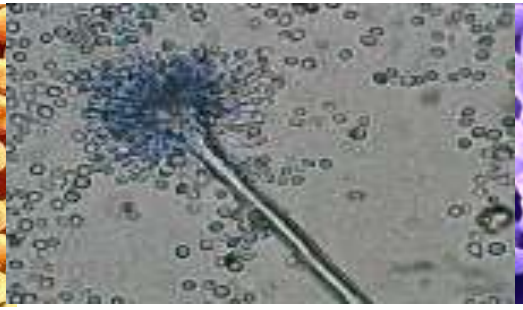
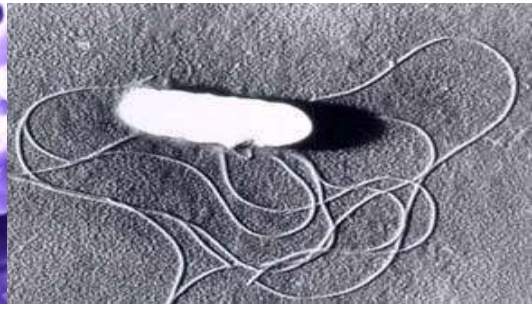
EMbaRC

European Consortium
of
Microbial Resources Centers



Cantacuzino Institute, Romania, March 2010

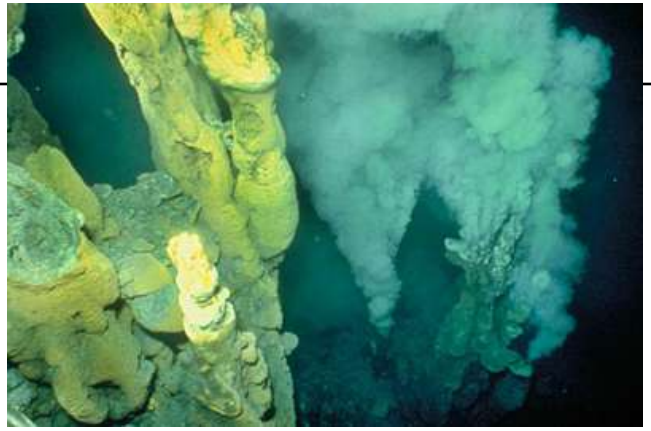
Thank you !

1. Microbial **biodiversity**
2. Collections, state of the art in Europe
3. EMbaRC project, partners and main expected achievements
4. Conclusions and our meeting today !

In soil ….

Key role in recyclying (C,P,N,S..)

In water



Extreme biotopes …..

In human ..

In the air …..

Microbial biodiversity is an extraordinary source for innovation

… carbon, nitrogen cycles**,** depolluting, essential in agriculture and food ; produce components like hormones, vitamins, antibiotics…essential for digestion…

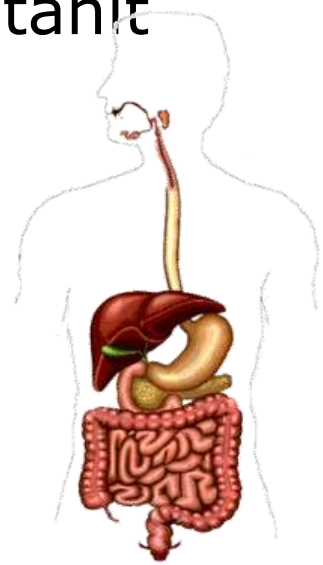
All metabolisms represented

= richness to keep and explore
large potential of added value

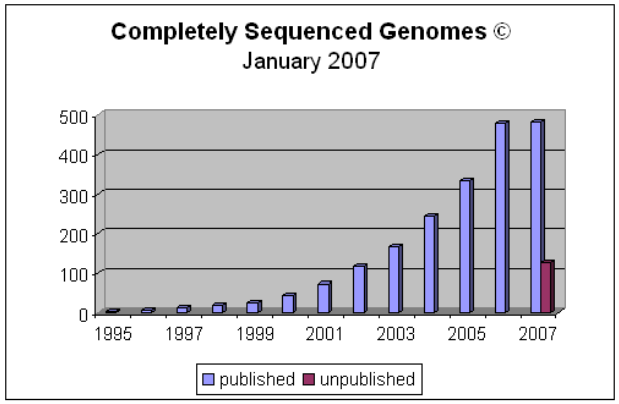
Microbes = **first source of genes in the planet** !
underexplored until recently

