

THE ROLE OF PATENTS AND COMMERCIALIZATION IN THE TENURE AND PROMOTION PROCESS

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Texas A&M created quite a stir in May 2006 when it added commercialization considerations as a sixth factor to be taken into account when faculty are evaluated for tenure. Somewhat surprisingly, their lead has not been followed, at least publicly, by other major institutions. At a recent meeting of academic associations, it emerged in conversation that a number of institutions of higher learning have moved in this direction, but without the publicity of Texas A&M. Therefore, we conducted a sampling survey to determine: 1) if other North American universities evaluate commercialization considerations when deciding faculty tenure and, if so, 2) what were the defining characteristics of these institutions. Study findings revealed that 16 universities in the US and Canada consider patents and commercialization in tenure and promotion decisions. The majority of these institutions have research budgets under \$200 million, have adopted changes to the tenure process within the last 6 years, and consider “US patents issued” a commercialization consideration priority. Surprisingly, study findings also found that a significant number of universities do not publish their tenure criteria. The application of similar studies to a wider range of North American educational institutions is encouraged to see how the trend started by these 16 universities may continue.

Key words: Patents; Commercialization; Tenure; Promotion; Early adopters

INTRODUCTION

Should patents and commercialization activities count towards tenure and promotion? The assumption was that many universities would be considering this question since the Texas A&M University System Board of Regents voted unanimously in May 2006 to consider faculty members’ commercialization success in tenure applications, which was reported widely in the media (6). Supporters of adding commercialization considerations such as patents, licenses, and commercial products into existing tenure/promotion criteria argue this will inspire tenure-track professors to engage in innovative activities earlier in their careers (10). The argument for this statement is that younger profes-

sors who are still in tenure-track positions will focus their efforts towards the tenure criteria their universities emphasize, potentially neglecting how their research may be translated into innovative new drugs, energy-saving technologies, and software products if patent and commercialization activities are not recognized (2,11). However, even the staunchest supporters of including faculty patent and commercialization activities in tenure/promotion applications agree that they should not replace scholarly pursuits such as teaching, student mentoring, and publications. According to Zachary Shulman, senior lecturer in entrepreneurship at Cornell University, if universities “factored in some minority percentage of 10% or 15%, that would be super” (11).

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In addition to potentially harvesting the most creative, productive, and innovative ideas of young professors, including patents and commercialization activities in university tenure applications has another more tangible benefit: increasing research dollars (4,8). For the 2009 fiscal year, universities earned approximately \$1.8 billion from royalties of academic inventions, a significant increase from 2008's \$1.6 billion and 2007's \$1.3 billion (excluding approximately \$800 million in payments made to New York University and Northwestern for future rights to drug royalties in 2007 and 2008, respectively). The most remarkable aspect of this statistic is that these revenues resulting from the work of university researchers engaged in innovative, translational research came at a time when states were reducing funding for higher education in record numbers (12). Projected figures for 2011 demonstrate that budget cuts for universities continue to grow in the wake of the continuing global financial crisis (5). By recognizing the importance of patents and commercialization in tenure/promotion criteria, North American universities may both encourage the application of academic inventions in real-world settings and provide their institutions with research development potential to forestall the effects of stifling budget cuts due to current and future economic recessions.

At a recent meeting of academic associations, it emerged in conversation that a number of major institutions have moved to include patent and commercialization activities in tenure/promotion applications, but without the publicity generated by Texas A&M. For instance, the University of Virginia's School of Medicine recently revised its Promotion and Tenure Policy to include criteria related to patenting and commercializing research discoveries and the University of North Carolina at Chapel Hill's School of Pharmacy made a similar change a few years ago (personal communication with Mark Crowell). Therefore, we conducted a pilot study to survey North American educational institutions in order to gauge the extent to which patents and/or commercialization considerations have been adopted.

MATERIALS AND METHODS

Sampling

The Association of University Technology Managers (AUTM) graciously granted us access to their

"Directors List," a listing of around 900 individuals heading academic technology transfer offices around the world. Three hundred and fifteen of these were located in the US and Canada and constituted our primary mailing list.

We launched the survey on December 7, 2010. Reminders were sent on December 21, 2010 and January 12, 2011, and the survey was closed on January 15, 2011. Our sampling frame was 108 universities, teaching hospitals, not-for-profit research institutes, and government laboratories in the US and Canada who potentially used commercialization considerations when deciding tenure and/or promotion of faculty and staff.

