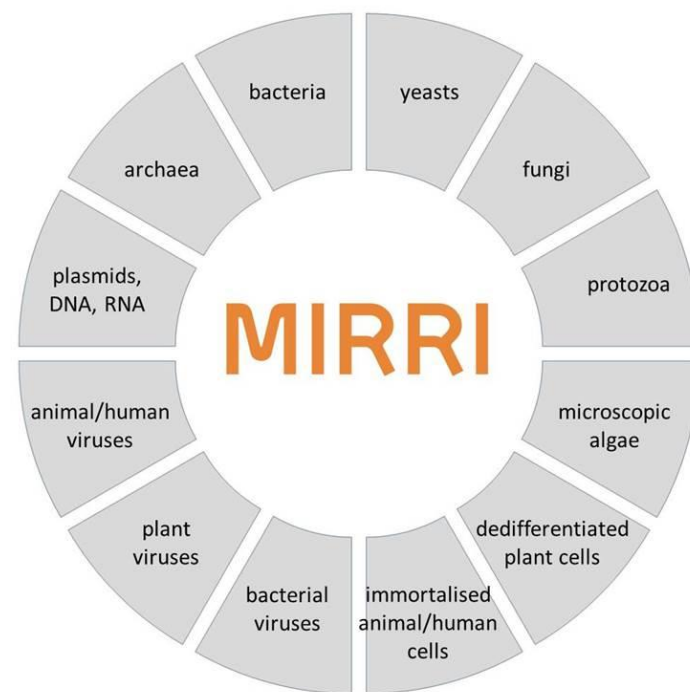
Microbial Resource Research Infrastructure: A large-scale research infrastructure for microbiological services

Microbiologie Clinique 2014

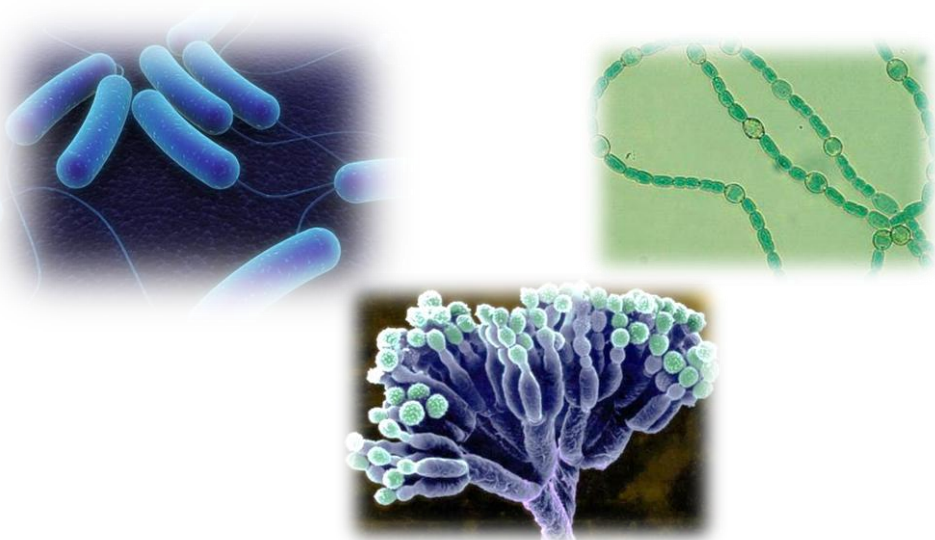
September 19th, 2014

The 21st century is the century of biotechnology and it could help into the discovery of the hidden potential of microbial strains.

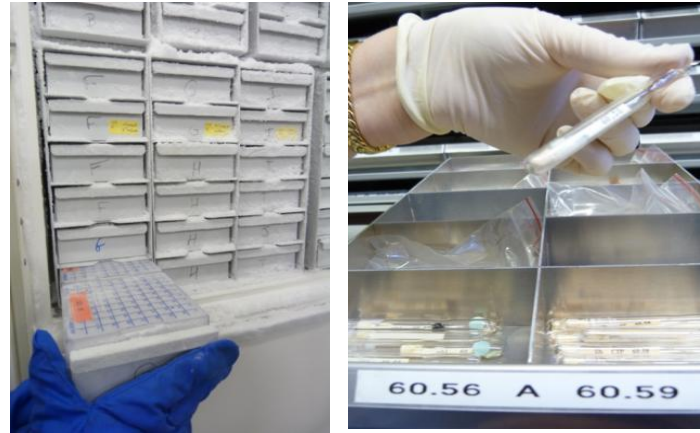
Area	Examples
Primary metabolites	amino acids, sugars, vitamins.
Secondary metabolites	antibiotics, anti-inflammatory and anti-tumor compounds
Alcohol	industrial ethanol, acetone, butanol
Recombinant DNA technology	amino acids production, insulin, growth factors
Enzyme production	urokinase (anticoagulant), L-Glutaminase (Anti-tumor), Superoxide dismutase (anti-oxidant, anti-inflammatory), ribo nuclease (antiviral), lipase (digest lipids).
Bioconverting-organisms	steroid bioconversions
Agricultural Biotechnology and Pest control	bioinsecticides
Microbial pigments	Pigments from Monascus, Rhodotorula, Bacillus, Achromobacter, Yarrowia and Phaffia
Food Biotechnology	citric acid, lactic acid
Vaccines	Hepatitis B
Antiviral drugs	Herpes virus, Hepatitis B and C