Metagenomic programs by international research consortiums
Soon a more complete view of the microbial diversity = revolution

Metahit

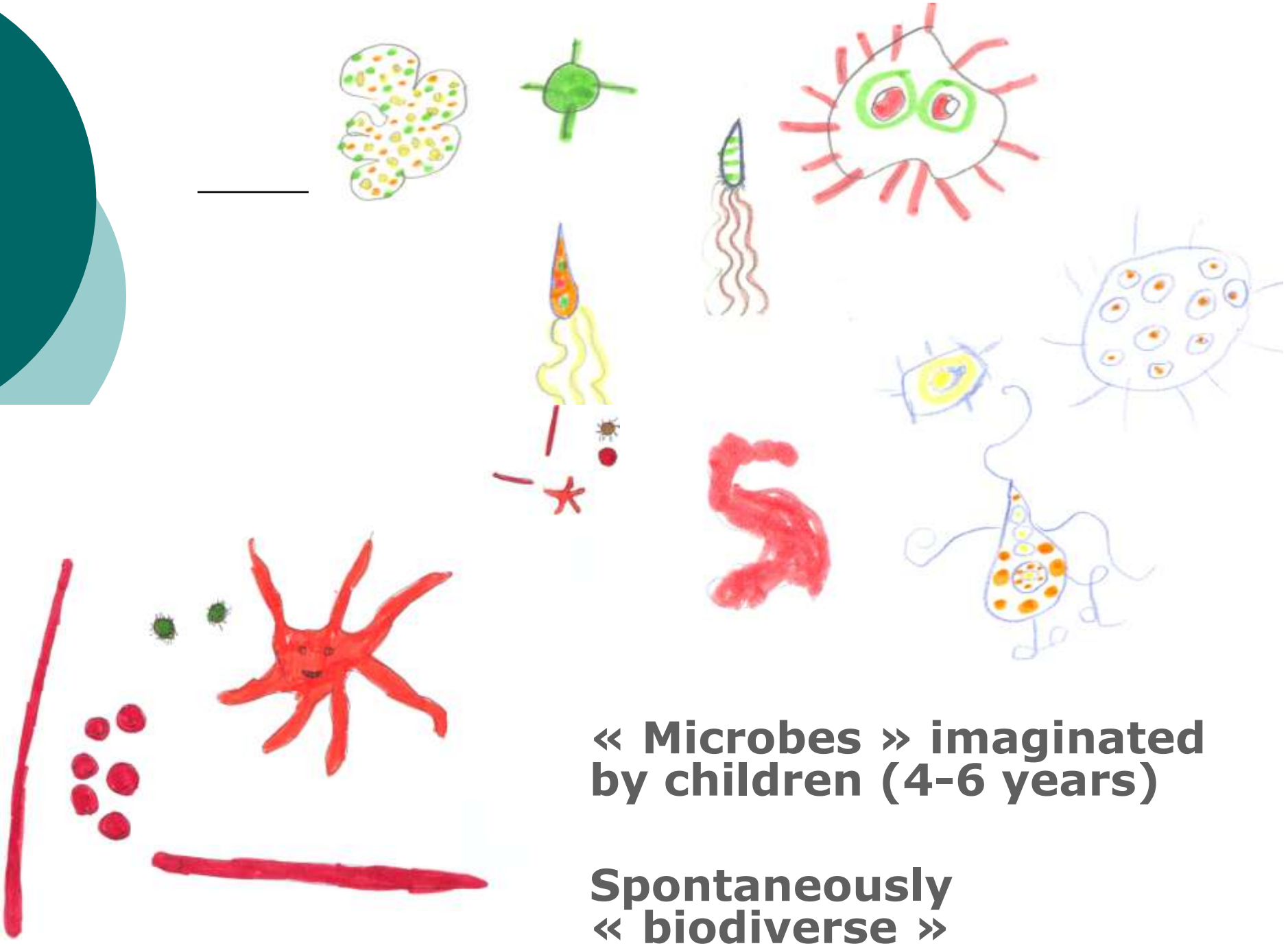


Interaction with diet, links with obesity



Terragenome

70 % of antibiotics are coming from soil bacteria, from a very small fraction <0.1%



« Microbes » imaginated by children (4-6 years)

Spontaneously « biodiverse »

FAO / Commission on genetic resources for food and agriculture

Rome, session oct. 2009, twelfth regular session

« Agricultural production (plants and animal growth) depends **heavily** on µorg biodiversity; they provide also a broad range of beneficial services in food processing + emerging use in forestry and fishery sectors; some non beneficial »

Trends for the conservation and exchange and uses …

FAO, background study paper n°46

It is the historical mission of culture collections to organize the collection, the authentication, maintenance, distribution of strains of microorganisms.

The use of certified materials from culture collections **diminishes the costs from mistakes in cumulative research** (Furman and stern, 2006) and **decreases the search costs for finding appropriate materials** (Visser et al., 2000)

The situation of culture collections is characterized by a high level of interdependancy. The largest collection (25000 strains) hold less than 2% of the total nb strain holdings

Biological resources of high quality are essential for high quality research

- Concept of Biological Resource Center (Tokyo, 1999)
- True also for microorganisms, in particular of course for reference strains

State of the art in EC ?

EC has many collections, more or less « official » in the field of agriculture, health, biotechnology, fermented foods, **covering a large biodiversity**

EC has only one structure at the European level « ECCO » European Culture collections organisation (350 000 strains, existing since 1981)

promote collaboration and exchange of ideas, informations about culture collection activity (meetings)

This patrimony is not well structured and interrelated; moreover it doesn't cover 100% of the described species (about 70% for bacteria, 40% for fungi)

State of the art in EC ?

Previous projects between European collections :

- MINE
- CABRI
- EBRCN

Producing electronic catalogs to increase visibility of these resources and providing guidelines (some protocols for conservation)

EMbaRC, a project to make accessible, authenticated, and «complete», most of the European microbial resources, **to reinforce European research and stimulate innovations**

