

Bonus Pay for Research Faculty

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Biomedical research is enjoying remarkable growth, fueled by unprecedented levels of public and private funding. The higher-education community increasingly views biomedical research and the intellectual property it generates as keys to university prestige and prosperity, while political leaders covet biotechnology as a favored engine of regional socioeconomic development. In this bullish milieu, U.S. medical schools are vigorously investing in new facilities and hiring research faculty who are expected to generate sufficient external research funding to become substantially self-supporting. To spur faculty effort, the schools, with growing frequency, are offering annual salary bonuses of upwards of tens of thousands of dollars to basic science faculty for crossing certain thresholds of sponsored research funding or recovering targeted portions of their salaries from extramural grant support. Although many administrators and faculty members herald the outcomes of bonus pay plans as “win-win” for both researcher and institution, we believe that these new compensation policies have the potential to undermine traditional academic relationships, as well as concepts of academic values, mission, and duty.

According to the Association of American Medical Colleges’s 2002 survey of faculty personnel policies, 80 of 125 U.S. medical schools now offer some type of salary bonus or incentive policy for basic science faculty. Some forms of incentive programs are not entirely new—for example, one-time recognition awards for teaching or research excellence. However, as demonstrated in the corporate setting, recognition programs have limited impact because they tend to recognize only a handful of individuals, do not change behavior, and do not motivate people to perform at higher levels (1). Another form of incentive is for institutions to provide productive investigators supplemental funds to cover research-related expenses such as additional personnel, travel, journal subscriptions, equipment, or recruitment costs.

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Neither of these types of incentive programs, however, directly links investigators’ paychecks to performance the way salary incentive programs do. Typically available to full-time tenured and tenure-track faculty members, research incentives are based on one of three factors: (i) the percentage or amount of salary recovery the investigator generates; (ii) the amount of recovery of administrative and facility costs (also known as indirect costs) from all grants the investigator is awarded; or (iii) a combination scheme based on salary and indirect cost recovery.

The size of incentive payments can vary widely depending on how the institution structures the plan. For illustrative purposes, we devise a hypothetical faculty member, Dr. Smith, who earns an annual university salary of \$100,000. Dr. Smith recovers 75% of her salary through external funding. In this hypothetical example, the university recovers \$125,000 of its indirect costs from Dr. Smith’s research programs. We applied this hypothetical case to the extant research incentive policies at four private and six public medical schools (see table, page 477). At one end of the scale, Dr. Smith would receive an incentive payment of \$30,000, a 30% increase over her base salary; at the other, her payment would be just over \$3000, a 3% bonus. Observers may assume “up-and-coming” institutions would be more likely to offer bonus pay than schools with solid research reputations. As the table indicates, however, institutions that have implemented basic science incentive pay plans span the range of research intensity.

Faculty practice plans have long since adopted performance-related compensation plans, including salary bonuses, for medical school clinical science faculty (M.D. faculty who engage in variable combinations of teaching, research, and provision of patient care services). These rewards are expected to manage market-competitive compensation levels well above typical academic norms, to spur clinical activity, and to increase revenues and market share. Extension of the incentive pay model to basic science faculty is of recent vintage, but has similar purposes of spurring growth and increasing market share. Moreover, this trend seems to be

spreading: of the 10 medical schools in the table, for example, 8 have developed or significantly revised their research incentive policies since 2000.

Benefits of Incentive Compensation Plans

For the medical schools—and especially for private and public research-intensive schools, whose “hard money” base is typically less than 15% of total annual expenditures (2)—the plans offer welcome financial flexibility. Thus, the institution can participate in the biomedical research boom and attempt (often explicitly) to better its standing in the NIH rank list of award recipients; leverage its limited institutional funds in managing the substantial costs incurred in assembling physical infrastructure and intellectual capital; and enhance institutional prestige and attractiveness to its many publics.

As indicated in the table, salary incentive plans can offer faculty a sizeable boost in annual income, which can be an important tool in recruitment and retention. Incentive compensation can keep successful researchers from drifting to greener pastures and can lure new faculty members contemplating multiple job opportunities. In an era of unprecedented state-budget deficits, when many public institutions have had their pools for salary increases deeply slashed or eliminated entirely, incentive plans enable productive investigators to maintain or improve pay despite severe budgetary constraints. Finally, research incentive plans begin to offer basic scientists a type of performance-based compensation system comparable to those that clinical science faculty have enjoyed for many decades, thereby promising to address some of the sense of financial inequity between faculty scientists and clinicians that has long plagued schools of medicine (the differential in average compensation between basic and clinical science faculty at U.S. medical schools was over \$70,000 in 2002).