This large and diverse pool of microbial resources bring a boost of innovation to bio-industry as well as to research.



Depositing such valuable living resources in public Biological Resource Centres (BRCs) (culture collections), **ensure open but regulated availability.**



However, less than 1% of strains used in research, are deposited in public BRCs to ensure their long-term availability and controlled quality



Health, demographic change and wellbeing

Food security, sustainable agriculture and bio-economy

Inclusive, innovative and secure societies

Climate action, resource efficiency and raw materials

Secure, clean and efficient energy

Public budget constraints and there remains too much fragmentation and costly duplication.

Research infrastructures are considered as key elements to improve transparency, coherence and coordination of the global scientific research to address global challenges.

MIRRI is an initiative within the European Strategy Forum on Research Infrastructures (ESFRI), including public biological resource centres, supported by several European and non-European collaborating parties.



MIRRI partners in Europe

MIRRI intends to address the global challenges in many ways, by working with multidisciplinary partners, delivering to them the resources, tools and services needed to facilitate the discovery of solutions.

The MIRRI offer



coordination and
harmonisation of offers
and expertise

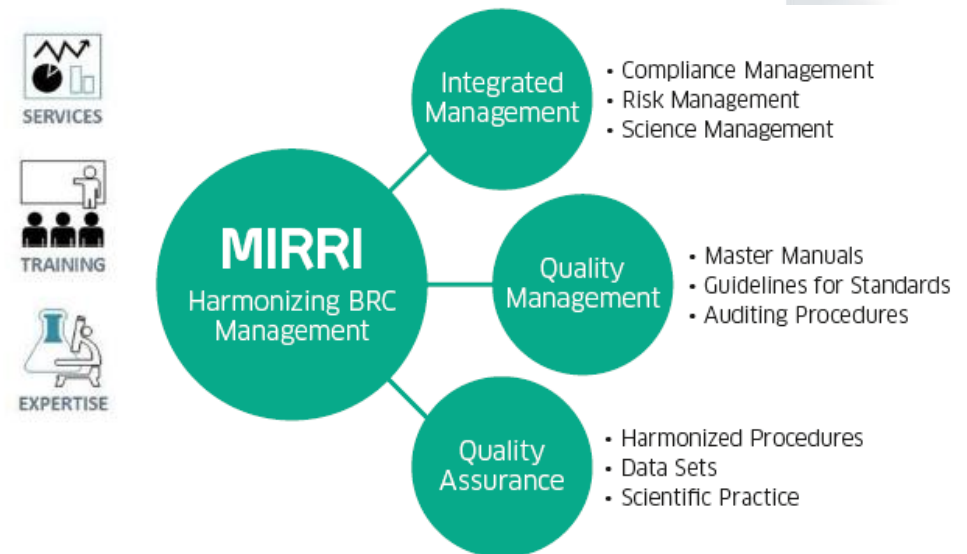
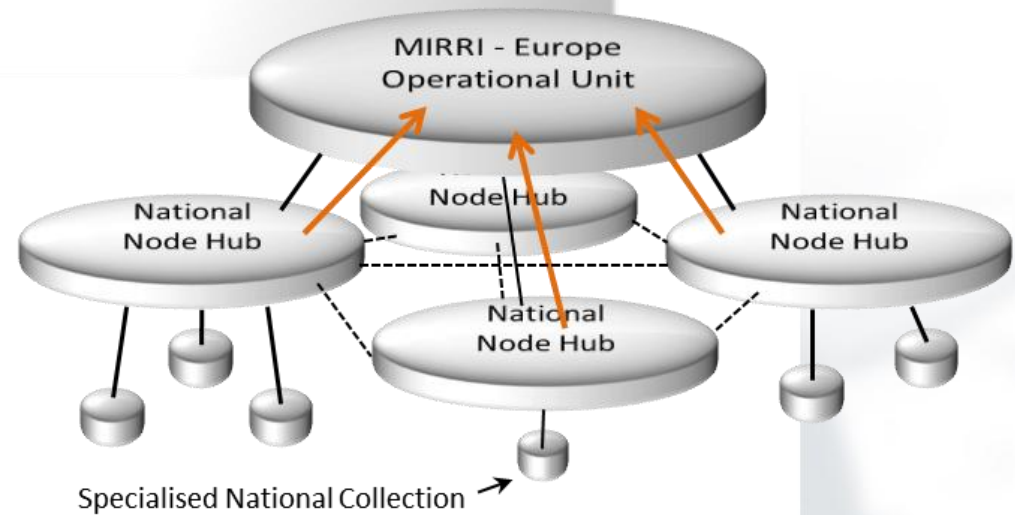
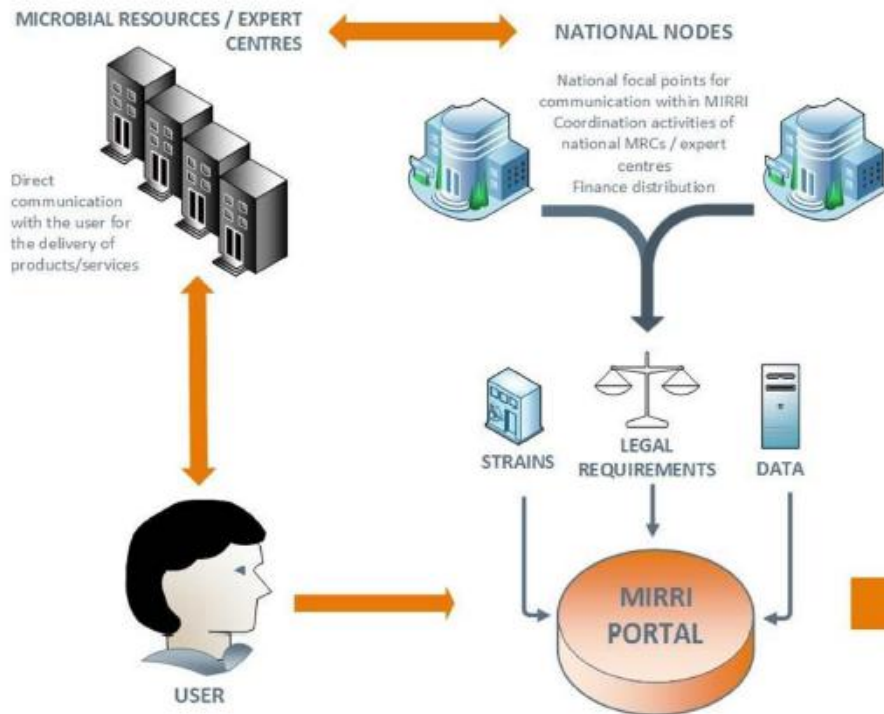
data management and standards
targeted coverage
quality standards
legal framework
reduced redundancy
cost effectiveness incl. improved
capacities
distributed platform of expertise
service centres, e.g. consultation
research to add value, e.g. targeted
isolation

MIRRI infrastructure and
national networks

- incentive
- predicted achievement
- expected result

Required an intense dialogue of MIRRI collection managers and funding authorities