EC Collections intrinsic quality & expertise

transnational connections, overall organisation

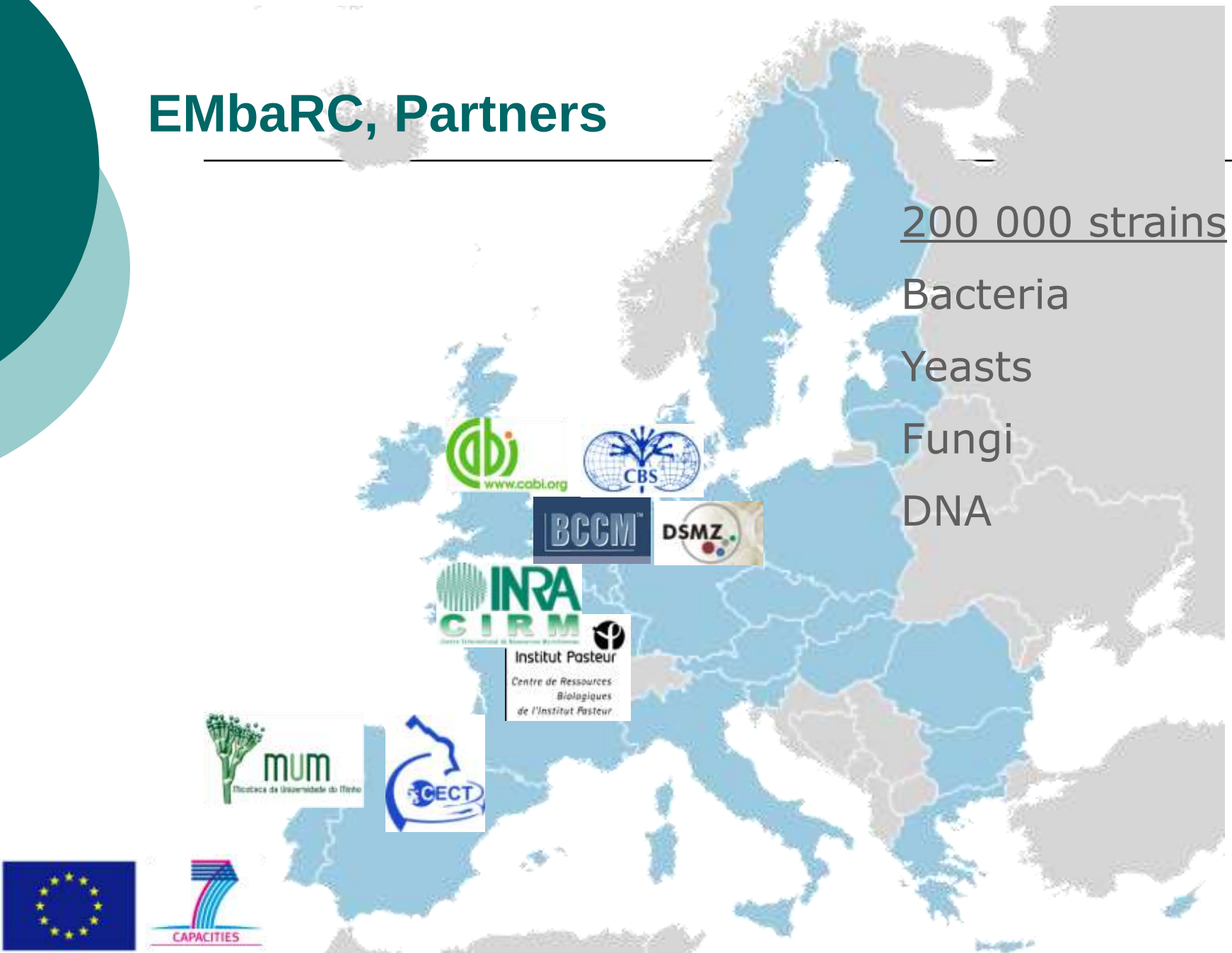
connection with Bioeconomy

EMbaRC, Partners & Project objectives

- Consortium of 10 partners
- From 7 EU countries
- EU-funded Infrastructure project
- 3 years: 2009-2012
- EU contribution: 4,2 M€

