

## POLICY

# Medical Faculty Development: A Modern-Day Odyssey

Mary C. Beckerle,<sup>1\*</sup> Kathryn L. Reed,<sup>2</sup> Rosalyn P. Scott,<sup>3</sup> Mary-Ann Shafer,<sup>4</sup> Dena Towner,<sup>5</sup> Hannah A. Valantine,<sup>6</sup> Nancy R. Zahniser<sup>7</sup>

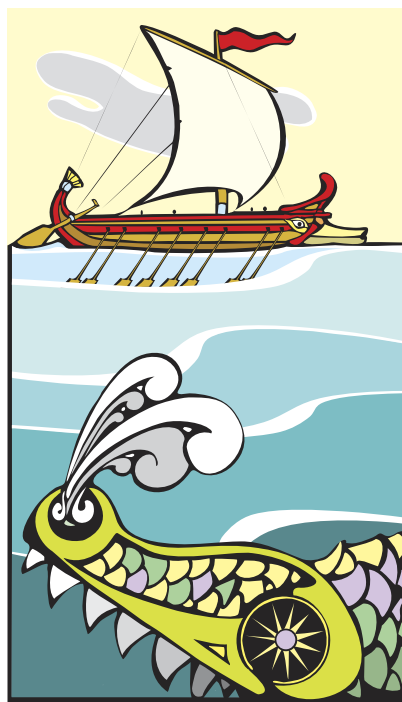
Academic medical centers (AMCs) are pillars of the community; they provide health care, create jobs, educate biomedical professionals, and engage in research and innovation. To sustain their impact on human health, AMCs must improve the professional satisfaction of their faculty. Here, we describe ways to enhance recruitment, retention, creativity, and productivity of health science faculty.

Academic medical centers (AMCs) conduct biomedical research; educate tomorrow's health care providers and pioneers in clinical and translational science; serve as models for delivery of state-of-the-art health care; and contribute to policy development, peer review, and community education. The success of this work requires recruitment, retention, and development of talented people in an organizational climate that stimulates creativity and productivity. Although AMCs devote countless hours to teaching, research, and patient care, less attention has historically been paid to factors that enhance professional fulfillment. In this Commentary, we discuss ways in which AMCs can improve the quality of life—and thus productivity—of their faculty.

## CULTIVATING PRODUCTIVE FACULTY

Faculty members in AMCs are suffering. A recent survey of nearly 2000 medical school faculty at both private and public institutions in the United States found high levels of anxiety, depression, and job dissatisfaction among the respondents (1). Both basic scientists and academic physicians appeared vulnerable to work strain, with younger faculty showing

the highest levels of discontent. Our medical centers simultaneously face unprecedented uncertainty as a result of the impending impact of health care reform and a challenging research-funding climate. Professional development timelines and pathways that were well trodden in the past seem precarious if not untenable going forward. These challenges clearly necessitate new career models and updated metrics of professional success. We propose six strategies—referred to as the Nepenthe principles—to enhance faculty quality of life, with the goal of improving recruitment, satisfaction, retention, and productivity. Borrowed from Homer's *Odyssey*, nepenthe is an antidote to suffering (Fig. 1).



**Fig. 1. Homer's *Odyssey*:** A tale of challenge, teamwork, creativity, and perseverance.

## THE NEPENTHE PRINCIPLES

**1. Value the contributions of individuals and teams.** Advances in biomedical science have traditionally depended on the creative research of productive individuals. Thus, career advancement mechanisms within AMCs are designed to reward individual accomplishment. Although the contributions of single principal investigators remain invaluable, the advancement of time-sensitive biomedical research agendas requires multidisciplinary collaborative teams with expertise in human physiology, cellular biochemistry, bioengineering, clinical trial design, imaging, genomics, informatics, and other scientific specialties. Moreover, with an expanding biomedical research workforce and shrinking federal funding for research, a shift toward team science seems inevitable as a practical solution to engage more faculty members on fewer grants. The growing emphasis on collaboration highlights the importance of developing best practices for establishing and rewarding teams and on defining new metrics for faculty success.

Academic biomedical researchers can draw on the extensive experience of for-profit companies, which routinely assemble project teams and assess their performance. Research in multinational corporations has identified contributors to team success, including modest group size, geographical proximity of group members, and clarity regarding the roles of individual project-team members (2). Studies of team dynamics and effectiveness in the business world also reveal challenging paradoxes. For example, although a primary advantage of teamwork is the high level of expertise that can be assembled, the greater the proportion of highly educated experts on a team, the higher the probability of conflict and stalemate. With its high degree of professional expertise and educational credentials, academic medical research would benefit from a proactive approach that includes coaching team members in conflict management and communication skills. A study by researchers at the Kellogg School of Management identified common success parameters of scientific and artistic teams and concluded that groups with a mix of incumbents and newcomers, as well as with diverse member expertise, fared best (3). These findings suggest that balancing long-standing working relationships with novel membership is crucial for success, as too much familiarity may breed mediocrity rather than fresh thinking, and too little familiarity may limit trust and open participation.