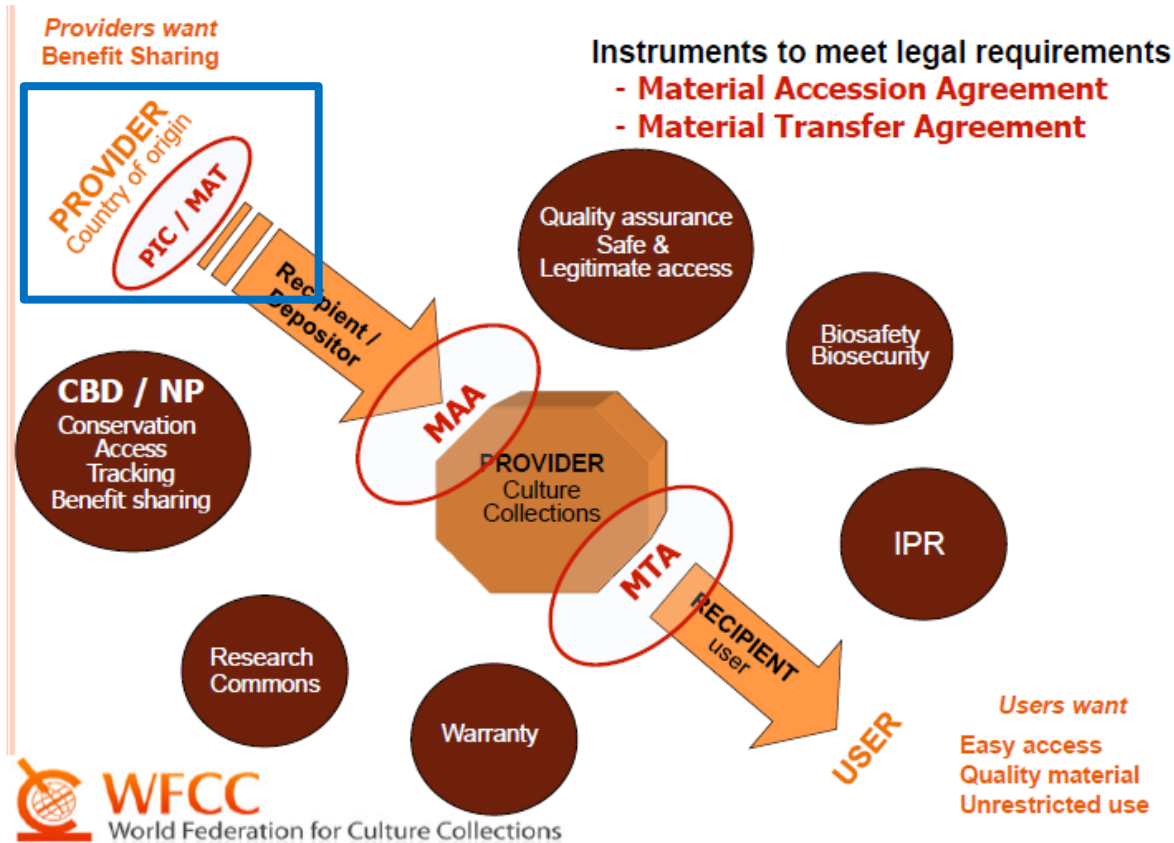
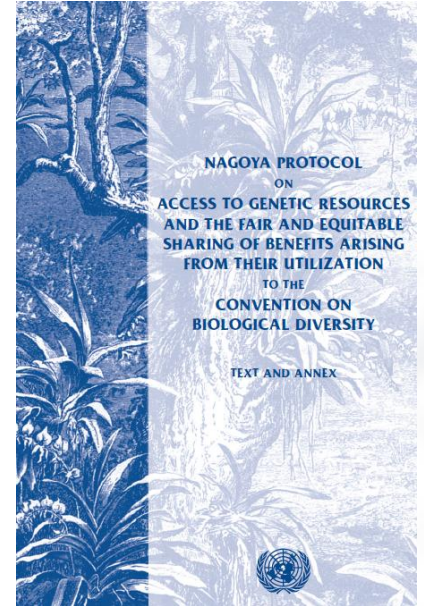
- **Build a truly coordinated European infrastructure**
- Distributed platform
- Harmonised offer
- Best practices



Assurance that MIRRI partner collections play their responsible role in the chain of information connected to the transfer of resources from the provider to the isolator