Survey

Responses to a survey cosponsored by AUTM and the National Academy of Inventors (NAI) consisting of 33 questions relating to commercialization tenure/promotion considerations were received from 94 US and 14 Canadian institutions. Eighty-seven of the respondents were universities, 13 were nonprofit research institutes, three were teaching hospitals, and two were government laboratories.

Total research budgets of all universities except Washington State University (WSU) were self-reported. WSU data were obtained from "R&D expenditures at universities and colleges, ranked by FY 2008 R&D expenditures" via the National Science Foundation (7). The Lawrence Berkeley National Lab and National Science Foundation were dropped from statistical analysis due to small sampling size and nonconformance with the majority of data as they were the only US federal government-owned institutions represented.

In summary, 106 institutions were included in the data analysis (92 US institutions; 14 Canadian institutions). Eighty-eight of the institutions did offer tenure. Sixty-five of these universities completed the survey by providing data relating to their research budgets, whether they were state or private institutions, how commercialization considerations—particularly patents—were viewed when deciding tenure/promotion for faculty and staff, and if tenure/promotion criteria at their institutions were published. Universities who indicated that commercialization considerations were a factor in tenure/promotion criteria were asked to indicate which of the following aspects of commercializa-

tion were used: 1) disclosures submitted, 2) US patent application filed, 3) US patents issued, 4) foreign patent applications filed, 5) foreign patents issued, 6) licenses executed, 7) license income received, 8) industrially sponsored research received, 9) companies started, and 10) other.

The 94 US institutions that responded employed 676 professional staff and had research budgets totaling \$21.6 billion. Comparing these results with the FY2008 AUTM Licensing Survey (1) shows that the respondents to our survey accounted for approximately 65% of professional staff employed in all US technology transfer offices and 42% of total research funding at US institutions.

Seventy-five of the US institutions offered tenure; 4 were nonprofit research institutes affiliated with universities; the remaining 71 were universities. The tenure-granting institutions had research budgets totaling \$20.0 billion, 95% of the total of the institutions reporting to our survey.

The questionnaire was structured so that institutions that did not offer tenure skipped the detailed questions and were thanked for their participation. The result was that approximately 50 responses were received for the detailed questions about tenure practices at institutions that did offer tenure.

Analysis

Data analysis using descriptive summary statistics and comparison of means of research dollars was performed using IBM SPSS Statistics 19. Universities were the unit of analysis.

RESULTS

Commercialization Considerations and Research Dollars

Of the 65 reporting universities, the majority ($n = 49$; 75%) do not include commercialization considerations in tenure/promotion criteria (i.e., "no" universities). These universities have a mean budget significantly higher than those universities that do include commercialization consideration ($n = 16$) in tenure and/or promotion criteria (i.e., "yes" universities) (Fig. 1). The mean research budget for "yes" universities was \$147 million with the mean research budget for "no" universities at \$270 million (Fig. 2). This is a significant difference in re-

search dollars ($p < 0.0001$), suggesting that "yes" universities may be early adopters to facilitate research growth. All of the "yes" institutions who responded were US and Canadian universities (i.e., no teaching hospitals, not-for-profit research institutes, or government laboratories analyzed took into account commercialization considerations in tenure/promotion criteria).

Additionally, of the 15 institutions that reported commercialization considerations in the list of factors taken into account for *tenure* criteria, nine also reported commercialization considerations taken into account for *promotion* criteria. Thompson Rivers University, University de Moncton, Brigham Young University, Ohio University, University of North Carolina Greensboro, and University of Saskatchewan were the six institutions that did not use commercialization considerations as part of both faculty tenure and staff promotion deliberations. Of the 10 institutions that reported using commercialization considerations in the list of factors taken into account for promotion criteria, only one—New York University—did not include these considerations in tenure criteria.

Two universities that take commercialization considerations into account when evaluating tenure and/or promotion—University of Illinois at Urbana-Champaign and New York University—are significantly above the research dollar mean for "yes" universities with an annual research budget of \$564 and \$309 million, respectively (Fig. 2).

