



NIH BACKGROUNDER

National Institutes of Health

Research Teams of the Future

The scale and complexity of today's biomedical research problems demand that scientists move beyond the confines of their individual disciplines and explore new organizational models for team science. Advances in molecular imaging, for example, require collaborations among diverse groups—radiologists, cell biologists, physicists, and computer programmers. NIH wants to stimulate new ways of combining skills and disciplines in the physical, biological, and social sciences to realize the great promise of 21st century medical research.

As part of the Research Teams of the Future theme, the NIH Roadmap seeks to encourage scientists to test a variety of models for conducting research. The three initiatives in the area are: High Risk Research, Interdisciplinary Research, and Public Private Partnerships. Several grants were awarded in fiscal year (FY) 2004 to begin the process of transforming the way scientists do their work and how their work is reviewed and supported.

High-Risk Research

Leaps in knowledge often result from exceptional minds exploring ideas that were considered risky at their inception, especially in the absence of strong supportive data. The changing face of biomedical research calls for support of aggressive risk-taking and innovation that will produce tomorrow's conceptual and technological breakthroughs. Much of the NIH's success derives from its reliance on investigator-initiated research proposals (R01 awards) and its dual system of peer review and advisory council oversight. Additional avenues seem necessary, however, to encourage high risk/high impact research to challenge the status quo across the breadth of the NIH mission. As a first step in that direction, the NIH has established the NIH Director's Pioneer Award to support exceptionally creative individual scientists.

The NIH Director's Pioneer Award Program

This unique program will support individual scientists who have pioneering ideas and approaches to major contemporary challenges in biomedical research. Following announcement of the program in January 2003, NIH reviewed approximately 1000 nominations. After a multi-phase review by external evaluators, the first nine award recipients were selected to receive \$500,000 in direct costs per year for five years. This award will give the recipients the time and resources to develop and test far-ranging ideas and make truly groundbreaking discoveries. This award is a pilot and will be offered again each year through 2008.

Interdisciplinary Research

The study of human biology and behavior is a fascinating and dynamic process. More than ever, it requires the bridging of traditional divisions between scientific disciplines to speed the pace of scientific discovery. Although research teams have included individuals from multiple disciplines, integrating different disciplines holds the promise of opening up currently unimagined scientific avenues of inquiry and, in the process, may form new disciplines with which to tackle increasingly complex questions. Planning for interdisciplinary research requires changes in all aspects of science conduct and support, including the training of investigators and development of new research methodologies.

The initial fiscal year 2004 awards fund planning grants for interdisciplinary research centers, innovative training programs, and the development of methodologies aimed at integrating behavioral and social science into interdisciplinary research.

Exploratory Centers (P20) for Interdisciplinary Research

Using the P20 (exploratory center) mechanism, planning centers funded in FY2004 will combine various aspects of individual disciplines to provide new ways of thinking about and addressing key and complex problems in the biomedical sciences. These efforts are likely to yield insights that could not have been achieved by an isolated laboratory or using a multi-disciplinary approach. Initial funding is being provided for three years to support planning activities for the interdisciplinary centers. This is intended to lay the foundation and prepare investigators to submit a subsequent application for substantial, long-term support through an Interdisciplinary Research Consortium.

Interdisciplinary Health Research Training: Behavior, Environment, and Biology

Many of the Nation's most pressing health problems involve disease processes that are influenced by biological, behavioral, social, and environmental factors. This initiative aims to develop a cadre of scientists who can integrate diverse scientific approaches and work in interdisciplinary teams to solve complex health problems. Programs will be established to provide formal coursework and research training in a new interdisciplinary field to individuals holding advanced degrees in a different discipline. The overall goal will be to ensure that highly trained scientists will be available in adequate numbers and in appropriate scientific areas to carry out the Nation's biomedical and behavioral health research agenda.

Training for a New Interdisciplinary Research Workforce

This initiative fosters the development of an interdisciplinary workforce through novel training programs at the undergraduate through postdoctoral levels. These programs will provide a variety of innovative learning and research activities to give students the necessary knowledge and experience to apply interdisciplinary solutions to complex biomedical and health problems. The ultimate goal is to develop a cadre of interdisciplinary research scientists who will be well equipped to address increasingly complex challenges in health and biomedical research and who will participate in, and perhaps lead, research teams of the future.

Curriculum Development Award in Interdisciplinary Research

Innovative educational approaches are needed to train interdisciplinary scientists in the biomedical, behavioral, and quantitative sciences. This initiative supports the development of programs designed to prepare students from the undergraduate to the postdoctoral level to

conduct research in collaborative interdisciplinary settings and to be future leaders in catalyzing the integration of multiple disciplines. Through these educational approaches, particular aspects of different disciplines will be combined to develop entirely new ways to approach biomedical and behavioral research problems.

Short Programs for Interdisciplinary Research Training

Through the development of short, interdisciplinary training programs for scientists at all career levels, students trained in one discipline will gain a fundamental knowledge of one or more other disciplines. These programs will include Short Laboratory Courses and Short-Term Research Institutes. This initiative, funded in FY2004 and reissued for FY2005, is designed to promote training in multiple disciplines to encourage creative problem-solving and the fusion of disciplines into novel "interdisciplines."

Supplements for Methodological Innovations in the Behavioral and Social Sciences

This initiative provides supplements to already-funded NIH research projects to develop innovative methodology in four general areas of social and behavioral sciences research: research design, data collection, measurement, and data analysis. The resultant new methodologies will allow investigation of the full impact of behavioral and social factors on health and facilitate the performance of interdisciplinary research at the intersection of the behavioral, social, and biomedical sciences.

Meetings and Networks for Methodological Development in Interdisciplinary Research

The behavioral and social sciences have broad significance and are fundamental to the comprehensive understanding of disease etiology and treatment as well as to the promotion of health and well being. This initiative will support, over 1-2 years, a number of scientific meetings or networks to explore and develop methodologies in the behavioral or social sciences, with the ultimate goal of better integrating these disciplines into interdisciplinary health research. Of particular interest will be areas of research in human health and well-being that can be significantly advanced through an interdisciplinary approach.

Public-Private Partnerships

As researchers tackle ever more complex biomedical problems, strategic partnerships between NIH, private industry, and nonprofit organizations have become critical to advancing science and communicating research results to improve the quality of life for all people. NIH has mechanisms in place to encourage partnerships, yet few NIH-supported researchers and potential partners are aware of the opportunities available. The Public-Private Partnerships component of the NIH Roadmap will begin with a focus on agency processes and mechanisms to facilitate collaboration between the NIH and the private sector.

The NIH Roadmap for Medical Research is a series of far-reaching initiatives designed to transform the Nation's medical research capabilities and speed the movement of scientific discoveries from the bench to the bedside. It provides a framework of the priorities the NIH must address in order to optimize its entire research portfolio and lays out a vision for a more efficient and productive system of medical research. Additional information about the NIH Roadmap can be found at <http://nihroadmap.nih.gov>.

The National Institutes of Health (NIH), an agency of the U.S. Department of Health and Human Services, is the primary Federal agency for conducting and supporting basic, clinical, and translational medical research. NIH is comprised of 27 institutes and centers and investigates the causes, treatments, and cures for both common and rare diseases. For more information on the NIH, please visit the NIH Web site at <http://www.nih.gov>.

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