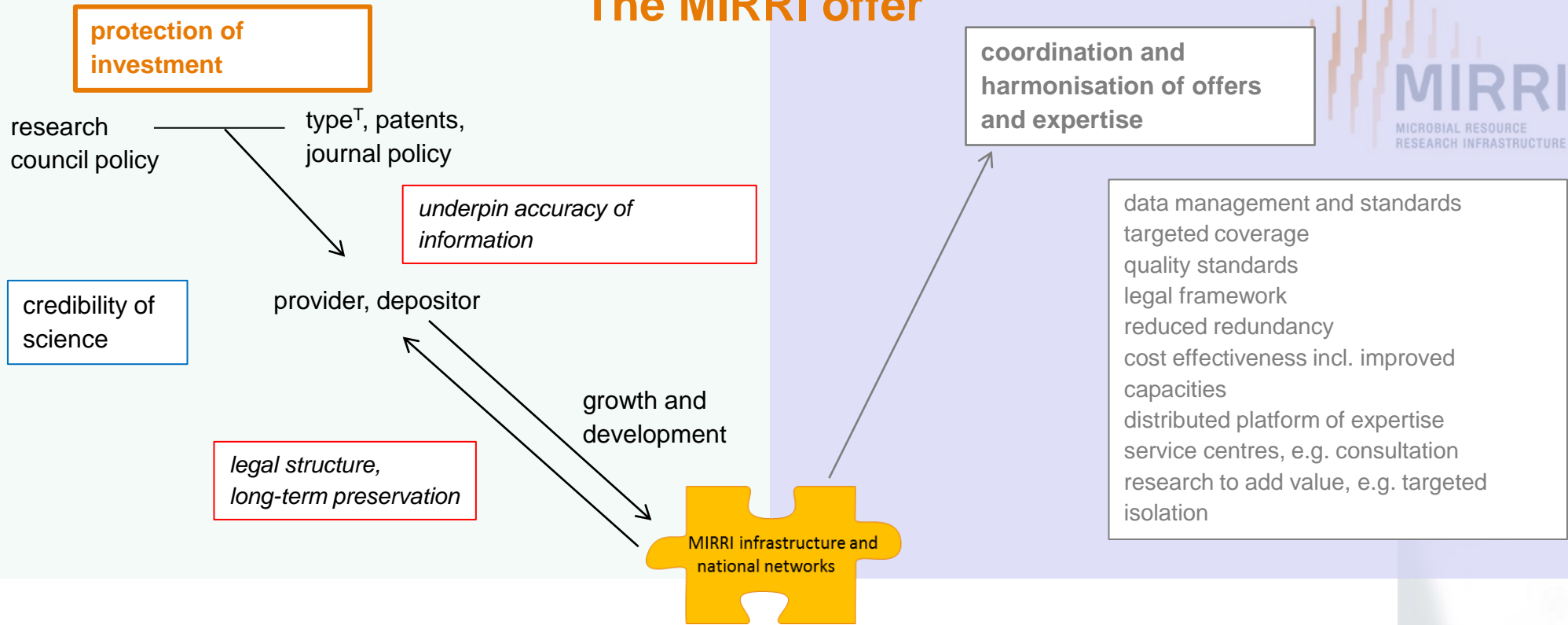
The Nagoya Protocol is an international agreement which aims to sharing the benefits arising from the utilization of genetic resources in a fair and equitable way.



The concern for the scientific community and for the BRCs about the entry into force of the Nagoya Protocol, is that the deposits will severely decrease.

- **Prior Informed Consent**
- **Mutually Agreed Terms**

The MIRRI offer



- - incentive
- - predicted achievement
- - expected result

Investment spent by research agencies supporting research on microbiology safeguarding key microbial resources



ANNOUNCEMENT

Reducing our irreproducibility

Over the past year, *Nature* has published a string of articles that highlight failures in the reliability and reproducibility of published research (collected and freely available at go.nature.com/huhbyr). The problems arise in laboratories, but journals such as this one compound them when they fail to exert sufficient scrutiny over the results that they publish, and when they do not publish enough information for other researchers to assess results properly.

398 | NATURE | VOL 496 | 25 APRIL 2013

Lacking microbial material impedes building on previous knowledge and past discoveries, and in fact makes the value of many published data questionable, **since independent confirmation is not possible** (Jassens, 2010).

Further confirmation needed

A new mechanism for independently replicating research findings is one of several changes required to improve the quality of the biomedical literature.

VOLUME 30 NUMBER 9 SEPTEMBER 2012 NATURE BIOTECHNOLOGY

Depositing cultures in a public **BRC** has a significant selective effect; **100% more citations** of papers in which strains have a collection deposit number (Stern, 2008).

Six red flags for suspect work

C. Glenn Begley explains how to recognize the preclinical papers in which the data won't stand up.

A few months ago, I received a desperate e-mail from a postdoctoral scientist. Researchers — including me and my colleagues — had just reported that the majority of preclinical cancer papers in top-tier journals could not be reproduced, even by the investigators themselves^{1,2}. The postdoc pleaded with me to identify those papers, saying: "I could be

wasting my time working on that project." This was true, but we had signed confidentiality agreements that prevented us from revealing the specific papers. Furthermore, identifying them would not address the broader, systemic issues in research and publishing that create a plethora of papers that don't stand up to scrutiny. There were some glaring differences ▶