Early Adopters

The mean and median year at which commercialization considerations were first incorporated by the "yes" universities is 2005, indicating the majority of tenure/promotion changes are recent. Also of note, six US and Canadian universities began incorporating commercialization considerations for faculty tenure before 2006 (i.e., before Texas A&M garnered so much publicity with their May 2006 announcement). These six institutions—University of Nebraska-UNeMed Corporation (1998), Medical College of Wisconsin (2000), University de Moncton (2000), University of Saskatchewan (2002), Utah State University (2004), and George Mason University (2005)—in addition to Texas A&M, should be considered the early adopters of commercialization considerations in the ten-

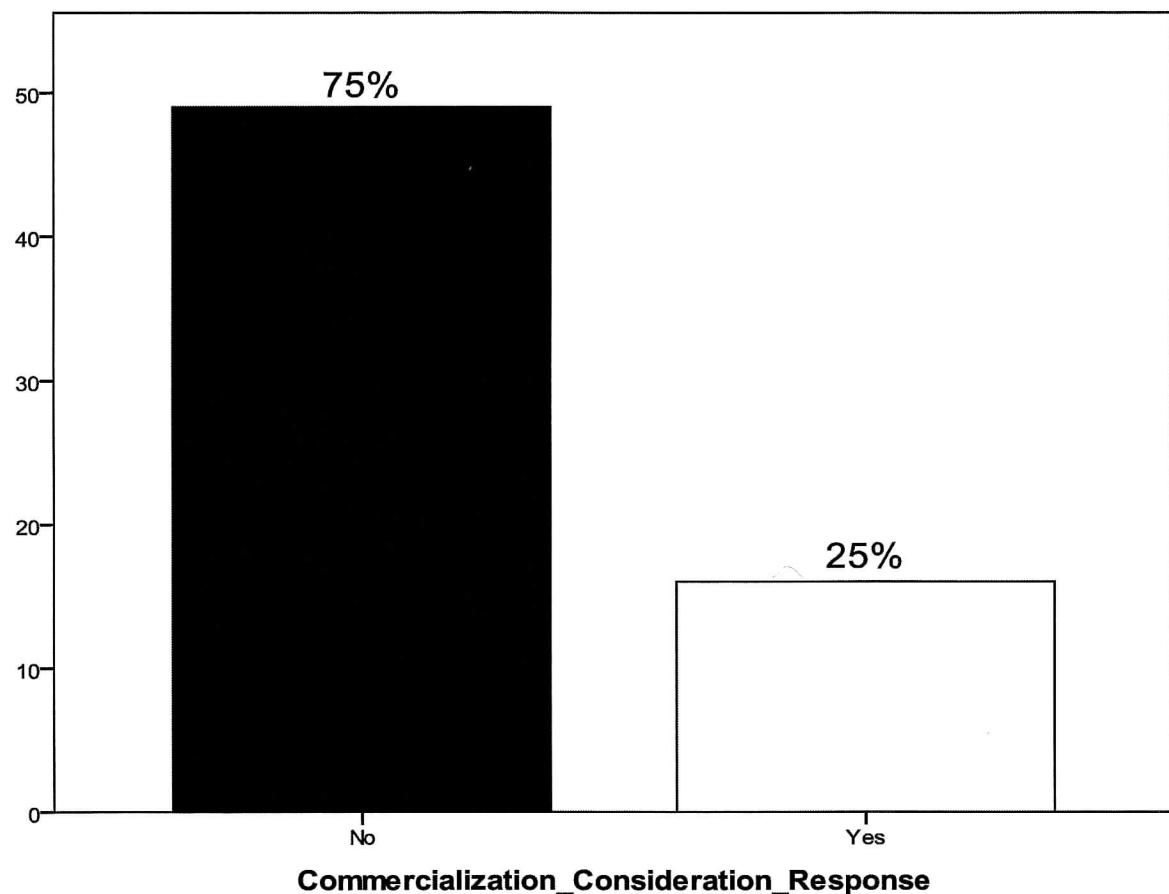


Figure 1. Of the 65 reporting universities, the majority ($n = 49$; 75%) responded that they *do not* include commercialization considerations in tenure and/or promotion criteria. Sixteen (25%) *do* include commercialization consideration in tenure and/or promotion criteria.

ure process by adding to the diversity of measurements by which faculty tenure and/or promotion decisions are based. Given that these six early adopting institutions have a mean research budget of \$125 million (lower than the mean research budget of both "yes" and "no" universities), we propose that adding commercialization considerations to the tenure/promotion process may be the method by which smaller universities aim to grow their research budgets.

Commercialization Factors Considered

Out of the 16 "yes" universities, the majority included "US patents issued" ($n = 12$) and "US patent applications filed" ($n = 11$) in their review and used four or more factors of commercialization in their decisions (Fig. 3). Additionally, the mean re-

search budget for the remaining four "yes" universities that *do not* consider "US patents issued" as part of tenure/promotion commercialization criteria is \$255 million. Mean research budget for the 12 "yes" universities that *do* consider "US patents issued" as part of promotion commercialization criteria is \$187 million. Again, this is a significant difference in research dollars ($p < 0.0001$), perhaps reinforcing the idea that universities that consider commercialization criteria—particularly "US patents issued"—in tenure/promotion decisions may be early adopters to facilitate research growth at their universities.