<sup>1</sup>Huntsman Cancer Institute, University of Utah, Salt Lake City, UT 84112, USA. <sup>2</sup>Department of Obstetrics and Gynecology, University of Arizona College of Medicine, 1501 North Campbell Avenue, Tucson, AZ 85724, USA. <sup>3</sup>Boonshoft School of Medicine and College of Engineering and Computer Science, Wright State University, Dayton VA Medical Center, Dayton, OH 45428, USA. <sup>4</sup>Division of Adolescent Medicine, Department of Pediatrics, University of California, San Francisco, 3333 California Street, Suite 245, San Francisco, CA 94941, USA. <sup>5</sup>Maternal Fetal Medicine, Department of OB/GYN, University of California, Davis, Sacramento, CA 95817, USA. <sup>6</sup>Stanford University School of Medicine, Stanford, CA 94305, USA. <sup>7</sup>Department of Pharmacology, School of Medicine, University of Colorado, Aurora, CO 80045, USA.

\*Corresponding author. E-mail: mary.beckerle@hci.utah.edu

Mechanisms for recognizing and rewarding collaboration within academic medicine appear to be lagging behind enthusiastic institutional rhetoric. Young faculty members report fear that engagement in team science will compromise bids for promotion and tenure (4). Maximizing participation in teams requires the revision of institutional promotion and tenure criteria to encourage and reward contributions to group efforts. The U.S. National Institutes of Health has assumed a leadership position in addressing this challenge by creating administrative mechanisms to recognize multiple principal investigators on federally funded research projects, a move that facilitates assignment of responsibility and leadership credit to multiple individuals. Administrative mechanisms within AMCs, such as equitable sharing of team leadership positions and indirect costs, would facilitate and advance interinstitutional and other major research projects. The \$500 million experiment of the Howard Hughes Medical Institute's Janelia Farm Research Campus, modeled on the successes of Bell Laboratories and the Medical Research Council, aims to change the research culture by rewarding collaboration and collegiality and by providing substantial program support and other incentives to participants (5).

In addition to the anticipated benefits of enhancing innovation and engaging larger numbers of faculty, team-oriented science may also increase job satisfaction. In a recent study, team members reported having a substantially enhanced appreciation of their unit's strategic vision (6), an attribute linked to higher levels of professional engagement and productivity. Institutional support of teams must be balanced by ongoing support of individual excellence, recognizing that success is greatest when diverse approaches toward common goals are allowed to flourish.

**2. Nurture the young.** Successful mentoring programs designed to develop career and leadership skills in the next generation of AMC faculty are associated with increased job satisfaction, increased productivity, and improved rates of promotion and retention of junior faculty (1, 7). The lack of effective faculty development initiatives has been identified as a powerful predictor of faculty dissatisfaction. To ensure successful scholarship, there must be a robust support infrastructure that includes formal and informal mechanisms for mentoring; initial research funding for early-career scientists; protected

time for the development of research projects and teaching programs; and clear evaluation metrics for promotion and tenure.

Institutional leaders must be full partners with their faculty in support of innovation. Creative scientists are more likely to engage in visionary, potentially high-impact research if they have confidence that their institutions will measure the quality of their ideas and efforts and not rely exclusively on standard metrics of success such as timely, high-impact publication and gap-free grant support, both of which are failure-intolerant. Institutions cannot expect to realize the benefits of so-called high-risk, high-reward research programs if they are unwilling to support risk assumption by their faculty.

**3. Integrate the personal and professional.** Academicians lead layered lives, with the challenge of facing tenure requirements concurrent with raising families and caring for elders. Conflict between personal and professional commitments can be a major stressor that negatively influences performance as well as personal health and well-being. An environment that is supportive of family life reduces this conflict and enhances workplace satisfaction, conditions that attract and retain faculty. Again, the corporate world has recognized the added value of work-life integration. Many businesses that have been rated as one of the “best companies to work for” have an array of family-friendly amenities such as on-site child care and home catering, post office, dry cleaning, pharmacy, and exercise facilities. The American Association of University Professors has called for transformation of the academic workplace into one that sustains the family by providing support for child and elder care as well as flexible work policies and schedules. To facilitate interactions of early-career scientists with colleagues in their fields, as well as increase their national or international visibility, some programs provide funds that support the ability of new parents to bring children and nannies to scientific conferences. Scientific societies are also stepping up in this arena. For example, the American Society for Cell Biology accepts applications for grant support to offset the costs of child care for presenters at their annual meeting.

