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Academic scientists should collaborate more frequently with pharmaceutical and biotechnology companies to speed discoveries and to reduce overall costs when engaged in large-scale biomedical research projects, concludes a new report from the National Academy of Sciences (NAS). Universities should also revise their policies on tenure and promotion to reward researchers and managers involved in large-scale collaborative projects. This is would help to "avoid relegating these valuable scientists and managers to a 'second-tier' status," states the report, Large-Scale Biomedical Science: Exploring Strategies for Future Research.

Issued June 19 by the NAS Institute of Medicine and National Cancer Policy Board, the report contains recommendations almost certain to spark debate in the biomedical community.

"We will not be able to keep up unless we integrate the research enterprises of industry and academia," said Bruce Stillman, director of the Cold Spring Harbor Laboratory and vice chair of the committee that prepared the report. "There will be a learning curve on both sides. But if academics say they don't want to dirty their hands with industry, that's very retrograde thinking," he told us.

Over the past several years, biomedical research has been evolving from small projects initiated by individual researchers to larger-scale efforts involving multiple institutions and disciplines. The Human Genome Project is perhaps the largest and best known "big science" effort to date. Several other large projects, such as the Protein Structure Initiative, the International HapMap Project, and the Single Nucleotide Polymorphism Consortium, are underway, and many others are being contemplated. But guidance on how to organize and fund these new large research initiatives has been lacking.

"A large-scale approach is relatively new in the life sciences, so there are very few precedents to follow or learn from when planning and launching a new project of this magnitude," Stillman said.

Distinctions between basic and applied research have become blurred by novel approaches to drug discovery and development as well as by the recent focus by academic scientists on translational research, the report states. To capitalize on this, academic scientists should cooperate with industry, nonprofit institutes, and philanthropies "whenever feasible" to share the costs, risks, and benefits of research.

"Such cooperative efforts could entail collaborative projects as well as direct funding of academic research by industry, if the goals of the research are mutually beneficial," the report states. Establishing "a more seamless connection" between academia and industry "could greatly facilitate translational research and thus speed clinical applications of new discoveries."

Stillman predicts industry-academic collaborations will become essential for universities and research institutes. The current economic downturn, he says, coupled with the end of the budget doubling process at the National Institutes of Health (NIH), means there will not be sufficient funds "if the US and others fully want to exploit the truly exciting products emerging from research."

Howard Garrison, public affairs director at the Federation of American Societies for Experimental Biology, said that no consensus presently exists among member organizations over what constitutes

appropriate industry involvement in research. "The area is of great interest," he told us. "We have just begun to think about the implications of large-scale projects on the way research is done and the impact it will have on careers."

Universities will need to value more highly their scientists and managers working in large-scale collaborations, the report states. "Academic institutions should develop appropriate career paths, including suitable criteria for performance evaluation and promotion" for those involved in managing and staffing these projects. Issues of concern include equitable pay and benefits, job stability, and potential for advancement.

The NAS committee originally focused on cancer research, but it quickly became clear that their recommendations would apply to other NIH institutes as well as other government agencies, Stillman said.

The report urges the NIH, the National Science Foundation, and other federal granting agencies to develop "a more open and systematic method" of assessing research opportunities from large-scale efforts. In particular, NIH should establish a trans-institute expert panel to develop this mechanism and recommend appropriate guidelines for peer review.

Janet Shoemaker, director of public and scientific affairs at the American Society for Microbiology (ASM), has observed an increase in collaborations among industry, academia, and government in the area of civilian biodefense. She declined to comment on the NAS report because ASM officials had not yet finished reading it. But in general, she said, collaborations often trigger the need to address intellectual property (IP) rights and other ownership issues.

Noting the complexity of IP issues, the report recommends that NIH evaluate how it can promote the broad accessibility of research while considering the IP rights in any given project. The report also calls on NIH to have industry preserve reagents and other research tools. Additional NIH funding should be provided to distribute these to the scientific community following a project's completion.

More and more large-scale research projects will be proposed as time goes on, Stillman says. "How do you decide what to fund? There has to be some prioritization, and right now there is no mechanism to do it," he said.

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