Nontransparency of Tenure/Promotion Process

Quite surprisingly, we found that 25 (out of 58 respondent universities) do not publish their tenure

and promotion criteria. That is, 43% of survey responders do not offer faculty/staff at their institutions easy access to the specific criteria upon which their tenure/promotion applications will be based. This indicates the nontransparency of the tenure process for thousands of university faculty in the US and Canada (13). Nontransparent tenure/promotion process proceedings contribute not only to employee confusion regarding their performance expectations, but also play into the hands of heavily cited critics of university faculty tenure who argue it is an outmoded concept on the basis of "the secrecy and inflexibility of the tenure process" (3). Eleven (69%) of the 16 "yes" universities do publish their criteria. While this number is still lower

than expected it is almost 30% percent higher than "no" universities included in our survey, perhaps indicating that institutions that value the commercialization activities of their faculty are also committed to a transparent tenure/promotion process.

The majority of "yes" universities ($n = 12$) surveyed are public, while the remaining four—Brigham Young, Medical College of Wisconsin, Wake Forest University Health Sciences, and New York University (all US institutions)—are private. Unsurprisingly, those 11 "yes" universities that do publish their tenure/promotion criteria are all public universities (with the exception of Wake Forest University Health Sciences). However, the five "yes" universities that do not publish their tenure/