www.embarc.eu

EMbaRC, Partners



200 000 strains

Bacteria

Yeasts

Fungi

DNA

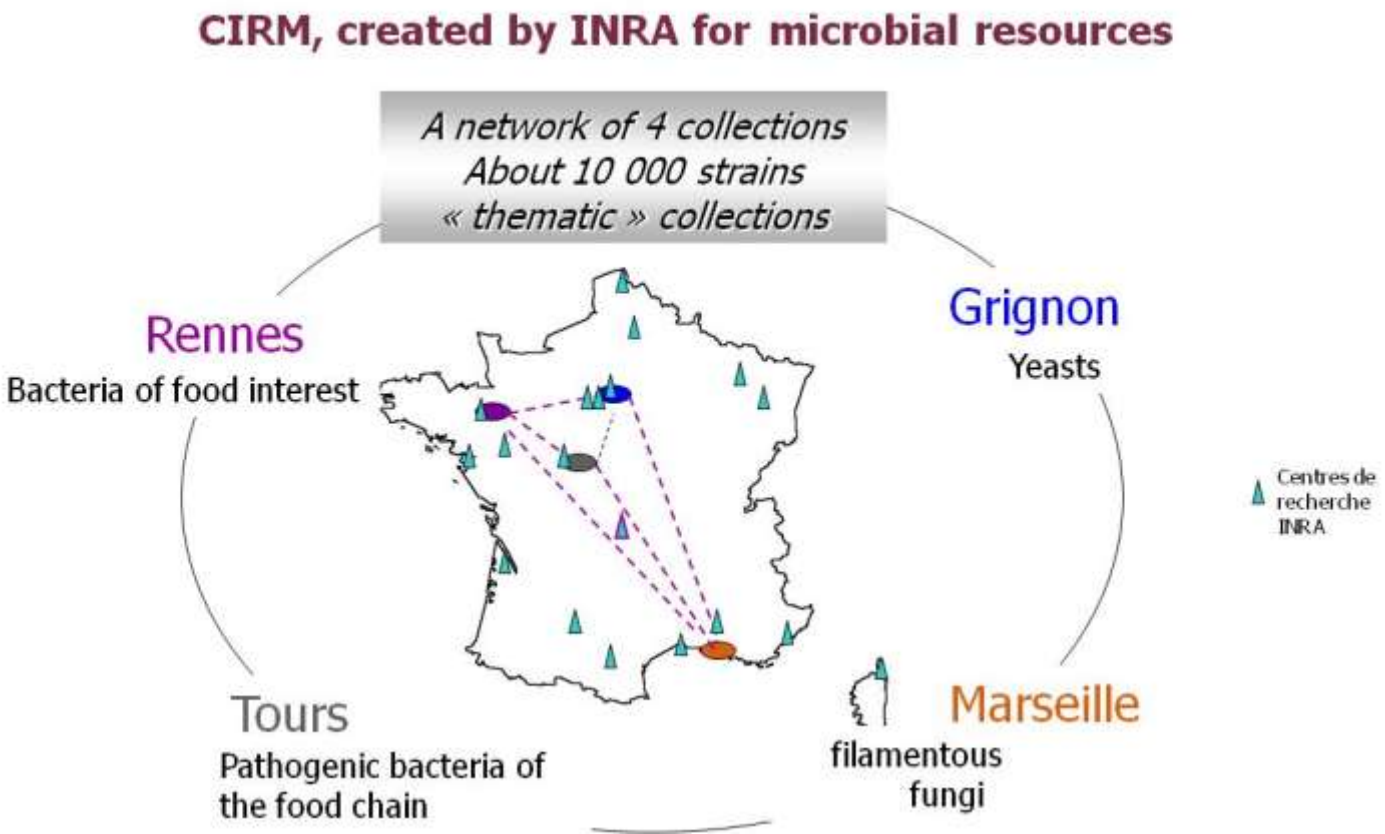
CAPACITIES

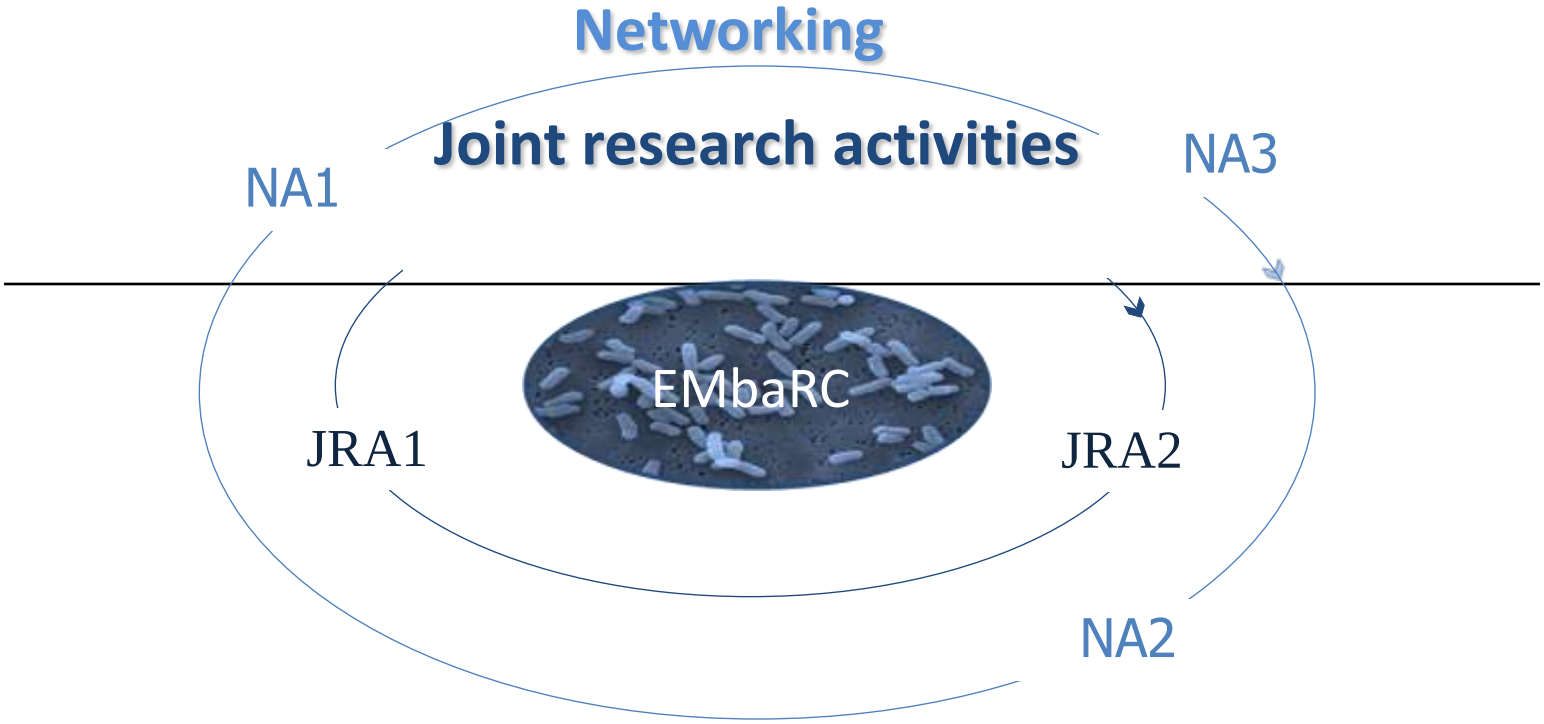
Specificity of some partners

- BCCM : not a collection but a consortium representative of four belgian collections

- INRA :

four sites





Contribution to standards

Biological material
Data & associated expertise

Call for transnational access
to the different sites

DISSEMINATION | OUTREACH | WEB PORTAL

Infrastructure users

Laboratories - Institutions - Private companies - Other collections

Few words about the coordination

Chantal Bizet, vice coordinator

Well known head of the CIP of Pasteur
Reference for collection management

Yohan Lecuona, project manager

Agronomic ingenior, trained in Bruxells and at INRA transfer for EC project management