One special challenge for faculty is the timing of tenure considerations and the ticking of the biological clock. Academic scientists often receive their first faculty positions and principal-investigator grant

between the ages of 30 and 40 years. Having children has been shown to disadvantage women disproportionately in tenure considerations (8). To address this issue, many institutions have adapted tenure policies to include more extensive tenure probationary periods for primary caregivers. Institutions must identify ways to eliminate the stigma associated with delaying the tenure clock and to be flexible in designing tenure delays according to childbearing and other major life circumstances. Recognizing that a major barrier to the advancement of women in AMCs is maintaining research productivity in the child-rearing years, Massachusetts General Hospital established the Claflin Distinguished Scholar Award to provide financial support for research personnel of female faculty members who have young children. This support helps to keep the science moving forward during this time-intensive parenting period.

**4. Create inclusive communities.** Management science emphasizes the importance of inclusion for success. In inclusive business communities, all employees, regardless of demographics, have a full opportunity to reach their highest professional potential and contribute unique talents to an organization. A culture of inclusion is important to engage the full diversity of existing faculty within academic medicine in order to capitalize on the breadth of ideas, perspectives, and experiences of all human resources.

Even more importantly, a culture of inclusion is essential for the very future of the profession. The U.S. population is quickly advancing toward “majority minority” status. It is well established that young people scan the landscape for evidence that people who look like them are succeeding in their chosen field. At present, underrepresented minorities are even more underrepresented in the faculties of AMCs than in the general population, a situation that does not create a welcoming environment for the next generation of minority students.

In academic medicine, women experience slower career advancement and less representation at top leadership levels relative to men (9) and describe conditions of professional isolation that adversely impact productivity, job satisfaction, and retention. A positive climate—defined as one in which there is collaboration, cooperation, respect, and collegiality—is particularly important for enhancing work outcomes for female scientists. Perceptions of a positive, non-sexist climate are associated with increased

job satisfaction, productivity, and “felt influence” over unit decisions, resources, and culture. Women who work in science departments that are rated as cooperative and collegial report more engagement in their work, connection to peers, and ability to develop their professional potential.

### 5. Develop enlightened leadership.

The priorities and management policies of its leadership shape an institution's culture. Practices that support a culture of collegiality include fair and equitable faculty relations, transparent decision-making processes, use of the chair role in service to the department, hosting of department-level social events, and fostering of faculty career development. Recent work also highlights the power of humility in transformative leadership (10). World leaders Mahatma Gandhi, Nelson Mandela, and Vaclav Havel explicitly emphasized the importance of humility and service in leadership. In contrast, in selection of its leadership AMCs have historically emphasized scientific accomplishment over factors such as emotional and social intelligence, attributes that have been shown to be important determinants of effective leadership (11). The cultivation of leadership as a key aspect of “organizational capacity” will support the development of relationships and human networks to enhance cooperation, peer support, and resource exchange.

**6. Emphasize service.** Many faculty members explicitly value opportunities to “give back,” both as an affirmation of their own life's work and in gratitude for the opportunities they have been given during their careers. This motivation may be stimulated in part by “enlightened self-interest,” as emerging evidence shows that people who give are happier than those who do not (12). Opportunities for service activities include work internal to the institution (for example, committee participation and review of colleagues' grants and papers) and external to the institution (for example, work with K–12 students, service at free clinics, participation in peer review, contributions within scientific societies, and engagement in community outreach activities). Faculty members often note that service activities

are not explicitly valued in their institutions. Assurance that opportunities for service are available and appreciated in the academic enterprise provides a means of attracting and retaining faculty talent in AMCs.

### SAILING FORWARD

These six principles may seem like common sense. However, many challenges exist in the prevailing culture of AMCs that prevent implementation. It is sometimes argued that many important discoveries have been made in environments that were devoid of mentoring, which subliminally suggests that mentoring is for the weak. Further, when mentoring falls into an unfunded mandate category it is easy to appreciate why it might receive lower priority by potential mentors than activities such as patient care, teaching, research, and formally recognized institutional service. Recent efforts to highlight the value of transdisciplinary teams have been met with some pushback from those who note that individual contributions may be obscured and creativity blunted by excessive concentration on teamwork. Concern is sometimes expressed that being more inclusive will require lowering standards of excellence and that spending time on service activities distracts from research. Lastly, given the highly competitive nature of science and medicine, some believe that success requires one to sacrifice personal life for professional success.