Limited. All rights reserved

23 MAY 2013 | VOL 497 | NATURE | 433

The MIRRI offer



protection of investment

research council policy

type^T, patents, journal policy

underpin accuracy of information

credibility of science

provider, depositor

legal structure, long-term preservation

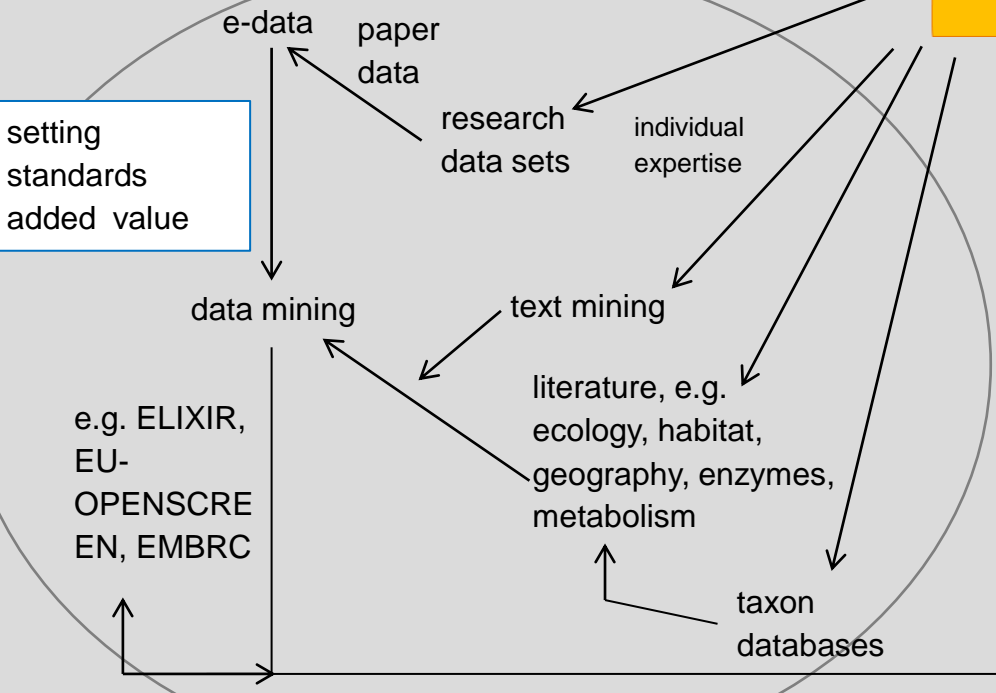
growth and development

MIRRI infrastructure and national networks

coordination and harmonisation of offers and expertise

data management and standards
 targeted coverage
 quality standards
 legal framework
 reduced redundancy
 cost effectiveness incl. improved capacities
 distributed platform of expertise
 service centres, e.g. consultation
 research to add value, e.g. targeted isolation

setting standards added value



holistic approach to data management and use

- - incentive
 - - predicted achievement
 - - expected result

Strain information scattered in different mBRCs, databases and the scientific literature must be identified, sorted, curated, made interoperable and provided by an open platform to serve the users needs.

Strain associated data have not a common implementation due to the heterogeneous and incomplete datasets.

