

# An Innovative Program to Train Health Sciences Researchers to Be Effective Clinical and Translational Research Mentors

Mallory O. Johnson, PhD, Leslee L. Subak, MD, Jeanette S. Brown, MD, Kathryn A. Lee, RN, PhD, and Mitchell D. Feldman, MD, M Phil

## Abstract

The creation of the Clinical Translational Science Awards for academic health sciences campuses in 2006 was implicitly accompanied by a call for a new paradigm of faculty development and mentoring to train the next generation of researchers and leaders in this new approach to research. Effective mentoring is critical to help early-career investigators become successful, independent researchers, and a new approach to mentoring is vital to recruit, advance, and retain fellows and junior faculty engaged in clinical and

translational research. However, in addition to the many rewards of mentoring, there are numerous substantive barriers to effective mentoring. These barriers include a lack of training in how to be a mentor, lack of time and structural and financial support for mentoring, and competing personal, administrative, and clinical demands.

The authors describe an innovative program, the University of California, San Francisco Mentor Development Program (MDP), established in 2006 and designed

to train midcareer academic health sciences researchers to be more effective as clinical and translational research mentors. Using a framework for presenting innovations in academic research, they present the rationale, design, implementation, and mechanisms being used to evaluate and sustain the MDP. Specific details of the objectives and content of the MDP sessions are provided as well as evaluation criteria and a link to specific curriculum materials.

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**T**he University of California, San Francisco (UCSF) Clinical Translational Science Institute (CTSI), created in 2006 as a result of the Clinical Translational Science Awards given by the National Institutes of Health (NIH), was charged with the creation of a new mentor

**Dr. Johnson** is associate professor, Department of Medicine, University of California, San Francisco, San Francisco, California.

**Dr. Subak** is associate professor, Departments of Obstetrics, Gynecology and Reproductive Sciences; Epidemiology and Biostatistics; and Urology, University of California, San Francisco, San Francisco, California.

**Dr. Brown** is professor, Departments of Obstetrics, Gynecology and Reproductive Sciences; Epidemiology and Biostatistics; and Urology, University of California, San Francisco, San Francisco, California.

**Dr. Lee** is professor and Livingston Chair, Department of Family Health Care Nursing, University of California, San Francisco, San Francisco, California.

**Dr. Feldman** is professor of medicine and UCSF Director of Faculty Mentoring, Department of Medicine, University of California, San Francisco, San Francisco, California.

Correspondence should be addressed to Dr. Feldman, Division of General Internal Medicine, Department of Medicine, University of California, San Francisco, 400 Parnassus Ave., San Francisco, CA 94143-0320; telephone: (415) 476-2428; fax: (415) 476-7964; e-mail: mfeldman@medicine.ucsf.edu.

training program for clinical and translational research (CTR) faculty members. Using a framework for presenting innovations in academic research,<sup>1</sup> we present the rationale, design, implementation, and mechanisms to evaluate and sustain the resulting program, the UCSF Mentor Development Program (MDP).

## Problematic Trends

The creation of the CTSI itself was in part a response to the trend over the past few decades in which there has been a decline in the number of investigators conducting clinical and translational research.<sup>2</sup> It has been especially challenging for academic health centers to recruit and retain faculty members from underrepresented minority groups.<sup>3</sup> The cause of these trends is varied and includes the lure of salaries offered by clinical practice and industry that are higher than those available to individuals pursuing academic careers; greater administrative demands associated with an academic research career; a reduction in funding available for research; the demands that an academic research career places on work–life balance; and

the lack of well-trained and well-supported mentors in academia.

## The Need for Research Mentoring

In response to these problematic trends, NIH and the Institute of Medicine (IOM) have identified research mentoring as critically important to increase the capacity and number of clinical and translational researchers and to enhance scientific productivity. Satisfaction with the availability and perceived quality of mentoring has been linked to key mentee outcomes such as career commitment and satisfaction, confidence in research skills, success in grant acquisition and dissemination efforts, and subsequent provision of mentoring.<sup>4–8</sup> Although mentoring is a critical component of career development in the academic health sciences, particularly for individuals committed to translational research, mentoring skills rarely are

