Analysis IN BRIEF

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The Functions of Centers and Institutes in Academic Biomedical Research

Many observers of the academic biomedical research enterprise believe the life sciences are becoming inherently interdisciplinary. In this milieu, investigators do not function solely within traditional disciplines, but rather collaborate with experts from mathematics, computer science, engineering, chemistry, physics, psychology, anthropology, and other areas. Promising avenues of basic research and clinical application require links among and beyond disciplines and across institutions. Organized research units—that is, centers and institutes[1]—are a common mechanism for facilitating scientific work in universities and medical schools, but little is known about the functions that research centers and institutes perform. On what activities do research centers and institutes focus? Are these units really interdisciplinary in nature?

In this *Analysis in Brief,* we report on the findings from a 2004 survey of directors of research centers and institutes located at research-intensive medical schools and their parent universities, who identified their unit's primary mission as basic, clinical, or other type of research.[2] While many assertions have been made about the functions that centers and institutes perform, or do not perform, our findings indicate that their missions and roles are varied, complex, and nuanced. The 604 research centers and institutes in the study conduct a variety of tasks (Table 1). For the purposes of this analysis, we define "some effort" to be at least 10 percent but less than 50 percent of the center's effort; "a majority of effort" is 50 percent or more. Not surprisingly, most research centers devote a substantial portion of their effort to basic or clinical research or both.

These research-oriented centers and institutes are involved in a number of other activities as well, including education (61 percent provide at least some effort), patient care (20 percent devote some or a majority of effort), service and outreach (28 percent of centers commit at least some effort), and patenting or technology transfer (just under 10 percent provide at least some effort). These various roles and functions—conducting basic and clinical research; providing service to individuals and the community; and participating in the education of graduate students, medical students, residents, fellows, and others—indicate that research centers and institutes can facilitate and may even enhance the research, service, and teaching opportunities of faculty as well as foster educational opportunities for students, thus contributing to the overall richness and variety of the many missions of the medical school.

Table 1: Percentage of Effort Devoted to Various Activities by Research Centers (n = 604)

Activity	Percent Effort			
	None	Little <10%	Some >10%, <50%	Majority 50%+
Basic research	14.2	8.8	23.3	53.4
Clinical research	15.1	17.1	44.3	23.5
Education	7.8	30.4	58.4	3.3
Patient care	64.1	15.8	17.5	2.7
Service/Outreach	27.8	43.8	27.1	1.3
Patenting/Tech transfer	46.1	44.4	9.2	0.3

[1] This report uses the terms "center" and "institute" interchangeably.

[2] A total of 1,450 centers were included in the sample population; 761 completed the survey (52.5% response rate). Of this, we report here on the 604 centers that focused primarily on research. Further details of the sample and other methodological issues can be found in the full report, referenced below.

Research centers and institutes are typically cited as mechanisms for coordinating research among scientists from a variety of fields. Calls for a greater emphasis on interdisciplinary scientific collaboration abound in the United States and throughout the world. For example, the NIH's recent Roadmap for Medical Research promotes the idea that medical schools and universities need to develop collaborative teams in addition to fostering the work of individual scientists. But do research centers really operate in interdisciplinary ways?

Previous research concluded that they do not. A generation ago, Friedman and Friedman (1982)[3] found that less than one-third of centers in the biological sciences and only half the centers in the medical sciences interacted with more than one department; interactions with more than three departments were uncommon. By comparison, centers in the 2004 AAMC survey involved faculty from a greater number of departments (mean = 4.89, median = 4). In 2004, only 15 percent of centers included faculty from a single department; 70 percent of centers included faculty representing three of more departments (Table 2).

Both Friedman and Friedman (1982) and the AAMC study defined an interdisciplinary approach to research as faculty from different disciplines working together on the same project and a multidisciplinary approach as faculty from different disciplines working independently on different aspects of a project. In the Friedmans' 1982 study, only 23 percent of medical science centers and 24 percent of biological science centers stated that their approach to work could be characterized as interdisciplinary.

The AAMC survey found that modern centers and institutes in the biomedical and health-related research fields embrace more interdisciplinary approaches to their work than similar types of centers in the 1980s. Forty-two percent of the research centers and institutes in the 2004 study indicated that their approach to research was interdisciplinary, with an additional 39 percent indicating multidisciplinary, 7 percent unidisciplinary, and 12 percent some combination of the categories. These results show a substantial increase in the percentage of centers and institutes that have an interdisciplinary approach to their work.

Newer basic research centers in the AAMC sample (those established in 1993 or after) were more likely to be multidisciplinary and less likely to be unidisciplinary than older basic research centers (those established in 1992 or before). Newer clinical research centers in our study were more likely to be interdisciplinary than older clinical research centers. These findings also indicate a continued shift toward more collaborative approaches in both basic and clinical investigations.

These data suggest that centers and institutes are responding to the demands of science, and of funding agencies, for increased interaction among investigators from many fields. At a time when the NIH and other funding agencies may increasingly reward team science, centers and institutes may be attractive mechanisms for faculty to pursue collaborative activities and secure external grant support.

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This *Analysis in Brief* is drawn from *Characteristics of Research Centers and Institutes at Medical Schools and Universities* (AAMC, 2005).
To obtain a copy of the full report, see www.aamc.org/publications.

Table 2: Comparison of Interdisciplinarity and Faculty Involvement in Centers, 1982 and 2004 (in percent)

	Friedman & Friedman (1982)		AAMC (2004)
	Medical Sciences	Biological Sciences	
Approach to research:			
Interdisciplinary*	20	24	42
Multidisciplinary*	60	58	39
Unidisciplinary*	20	18	7
Some combination of categories	0	1	12
Departments represented in work:			
One department	50	69	15
3 departments or more	38	19	70

* For comparative purposes, we adopted the same definitions for inter-, multi-, and unidisciplinary as Friedman and Friedman (1982). *Interdisciplinary* is defined as faculty from different disciplines working together on the same project; *multidisciplinary* is defined as faculty from different disciplines working independently on different aspects of a project; and *unidisciplinary* is defined as faculty from a single discipline working together, using consultants from other disciplines as needed.

[3] Friedman RS, Friedman RC. *The Role of University Organized Research Units in Academic Science.* University Park: Pennsylvania State University Center for the Study of Higher Education; June 1982.

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