

# Coupling material and data: BioBanks

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## **ABSTRACT:**

In science as well as in business, progress results from the sharing of information generated by processing electronic data of constant quality. Access to research data is thus of primary importance.

Data may be stored either on-premise (in data centre) or off-premise (in cloud), for in-house or public use, under controlled or open access, distributed or not within local or extended networks. Data can be of taxonomic, morphological, biochemical, genomic or proteomic nature, raw or processed, for free or paying, of unlimited or restricted use, innocuous or harmful for public wealth and security.

In other words, data management is subject to technical, scientific, IT, legal and ethical constraints which must be handled all together to secure sustainable socio-economic exploitation of the resulting information.

A particular aspect of life sciences adds to these challenges: the necessary link between the studied biological material and the data derived from it. This material has added scientific value and must be preserved and documented with the necessary level of quality to ensure consistent and cumulative research.

Therefore it's a matter of good scientific practice to deposit the studied biological material into specialised infrastructures which mission is to preserve and supply well characterised biological material. These infrastructures also called BioBanks act as data and material hubs where material and related data can be retrieved simultaneously.

Mastering the technical, scientific, legal and economic challenges of data management as well as those of long term *ex situ* preservation and supply of biological material is the strategic objective of the BioBanks. Whether they keep plant or animal germplasm, material of human origin or microorganisms the BioBanks operate at the crossroad between biological material and data.

BioBanks are conceived as sources of all essentials for Research and Development in Life Sciences. They provide for technically and legally fit-for-use biological resources, related data of consistent quality and technical and scientific expertise. They are infrastructures underpinning cumulative research in Knowledge Base Bio-Economy.

In particular Microbial BioBanks also called Culture Collections are established all around the world and many of them are registered in the World Data Centre for Micro-organisms (WDCM) of the World Federation for Culture Collections (WFCC, see [www.wfcc.info](http://www.wfcc.info)).

Microbial BioBanks are appropriately dubbed "living libraries". They contribute to cumulative research in many ways. First, they preserve and distribute micro-organisms as living substratum for research, enabling multiple, complementary and reproducible research on characterized material that can be retrieved at any time. Secondly, they build extensive and updated databases directly accessible to scientists. They also develop powerful bioinformatics tools capable of automatized processing. Thirdly, microbial BioBanks are also source of expertise in different fields, including taxonomy. Finally they also provide for advices to support research policy and decision-making.

But again BioBanks can only fulfil their mission if all scientists, through good scientific practice, systematically deposit selected samples of biological material mentioned in publications.

**KEYWORDS:** Data, Biological Material, BioBanks, Culture Collections, Cumulative Research