

Recommendations to spur interdisciplinary research

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Advances in science and engineering increasingly require the collaboration of scholars from various fields. This shift is driven by the urgent need to address complex problems that cut across traditional disciplines, and the capacity of new technologies to both transform existing disciplines and generate new ones. At the same time, however, interdisciplinary research is impeded at many institutions by policies on hiring, promotion, tenure, and resource allocation that favor traditional disciplines, says a new report from the National Academies.

"This report identifies steps that individuals and institutions can take to more effectively conduct, facilitate, and evaluate interdisciplinary research programs and projects," said Nancy Andreasen, co-chair of the committee that wrote the report, Andrew H. Woods Chair of Psychiatry, University of Iowa, Iowa City, and director, The MIND Institute, Albuquerque, N.M.

The committee urged academic institutions to explore new models that foster and reward interdisciplinary interactions. Industrial and national laboratories have traditionally operated successful interdisciplinary programs because their research goals are established and pursued in terms of projects rather than by discipline. Teams of researchers from various fields are formed to solve particular problems, an approach that stimulates interdisciplinary interactions.

Academic institutions also should revise recruitment and hiring practices to reach across departments, placing greater emphasis on people with valuable interdisciplinary backgrounds; promotion criteria should include methods to evaluate interdisciplinary faculty and programs as well. The committee concluded that the process by which institutions evaluate interdisciplinary research programs is often imperfect. The peer-review process for both people and programs should include researchers with interdisciplinary expertise, in addition to experts in single disciplines. Also, greater flexibility in resource allocation is often needed to serve the needs of these programs.

The report's recommendations are not targeted solely to academic institutions. "Our objective is to stimulate interdisciplinary research, so we offer suggestions for everyone who plays a key role

in the research process, including students, postdoctoral scholars, researchers, educators, funding organizations, professional societies, and journal editors," said committee co-chair Theodore Brown, founding director emeritus, Beckman Institute for Advanced Science and Technology, University of Illinois, Urbana-Champaign.

Funding organizations can enhance their evaluations of interdisciplinary research programs and projects, the report adds. In particular, the review process should include scientists and engineers with interdisciplinary expertise, along with experts in discrete disciplines.

Journal editors, the committee said, should actively encourage the publication of interdisciplinary research results through various mechanisms -- for example, by including researchers with interdisciplinary experience on editorial boards, and by establishing special interdisciplinary issues or sections.

Professional societies could serve as incubators for generating and facilitating interdisciplinary programs and projects. These organizations could produce intersociety reports on cutting-edge research developments, offer opportunities for researchers from different fields to interact, publish interdisciplinary journals, and recognize excellence in interdisciplinary research, the committee said.

The report calls on undergraduate and graduate students and postdoctoral scholars to actively seek out interdisciplinary experiences, and to pursue training and study in one or more fields in addition to their own. Junior researchers also should take advantage of networking opportunities and identify mentors favorable to interdisciplinary research. Faculty members who hire postdoctoral researchers from other fields should assume responsibility for educating them in the new specialty and also take the initiative to learn about the postdocs' expertise.

The study was sponsored by the National Academies Keck FUTURES INITIATIVE, which was launched in 2003 to stimulate new modes of scientific inquiry and break down the conceptual and institutional barriers to interdisciplinary research. Additional information on the study may be found at <http://national-academies.org/interdisciplinary>. A committee roster follows.

The National Academies comprise the National Academy of Sciences, National Academy of Engineering, the Institute of Medicine, and the National Research Council. They are private, nonprofit institutions that provide science, technology, and health policy advice under a congressional charter.

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