THE NATIONAL ACADEMIES

DIVISION OF BEHAVIORAL AND SOCIAL SCIENCES AND EDUCATION

Goals of the NRC Study

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Advisers to the Nation on Science, Engineering, and Medicine

National Academy of Sciences
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Study Origins

- Conversations with NIH and NSF staff
- Both agencies have invested heavily in team science, but collaborations are not always successful
- Both agencies have extensive criteria for reviewing the scientific/technical merit of research proposals, but lack criteria for reviewing readiness for successful collaboration

Need for the Study

- There is a large body of relevant research to be synthesized and translated to improve practice and research
- Research on groups and teams; management science; organizational development, etc.
- Team research often focuses on small groups within a single organization (e.g., an ER), but incentives, organizational structures, roles and expectations in academia are quite different from those in other types of organizations

Need

- Recently, more research focuses specifically on science teams
- Relevant research comes from different disciplines, published in various journals
- To promote dialogue, NCI funded 3 international conferences on the Science of Team Science (SciTS); the fourth is planned for June, 2013

Need

- Team science takes a variety of forms and structures (as noted earlier today)
- There is no one definition of team science
- Many factors at the individual, team, organizational, and funding agency level influence success
- Agencies, scientists, academic leaders, need to know what factors are most critical

Study Charge

- **Statement of Task**: An *ad hoc* committee will conduct a consensus study on the science of team science to recommend opportunities to enhance the effectiveness of collaborative research in science teams, research centers, and institutes. The Science of Team Science is a new interdisciplinary field that empirically examines the processes by which large and small scientific teams, research centers, and institutes organize, communicate, and conduct research. It is concerned with understanding and managing circumstances that facilitate or hinder the effectiveness of collaborative research, including translational research. This includes understanding how teams connect and collaborate to achieve scientific breakthroughs that would not be attainable by either individual or simply additive efforts.

Study Charge (cont)

The committee will consider factors such as team dynamics, team management, and institutional structures and policies that affect large and small science teams. Among the questions the committee will explore are:

- How do individual factors (e.g., openness to divergent ideas), influence team dynamics (e.g., cohesion), and how, in turn, do both individual factors and team dynamics influence the effectiveness and productivity of science teams?
- What factors at the team, center, or institute level (e.g., team size, team membership, geographic dispersion) influence the effectiveness of science teams?
- How do different management approaches and leadership styles influence the effectiveness of science teams? For example, different approaches to establishing work roles and routines and to the division of labor may influence team effectiveness.
- How do current tenure and promotion policies acknowledge and provide incentives to academic researchers who engage in team science?
- What factors influence the productivity and effectiveness of research organizations that conduct and support team and collaborative science, such as research centers and institutes? How do such organizational factors as human resource policies and practices and cyberinfrastructure affect team and collaborative science?
- What types of organizational structures, policies, practices and resources are needed to promote effective team science, in academic institutions, research centers, industry, and other settings?

Study Charge (cont).

- The committee will issue a final report with conclusions and recommendations to advance team science practice and research. The report will inform science teams, funders and managers of team science. The report will be reviewed consistent with the National Academies procedures and released to the sponsor when the review is complete.

Study Users

- Scientists who focus on the research questions and lack time to review and interpret the research on collaboration
- Funding agencies, that can develop grant requirements and review criteria for collaboration/teamwork
- Funding agencies, that can identify--and possibly provide--critical supports (e.g., cyberinfrastructure , teamwork training)

Study Users

- Industry associations, who can inform their members about the critical factors for successful interdisciplinary research
- University administrators, who can work to provide a supportive context for effective team science (e.g., through changes in criteria for tenure and promotion)

Study Users

- Research centers that can provide the support and infrastructure needed for collaboration
- Team science researchers, who will be able to target studies to areas where research is most needed

Study Users

- The public who will benefit from the scientific, technological, and human health advances resulting from more successful collaborations
- Taxpayers who will benefit from more effective use of limited federal research funding

Questions?