Executive committee

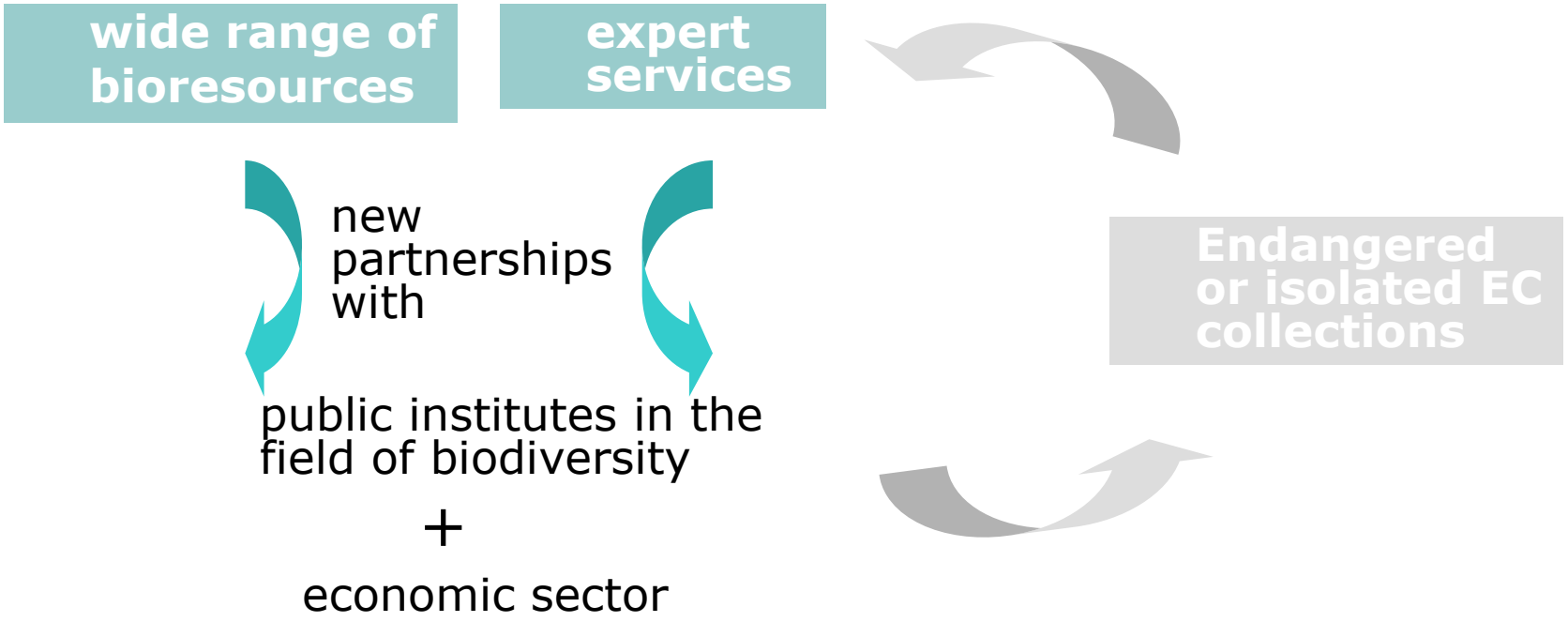
Sylvie Lortal, coordinator

Research director at INRA, head of the lab « Dairy and Egg Science and Technology », located in Rennes

Collection of Food related bacteria

EMbaRC, Project objectives

Establish a community of EC microbial resources centers – develop sustainability



Foundations of the future GBRCN

Global Resources Biological Center Network

EMbaRC, concrete expected achievements from networking activities

- **Harmonizing methods** for strain identification and validation of type/reference strains

- **Contribution to standards** : ensure consistent quality of all european collection resources, make national standards emerging to the international level (from OECD best practices to ISO specific for BRC)

- **Propose a Code of Conduct for Biosecurity** : help BRC to avoid any direct or indirect contributions to biological weapons

- **One-stop-shop to the EU collections via a web portal for users**

EMbaRC, concrete expected achievements from networking activities

- **Disseminate largely the call for access,** be a locomotive

- **Broaden the coverage ratio nb of species kept in BRC / nb species described /** strategy increase deposit, holding

- **Integrate orphans or endangered or emerging collections into the EMbaRC community, share project results via**
  - Best practices workshops
  - Targeted training programs
  - Outreach activities