Potential Drawbacks

We argue that salary incentive plans, for all of their perceived benefits, carry potential risks that should concern academic leaders both in the medical school and across the university. First, and perhaps most problematic, is the institutional endorsement of a faculty reward system that disproportionately recognizes achievement in only one of the institution’s multiple academic missions. These incentive systems, in effect, tend to transform fac-

ultly into academic piecemeal and to devalue components of the academic mission such as mentorship, citizenship, and institutional and public service that are less tangible and more difficult to quantify. Put differently, such compensation schemes threaten to undermine faculty's fidelity to "academic duty" (3). Incentive policies based on volume of sponsored research dollars may produce basic science faculty too busy to teach and mentor. As financial and productivity data and increasingly widespread anecdotal reports suggest, this has been the fate befallen many clinical science faculty who, responsible for generating their salaries through patient care revenues in a managed care environment of steadily decreasing reimbursement per unit of clinical service, have found themselves with progressively less time for students, let alone scholarly pursuits (4-6). Furthermore, at a time when academic biomedical research is burdened with expanding regulatory requirements that demand faculty participation on review and oversight committees, faculty with bonus pay tied to research dollars may have less incentive to contribute to institutional and community service. Indeed, some medical schools have already found it necessary to pay faculty for service on institutional review boards. Institutions cannot demand academic duty if faculty compensation systems become increasingly tied to measures of productivity that do not recognize good citizenship, nor can they expect scholarship unless they provide faculty the time to be scholars.

Second, salary incentives for research faculty may alter academic values. These plans tend to be structured to reward research that attracts external sponsors who pay full indirect costs, which may distort the university's research portfolio both qualitatively and quantitatively. Faculty members may lose incentive to pursue unconventional, risky, or cutting-edge investigations that may have difficulty winning grant support from full-cost sponsors. Bonus plans may also distort university values by hampering collegiality or fostering a community of "haves" and "have-nots" within the same academic units. A faculty member at the threshold of significant salary bonus may forego collaboration, mentorship, teaching, or service to the profession in order to secure one more grant. Salaries of researchers successful at

FACULTY INCENTIVE COMPENSATION PLANS

Medical school	Control	Quintile ranking of research funding	Hypothetical incentive (\$/year)
A	Private	2	3,155
B	Public	4	5,250
C	Public	4	9,375
D	Private	1	10,000
E	Private	1	12,500
F	Private	2	12,500
G	Public	3	15,000
H	Public	3	20,455
I	Public	2	20,833
J	Public	3	30,000

Annual incentive payment at 10 medical schools for Dr. Smith, a hypothetical faculty member with a \$100,000 salary (75% covered by extramural research support) and \$125,000 in indirect cost recovery from all sponsors. Schools are not identified by name to protect their confidentiality. See (11) for more information about quintile ranking of research funding (total grants and contracts).

winning sizable extramural grant support may increase appreciably while those with larger contributions in other mission areas languish. Neither scenario can be good for faculty morale or, in the longer term, academe itself.

Finally, research incentive compensation policies could tarnish academic mission by further enhancing an already problematic image of commercialism (7) to an American public that has long held the perception of universities and their medical schools as institutions of public trust (8). The academy should be careful to avoid even the appearance of excessive inurement of investigators who derive so much of their research support from federal funds. It is noteworthy that the FY 2003 work plan of the Department of Health and Human Services Inspector General explicitly targets faculty effort and compensation reporting on NIH grants (9). In a climate of heightened regulatory scrutiny, academic medicine is deeply concerned that current NIH guidelines regarding faculty effort and compensation reporting are dated and clash with contemporary academic medical center organization and compensation arrangements (10). Notwithstanding, the guidelines clearly disallow faculty bonus plans keyed exclusively to the magnitude of NIH grant support. Institutions planning to initiate research incentive compensation mechanisms should be sure to understand the applicable regulations.

U.S. medical schools have long demonstrated a pattern of insatiable appetites fed increasingly by external funds from public sources (6). Beginning with

the enactment of Medicare and Medicaid, generous streams of clinical revenue fueled the massive expansion of the academic clinical enterprise, leading to a seven-fold increase in the number of clinical science faculty and an enterprise that became largely self-driven, self-sustaining, and increasingly unlinked from the core needs of medical education and research. The funding environment dramatically changed with the advent of managed care, and now, almost 20 years later, clinical academe, and especially clinical research and scholarship, is under enormous stress. The recent 5-year doubling of the NIH budget seems to have sparked a similar response in the biomedical research enterprise, with substantial new borrowings for the

construction of state-of-the-art research facilities and significant expansions of research faculty who, increasingly like their clinical colleagues, are expected to become substantially self-sustaining. Medical schools should take care that they are not inadvertently setting themselves up to import into their basic research and teaching programs the distortions, strains, and morale problems that presently afflict the clinical side of their houses.

References and Notes

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11. Quintile rankings were computed from data from the 2002 Liaison Committee on Medical Education Part IA questionnaire. Quintile ranking stratifies institutions into five categories: quintile 1 are schools in the top 20% of total direct research grants and contracts, quintile 2 represents schools in the next 20%, etc. The average amount of total research grants and contracts for quintile 1 schools was 8 times that of quintile 4 schools (\$283,570,009 versus \$34,445,789). See supporting online material for complete rankings.

Supporting Online Material

www.sciencemag.org/cgi/content/full/303/5657/476/DC1