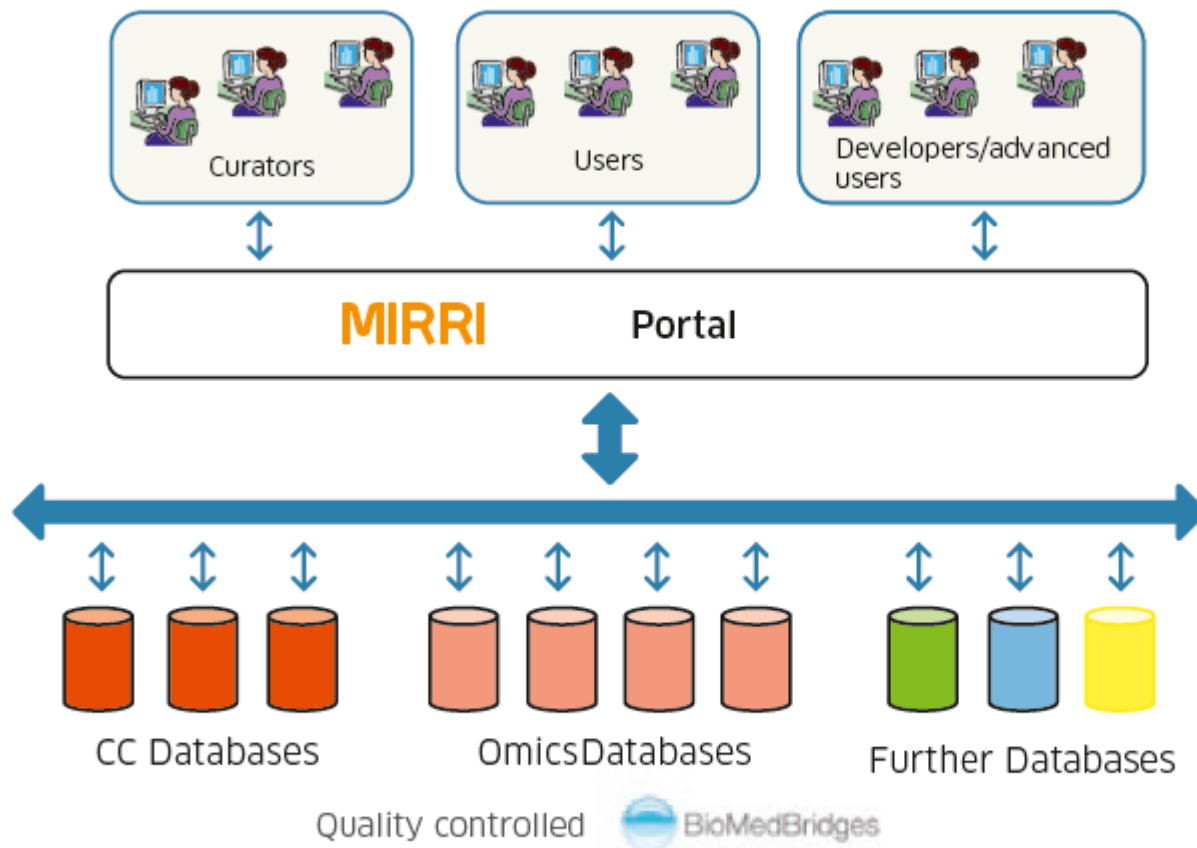
