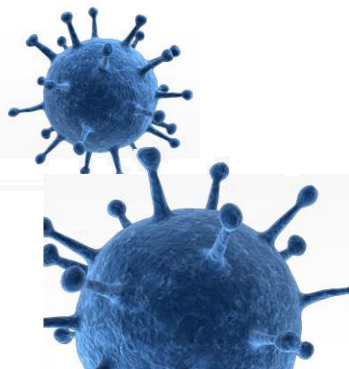


DESIGNING THE MICROBIAL RESEARCH COMMONS

PROCEEDINGS OF AN INTERNATIONAL WORKSHOP (2011)



The opportunities to accelerate scientific discovery and resulting applications are made increasingly possible by technological breakthroughs and pioneering methods to process and integrate vast amounts of data, information, and raw materials. Microbial research, which is outgrowing its “small science” institutional structures, should consider building upon these opportunities in an attempt to develop a global microbial research commons to promote access to databases, literature, and materials through an open, digitally distributed network. However, the increasingly blurred line between basic and applied research confers potential economic value even upon research inputs that are far upstream. As a result, the research community is increasingly being forced to come to terms with commoditizing pressures within developed economies. These pressures restrict the conduct of public-sector research through strong intellectual property rights and related contractual restrictions on access to and use of materials, publications, and data. At the same time, restrictive policies in developing countries under the Convention on Biological Diversity complicate research uses of microbial materials held in public repositories *ex-situ*, and make it increasingly difficult to access the vast *in-situ* materials these countries control.

These trends have led to a proliferation of diverse licensing strategies and techniques, which collectively have elevated the transaction costs and other barriers for even relatively simple cooperative research projects. There is, thus, a need to focus on the obstacles to upstream, non-commercial research and the solutions to them. An early step is development of a set of design principles that address the economic, legal, and institutional dimensions of the transformation of the existing research infrastructure into what could become a globally distributed and digitally integrated research commons. The goal of this redesigned “soft” infrastructure would be to better manage publicly funded research resources, without compromising downstream commercial applications and fruitful partnerships between the public and private sectors, or between developed and developing countries.

A variety of responses is possible. Some are more conservative with respect to an understanding of the scientific “commons” as a common resource available on a nondiscriminatory and non-commercial basis, whereas others may be based upon a pro-actively managed or regulated set of practices. These latter responses would compromise the conservative view in the interest of achieving greater patronage and participation of actors who have other motives and rationales for participation.

The Board on Research Data and Information held an International Symposium on Designing the Microbial Research Commons in Washington, DC on 8-9 October 2009. The symposium addressed topics such as models to lower the transaction costs and support access to and use of microbiological materials and digital resources from the perspective of publicly funded research, public-private interactions, and developing country concerns. The overall goal was to stimulate more research and implementation of improved legal and institutional models for publicly funded research in microbiology. Symposium participants focused on the following tasks:

1. Delineate the research and applications opportunities from improved integration of microbial data, information, and materials and from enhanced collaboration within the global microbial community.
2. Identify the global challenges and barriers—the scientific, technical, institutional, legal, economic, and socio-cultural—that hinder the integration of microbial resources and the collaborative practice of scientific communities in the microbial commons.
3. Characterize the alternative legal and policy approaches developed and implemented by other research communities, such as common-use licensing for scientific data and information, standard-form material transfer agreements, open access publishing, and open data networks that could be applied successfully by the microbial research community.
4. Define the contributions of new information and communication technology (ICT) tools in building federated information infrastructures, such as ontologies, data and text mining, and web 2.0.
5. Discuss and evaluate the institutional design and governance principles of data and information sharing among information infrastructures, drawing upon and analyzing successful and failed case studies in the life sciences.
6. Identify the range of policy issues that need to be addressed for maximizing open access to materials, data and literature information in an integrated microbial research commons.

NRC Steering Committee for Designing the Microbial Research Commons: An International Symposium: **Cathy Wu**, Chair, University of Delaware; **Michael Carroll**, American University; **Micah Krichevsky**, Bionomics International; **Michael Lesk**, Rutgers University; **Stephen J. McCormack**, IMI Devices, Bonn, Germany; **James Staley**, University of Washington; **Larry Smarr**, University of California San Diego; **Paul F. Uhler**, Director, Board on Research Data and Information

For More Information

Copies of *Designing the Microbial Research Commons: An International Symposium* are available from the National Academies Press; (800) 624-6242 or (202) 334-3313 (in the Washington metropolitan area), or visit the NAP website at www.nap.edu. For more information on the project, contact staff at (202) 334-1531 or visit the Policy and Global Affairs website at www.nationalacademies.org/pga.