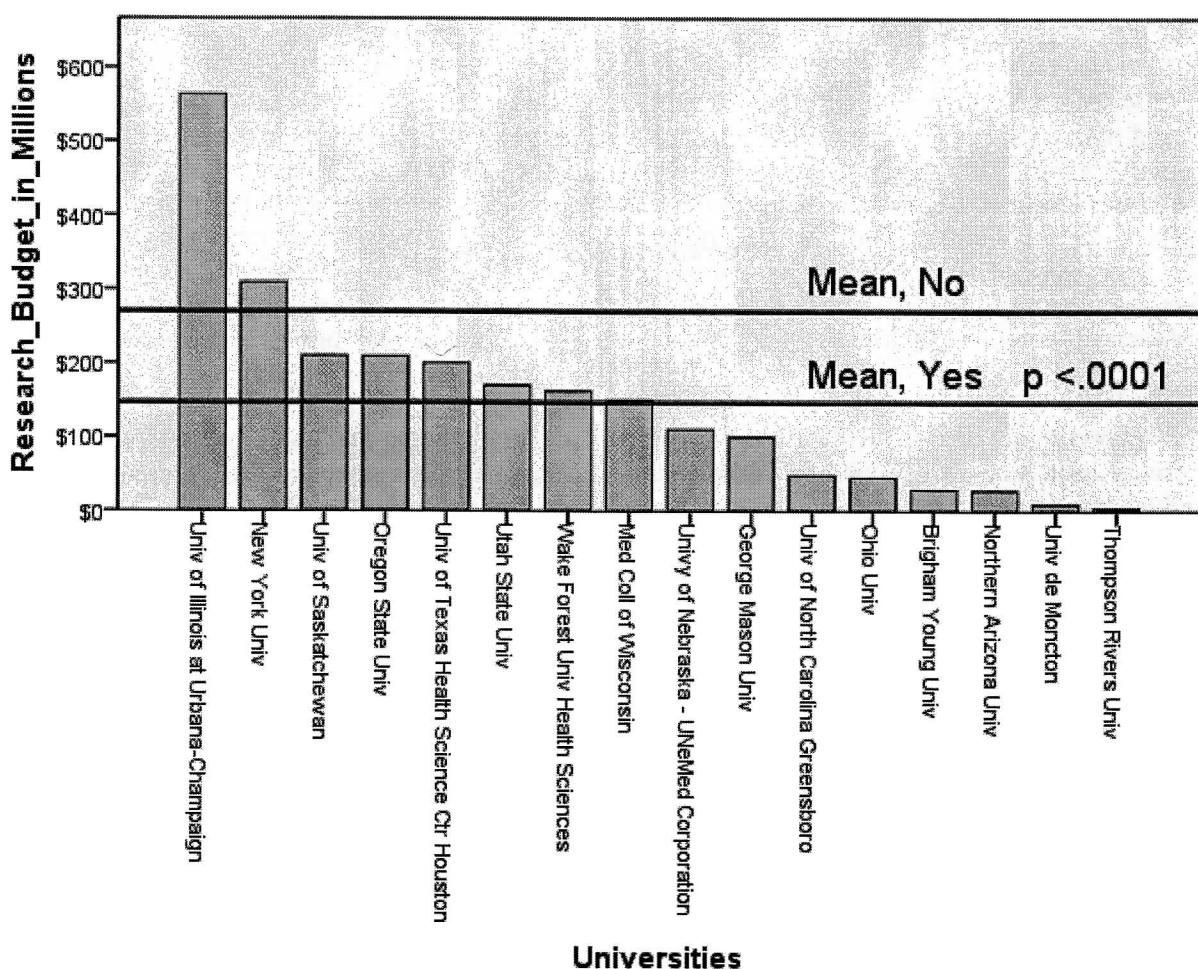


Figure 2. Lower horizontal line indicates the mean research budget for universities that *do* include commercialization considerations in tenure and/or promotion criteria ($n = 16$) at \$147 million. The upper horizontal line indicates the mean research budget for universities responding that they *do not* include commercialization considerations in tenure and/or promotion criteria ($n = 49$) at \$270 million. The difference in means is significant at the $p < 0.0001$ level.

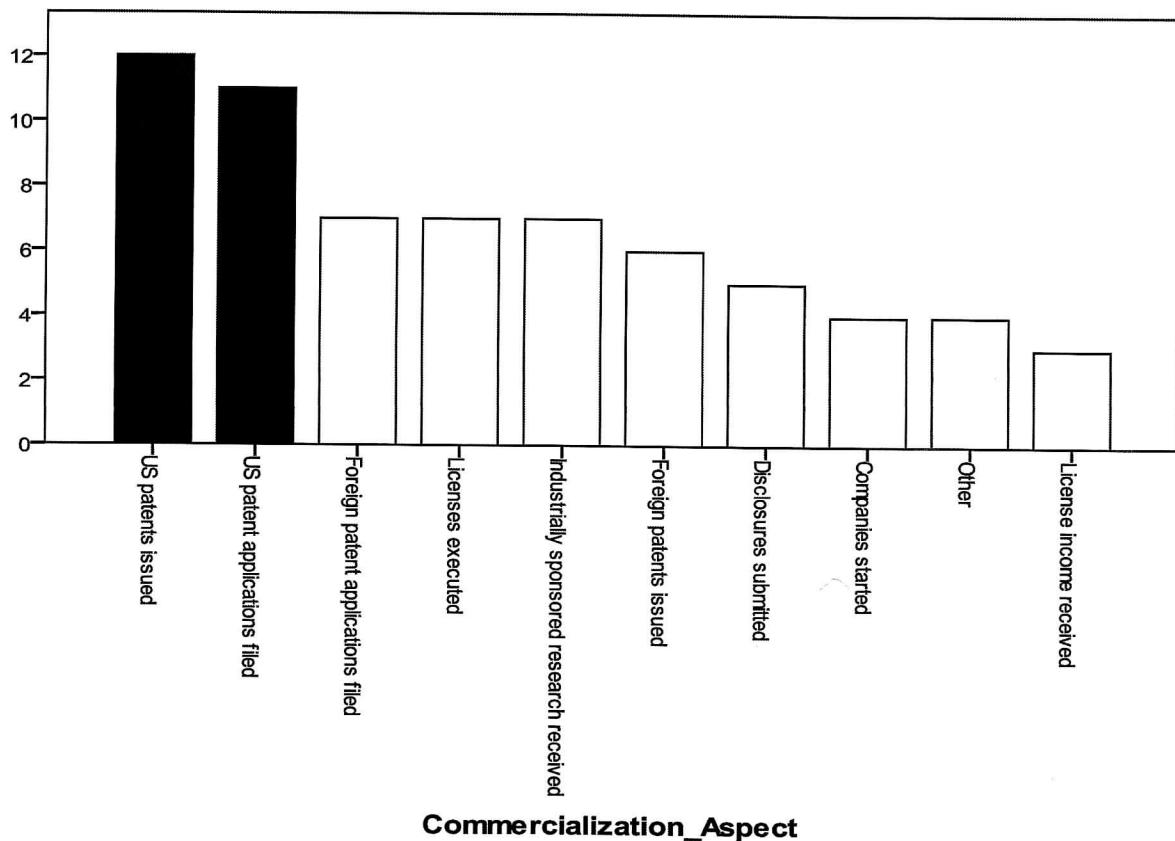


Figure 3. Out of the 16 universities who reported using commercial considerations in tenure and/or promotion criteria, the majority included “US patents issued” ($n = 12$) and “US patent applications filed” ($n = 11$) in their review.

promotion criteria were just as likely to be public or private institution (i.e., two public Canadian universities and three private US universities represented).