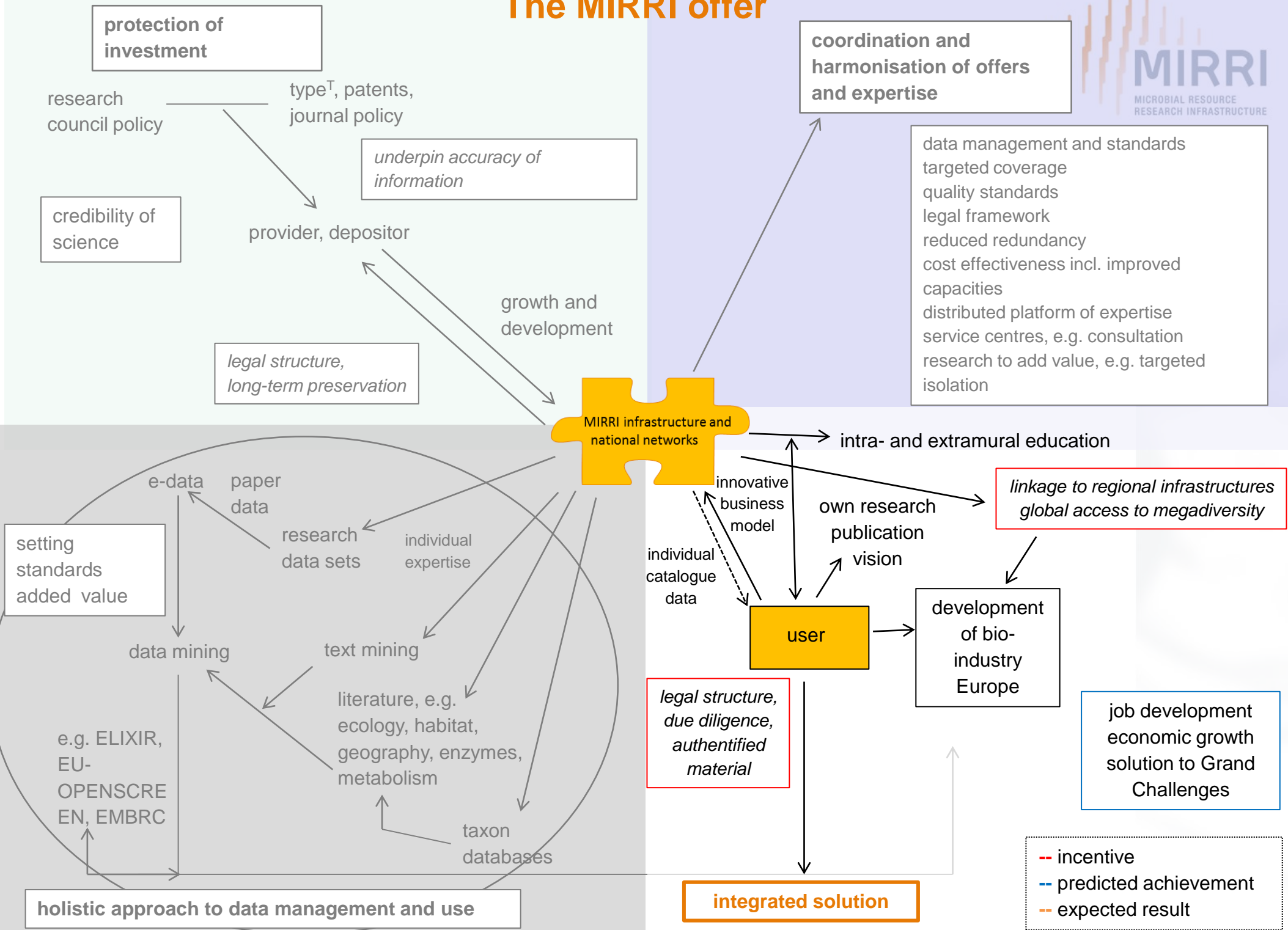