- **New ways for Self-sustainability of EU BRCs,** business model

EMbaRC, concrete expected achievements from joint research activities

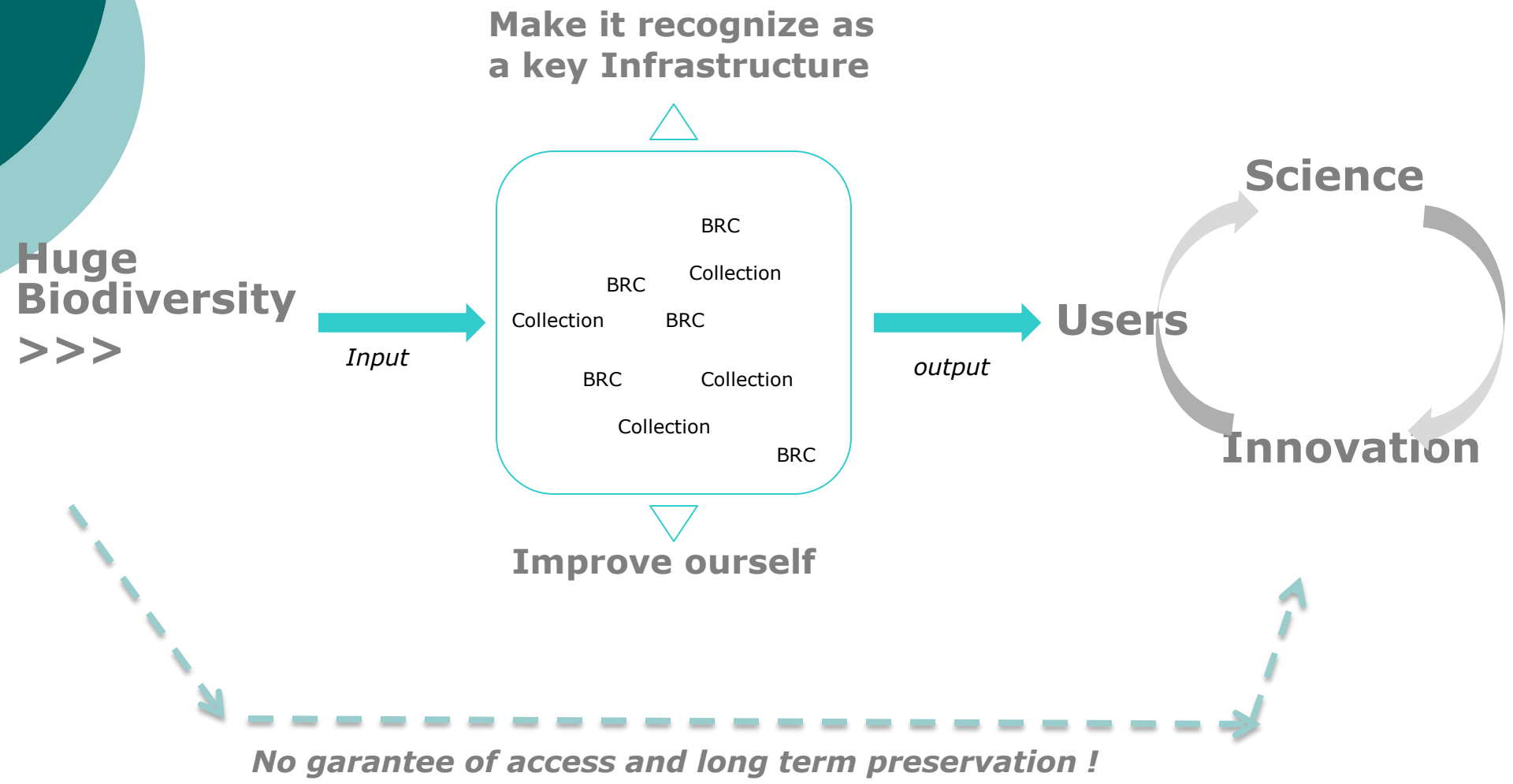
Strain & DNA preservation: longer shelf-life

European microbial DNA bank network

Exploring new methods for accurate species identification

Dissemination of the results,
via Publications

To summarize … ;-)



Many thanks for your attention

New giant Microbes « teddy bears »…