Despite the cultural challenges noted above, we suggest that adoption of the Nephthe principles as core values will support a positive transformation of our institutions. Such a transformation will require financial resources, time, and the discomfort of change. However, the costs will be greatly outweighed by benefits to a greater good—an increase in satisfaction that enhances faculty recruitment, retention, and productive scholarship. There is no time like the present to invest in the future of our AMCs. Advances in biomedical research have created a fertile ground to develop the novel therapies and individualized prevention strategies destined to enhance human health. Our ability to capitalize on these opportunities depends on a skilled, creative, productive, and sustainable biomedical research work-

force. It is time to dedicate ourselves to making the cultural changes needed to enhance quality of life for our current AMC faculty. In addition to supporting those who have already chosen biomedical research and academic medicine as a career path, improved professional satisfaction of current faculty will be critical for attracting the next generation to our profession.

### REFERENCES AND NOTES

1. B. A. Schindler, D. H. Novack, D. G. Cohen, J. Yager, D. Wang, N. J. Shaheen, P. Guze, L. Wilkerson, D. A. Drossman, The impact of the changing health care environment on the health and well-being of faculty at four medical schools. *Acad. Med.* **81**, 27–34 (2006).
2. L. Gratton, T. J. Erickson, 8 ways to build collaborative teams. *Harv. Bus. Rev.* **85**, 100–109, 153 (2007).
3. R. Guimerà, B. Uzzi, J. Spíro, L. A. Amaral, Team assembly mechanisms determine collaboration network structure and team performance. *Science* **308**, 697–702 (2005).
4. Committee on Facilitating Interdisciplinary Research, National Academy of Sciences, National Academy of Engineering, Institute of Medicine, *Facilitating Interdisciplinary Research* (The National Academies Press, Washington, DC, 2004).
5. G. M. Rubin, Janelia Farm: An experiment in scientific culture. *Cell* **125**, 209–212 (2006).
6. R. K. Grigsby, D. G. Kirch, Faculty and staff teams: A tool for unifying the academic health center and improving mission performance. *Acad. Med.* **81**, 688–695 (2006).
7. D. Sambunjak, S. E. Straus, A. Marusić, Mentoring in academic medicine: A systematic review. *JAMA* **296**, 1103–1115 (2006).
8. M. A. Mason, M. Goulden, Marriage and baby blues: Redefining gender equity in the academy. *Annals AAPSS* **596**, 86–103 (2004).
9. A. L. Wright, L. A. Schwindt, T. L. Bassford, V. F. Reyna, C. M. Shisslak, P. A. St. Germain, K. L. Reed, Gender differences in academic advancement: Patterns, causes, and potential solutions in one U.S. College of Medicine. *Acad. Med.* **78**, 500–508 (2003).
10. J. Collins, Level 5 leadership. The triumph of humility and fierce resolve. *Harv. Bus. Rev.* **79**, 66–76, 175 (2001).
11. D. Goleman, Leadership that gets results. *Harv. Bus. Rev.* **78**, 78–90 (2000). <http://hbr.org/2000/03/leadership-that-gets-results/ar/1>.
12. E. W. Dunn, L. B. Aknin, M. I. Norton, Spending money on others promotes happiness. *Science* **319**, 1687–1688 (2008).
13. **Acknowledgment:** As the initial ideas for this commentary were developed, the authors were participants in the Hedwig van Ameringen Executive Leadership in Academic Medicine Program for Women.

10.1126/scitranslmed.3002763

**Citation:** M. C. Beckerle, K. L. Reed, R. P. Scott, M.-A. Shafer, D. Towner, H. A. Valantine, N. R. Zahniser, Medical faculty development: A modern-day odyssey. *Sci. Transl. Med.* **3**, 104cm31 (2011).

# Science Translational Medicine

## Medical Faculty Development: A Modern-Day Odyssey

Mary C. Beckerle, Kathryn L. Reed, Rosalyn P. Scott, Mary-Ann Shafer, Dena Towner, Hannah A. Valentine and Nancy R. Zahniser

*Sci Transl Med* **3**, 104cm31104cm31.  
DOI: 10.1126/scitranslmed.3002763

ARTICLE TOOLS	<a href="http://stm.sciencemag.org/content/3/104/104cm31">http://stm.sciencemag.org/content/3/104/104cm31</a>
REFERENCES	This article cites 11 articles, 2 of which you can access for free <a href="http://stm.sciencemag.org/content/3/104/104cm31#BIBL">http://stm.sciencemag.org/content/3/104/104cm31#BIBL</a>
PERMISSIONS	<a href="http://www.sciencemag.org/help/reprints-and-permissions">http://www.sciencemag.org/help/reprints-and-permissions</a>

Use of this article is subject to the [Terms of Service](#)

---

*Science Translational Medicine* (ISSN 1946-6242) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. The title *Science Translational Medicine* is a registered trademark of AAAS.

Copyright © 2011, American Association for the Advancement of Science