FIGURE 8.1: VISION OF THE MIRRI INFORMATION SYSTEM (MIRRI-IS) PROVIDING ACCESS TO INTEGRATED, QUALITY CONTROLLED INFORMATION AND ASSOCIATED CONTEXTUAL DATA (METADATA) ABOUT A PARTICULAR BIOLOGICAL RESOURCE.

The MIRRI offer



Defining the place of MIRRI within the European landscape of users of resources and other stakeholders



Surveys: resource holders/providers and the microbial resource users

ECCO-CC Survey
60 ECCO members

High level of interest in and cooperation with MIRRI

cooperation with MIRRI
High level of interest in and

Users Survey

1200 replies from profit and non-profit sectors

Biological Material sent:

- 69% non-profit
- 31% profit

- 31% profit
- 69% non-profit

Innovative Services Survey
Potential users (Bio-industry)

- 1/3 of respondents indicated not to be current customers of mBRCs/CCs → Potential Users
- 65% of responders services currently offered by mBRC/CCs are sufficient for their work

- 65% of responders services currently offered by mBRC/CCs are sufficient for their work
- 1/3 of responders indicated not to be current

Ongoing

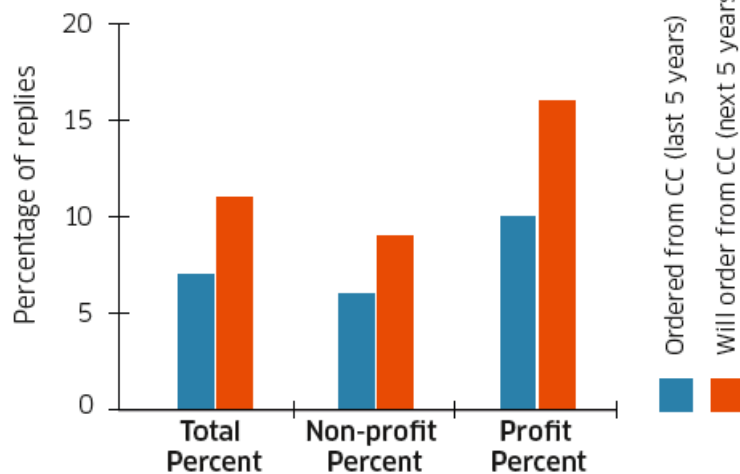
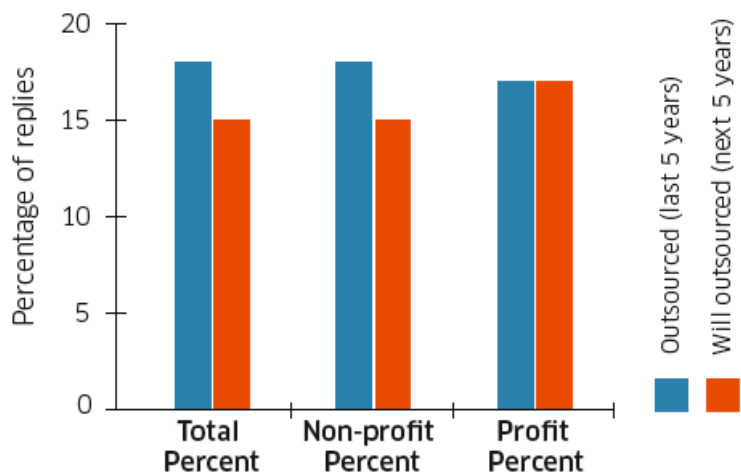
Non-ECCO-CC Survey
158 CCs

- 40% of the laboratories supply samples to third parties upon request
- 36% share resources in specific cases (e.g. collaborative research)
- 24% not at all

- 24% not at all

collaborative research) 14

Training



Link with other ESFRIs (BMS group)



MIRRI's success depends on input and feedback from *researchers, users as well as providers of microbial material, bio-industries, policy makers and national authorities*

Contact us via info@mirri.org

To be informed about the latest news about MIRRI,

Visit our website (www.mirri.org) or

Join us in the social media

