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Recent Trends in Basic Science Department Reorganizations

The past several decades have seen a rapid and profound expansion of knowledge within the biomedical sciences. Achievements in molecular biology, human genetics, and neuroscience, among others, have contributed to the realization that the complexity of science now lends itself to interdisciplinary and collaborative efforts. This transformation of biomedical science has led to questions regarding the organization of academic departments in U.S. medical schools around traditional basic science disciplines. Some have proposed that the discipline-based department impedes scientific progress and a new structure that breaks down boundaries is needed. Others believe that traditional basic science departments continue to foster valuable and distinct contributions to research and education.

To examine the ways in which basic science departments have evolved in this larger pattern of change in biomedical science, previous research analyzed the restructuring of medical school basic science departments from 1980 to 1999.^{1,2} This *Analysis in Brief* extends those findings with five additional years of data from 2000 to 2004 and explores two specific questions on recent trends in these reorganizations. Data tracking the numbers of basic science departments and specific changes occurring within them were triangulated among the AAMC Faculty Roster, the AAMC *Directory of American Medical Education*, and individual institutional information (Web sites and personal correspondence). The data reflect departments designated as basic science by their home institution, but do not include any pathology depart-

ments because of the widespread variation in the classification of these departments as basic science or clinical.

What trends in the number of basic science departments have occurred in the past five years?

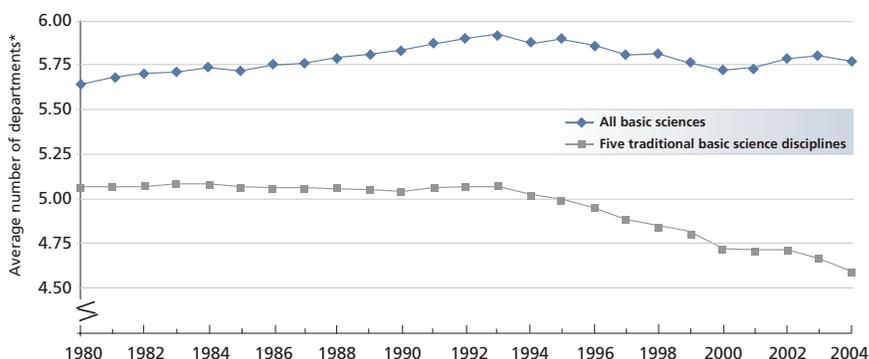
Previous research found that for the five traditional basic science disciplines (anatomy, biochemistry, microbiology, physiology, and pharmacology), the average number of departments remained steady from 1980 to 1993, but then began to decline from 1994 to 1999. The data from the past five years reveal that the downward trend continued, and the average number of traditional basic science departments has now progressively declined for the past decade (Figure 1). These data also reveal, however, that the average number of all basic science departments at U.S. medical schools, which include the five traditional areas as well as other departments falling under the "basic science" rubric, increased from

2001 to 2003. This upward trend partially negates the downward pattern seen from 1994 to 2000 and establishes that, at a national level, the numbers of all basic science departments have remained fairly steady over the past quarter century.

What types of changes have recently occurred in the organizational structure of basic science departments, and in what disciplines?

Many of the more substantive organizational changes in basic science departments occurred at a much higher frequency from 2000 to 2004 compared to the previous 20 years. While 94 new basic science departments have been added in the past 25 years, 31 (33 percent) of those additions occurred in the past five years (Table 1). Similarly, while 16 departmental closures have occurred in the past 25 years, six (38 percent) of them took place in the past five years. The frequency of these recent changes reflects at least an 11 percent increase over that in any previous five-year period.

Figure 1. Average number of basic science departments at U.S. medical schools, 1980-2004 (excluding pathology departments)



* Note: The scale on this chart has been truncated for a clearer data presentation.

The specific types of organizational changes directly influence the number of basic science departments. During the past decade, the number of basic science departments in the five traditional disciplines decreased because the large number of departmental mergers was not offset by the creation of new departments: the majority of newly created departments fell outside of the five traditional areas and commonly included neuroscience, genetics, and those with a human health, public health policy, or preventative medicine focus, frequently reflecting more interdisciplinary research. The decline in the number of all basic science departments between 1994 and 2000 was, similarly, a consequence of a large number of mergers and closures. The overall

number of departments increased from 2001 to 2003 due to a spike in numbers of newly created departments.

Rather than the loss or gain of a department, the most common type of change to basic science departments in 2000 to 2004 (accounting for 48 percent of the total number of changes during those years) is a name change to an existing department. This modification may reflect efforts to increase attractiveness or competitiveness without the substantial investment it takes to create a new department. These name changes are not equally distributed across the traditional disciplines; the majority occurred in departments of anatomy, followed by biochemistry and physiology (Table 2).

Departmental mergers were most common between departments of anatomy and physiology and between departments of biochemistry and pharmacology, each accounting for three of the 16 mergers that took place between 2000 and 2004. Other mergers occurring more than once are between departments of microbiology and immunology and between departments of pharmacology and physiology (two mergers each).

Together, these changes in recent years substantiate the idea that the organization of basic science departments in U.S. medical schools is in a continuing state of transition. Medical schools are restructuring their basic science departments by consolidating the number of traditional departments and adding new departments to reflect scientific complexity and opportunity, as well as the changing nature of biomedical research. These departmental changes are occurring in the context of other institutional alterations as well, including growth in the number of interdisciplinary research centers and institutes, and curricular shifts that encompass integrated programs spanning departmental boundaries. That said, while these data do confirm that the numbers of traditional disciplinary-based basic science departments are decreasing, they are not in fact disappearing or being consolidated into single organizational units, nor are they being replaced by centers and institutes, as some commentators have speculated.

Table 1: Type and frequency of changes to basic science departments, 1980-2004

Change Event*	Total number of change events, 1980-2004	Number of change events, 2000-2004	% of total events occurring in 2000-2004
Name change	381	55	14
New department added	94	31	33
Merger	61	16	26
Closure	16	6	38
Multiple department reorganization	7	3	43
Split	11	1	9
Reclassification	10	1	10
Departments converted to centers	1	1	100
<i>Total</i>	581	114	20

*Definitions of change events are available online at www.aamc.org/data/aib

Table 2: Change events by department type, 2000-2004

	Change Event*				
	Closure	New department	Name change	Reclassification	Split
Anatomy/cell biology	2		17		
Biochemistry			12		
Microbiology	1	3	5		1
Pharmacology			5		
Physiology			9		
Other departments	3	28	7	1	
<i>Total</i>	6	31	55	1	1

*Multiple department reorganizations and mergers not included

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¹ Mallon WT, Biebuyck JF, Jones RF. The Reorganization of Basic Science Departments in U.S. Medical Schools, 1980-1999. *Academic Medicine*. 2003;78: 302-306.

² The number of allopathic medical schools included in this study varied from 120 to 122 per year; the total number of medical schools per year varied from 123 to 125 (three schools were excluded per year).

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