DISCUSSION

Although we expected that the majority of surveyed institutions did not include commercialization criteria in their tenure/promotion process, we were surprised by how many universities currently do (25% of our sample). Given these preliminary findings, we expect that a larger sampling base of North American universities would reveal more institutions that currently expand the criteria for faculty tenure and/or promotion to include the 10 aspects of commercialization discussed in this article. This would add to our list of early adopters whose tenure/promotion criteria reward diverse faculty portfolios. We also expected the gap in research

dollars between “no” and “yes” universities to be larger. Perhaps sampling data from our pilot study was skewed due to the considerably higher research budgets of University of Illinois at Urbana-Champaign and New York University than the remaining 14 universities in our sample that currently recognize commercialization considerations in the tenure/promotion process.

Despite this, a significant gap in research dollars between “no” and “yes” universities still exists. This suggests to us that expanding the criteria for tenure/promotion may not be important for well-established institutions, but may be vital for those growing their research enterprise by looking for ways to increase innovation in bringing in research funding. Those universities that do take into account commercialization considerations when evaluating tenure/ promotion display striking similarities in that the majority: 1) have research budgets below the mean of reporting institutions, 2) are

public, 3) consider US patents a priority, 4) adopted new criteria within the last 6 years, and 5) publish their tenure/promotion guidelines. Although Texas A&M did not respond to the survey, they would have been a "yes" university with a research budget of approximately \$631 million, increasing our mean by \$28 million, but still with a significant difference between "no" and "yes" universities.

These findings indicate that, despite lack of publicity, many universities are attempting to change the culture from research and publishing as measures for promotion and tenure to also recognizing academic entrepreneurs who translate their research into patents, licenses, and commercial products. This is merely the beginning of a long overdue conversation on whether or not traditional measures for gauging faculty success continue to remain relevant in today's rapidly changing, technologically driven world.

However, many university tenure policies continue to reflect the traditional view that patent and commercialization activities by faculty members will either detract from their teaching, laboratory, and student mentoring obligations or pose a conflict of interest in regard to revenue generation. While these concerns should remain part of the conversation, universities need to also consider expanding the traditional role of their faculty and staff in order to play a larger role in global economic development. By investing in the creative innovations of young faculty today, educational institutions may lessen the pressure to translate their research endeavors into useful, applicable, and timely solutions to contemporary global concerns.

Some universities, such as the Georgia Institute of Technology, accepting of faculty commercialization activities, encourage staff to pursue this option only once tenure has been achieved (11). While this is a step in the right direction, policies such as these do not recognize the potential and stamina of young academics to approach problems in new and innovative ways. What new life-saving, inspiring, and technologically relevant inventions would result from 21st century academic minds encouraged early in their careers by their universities to expand the definition of what is considered important intellectual activities?

The next step beyond recognizing faculty patent

and commercialization endeavors will be to allocate proper resources to university technology transfer offices (TTOs) in order to transfer scientific knowledge from academics to practitioners. As the work of Siegel et al. demonstrates, TTOs must be given proper staff, compensation, and rewards for participating in technology transfer activities in order to realize the full benefits that may be reaped from faculty patent and commercialization activities (9).

This article presents the results of a small-scale survey to gauge the current academic climate regarding commercialization considerations when deciding faculty tenure/promotion. Texas A&M, whose 2005 initiative inspired our survey and other institutions known anecdotally to offer tenure in at least some schools, such as the University of Virginia and the University of North Carolina at Chapel Hill, did not respond to our survey, so we do not consider our data to provide a statistically valid picture of US academic practice overall; however, we hope our pilot study will encourage others to see if the results discussed here have broader applicability to their own institutions. More detailed analysis is now needed to see how the trend started by the 16 universities highlighted in this article may continue.

DISCLOSURE: P.R.S. is Editor-in-Chief of *Technology and Innovation*. This article was subject to peer review by anonymous reviewers.

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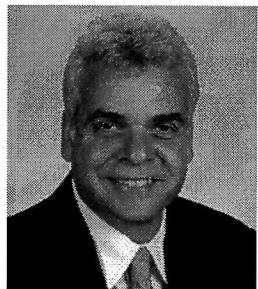


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