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taught explicitly. As with other important skills such as personnel management, financial planning and analysis, team building, and conflict management, mentoring is necessary for a successful career in clinical and translational research. However, mentoring is often given a low priority when other demands are pressing.<sup>9</sup> Furthermore, structural and financial support for mentoring, such as that provided by NIH K24 awards, must be expanded to meet the resource needs of midcareer and senior faculty interested and qualified to mentor a desired growing pool of early-career scientists.<sup>10</sup>

A robust translational research enterprise relies on a strong mentoring program that focuses on faculty recruitment, development of an independent and successful research program, career advancement, retention, and enterprise-wide networking with appropriate mentoring. For the UCSF research enterprise to thrive, it is essential that those of us who are involved in that enterprise train and support midlevel faculty mentors who will guide the next generation of clinical and translational scientists.

#### Stakeholder issues

There is a significant risk to science and society if the current trend continues in which decreasing numbers of talented scientists pursue careers in academic research.<sup>2,11</sup> Stakeholders of high-quality mentoring include trainees, early-career faculty, experienced mentors, potential future mentors, department heads, and university leadership, all of whom benefit from successful academic researchers and programs. A broader tier of stakeholders includes patients, health care providers, public health professionals, and public policy advocates who benefit from the scientific discoveries and enhanced productivity of clinical and translational researchers. Effective mentoring is critical to help early-career investigators become successful, independent investigators and to meet the needs of these stakeholders. Mentors are needed to increase the probability that early-career CTR investigators achieve academic research success. This requires protected time for mentoring, availability of qualified mentors, and the efficient use of resources to support research infrastructure and sustained scientific productivity.

#### Possible solutions

The UCSF MDP was established within a context of structural change designed to increase the pool of scientists conducting high-quality research. Such approaches include the increased focus of the NIH on new and early-career investigators through the use of such resources as K-award funding, loan repayment awards, priority reviews for new and early-career investigators, and the establishment of funding for midcareer clinician investigators to provide mentoring through the K24 mechanism. Individual institutions have implemented programs to increase research involvement, such as expanded research training in professional programs in nursing, medicine, pharmacy, and dentistry, greater access to start-up funding to develop laboratory infrastructure and pilot studies, protected time from clinical care and administrative duties to develop and sustain innovative research, and administrative support for research endeavors.<sup>12,13</sup> Although these programs provide support for mentoring, they do not emphasize formal training for potential mentors.

Of particular importance in the UCSF approach to supporting CTR scientists was the priority of increasing the number and caliber of research mentors. This is the focus of the MDP, and accomplishing this goal can facilitate the development and implementation of the other solutions outlined above.

#### Why the MDP?

The program builds on the improved climate for career support catalyzed in part by the campus-wide UCSF Faculty Mentoring Program (FMP) launched in early 2006. The UCSF FMP is a campus-wide program aimed at improving the availability and quality of mentoring for faculty in all four professional schools at UCSF. This program was established in response to results from a faculty survey that found widespread discontent with the availability and quality of mentoring at UCSF. As part of this shift toward more formal recognition and implementation of mentoring, UCSF now formally recognizes mentoring as equivalent to teaching in the promotion and advancement processes and thereby encourages mentoring activities to be detailed in faculty CVs. Furthermore, the UCSF FMP sponsors an annual award for Lifetime Achievement in Mentoring that

recognizes excellence in mentoring and further aims to increase the visibility and value of effective mentoring role models.

The MDP was established to address the need for systematic training in knowledge and skills central to mentoring. Its primary goal is to train midcareer and early senior clinical and translational research faculty in the knowledge and art of mentoring. Although UCSF has many dedicated, high-quality research mentors, before the MDP there was no formal training program to standardize mentor development. Development of such an approach was a logical solution to address the problems associated with recruiting and retaining new talent in CTR. This approach attempts to compile, align, and share mentoring resources, experience, and skills in a systematic manner that is replicable and amenable to evaluation.

#### Program Implementation

As of this writing (late 2009), the MDP has graduated its third cohort, with 43 midcareer investigators having completed the program. Eligibility was designed to recruit midlevel or early senior faculty members with dedicated research time and expertise in a CTR scientific area. Successful applicants state a desire to be a lead mentor (see List 1) for one to three early-career faculty members and to commit to attending monthly morning meetings over a five-month period. Applicant statements include a description of immediate and long-term career objectives in mentoring early-career investigators, a summary of the applicant's research career, and a description of any prior experience as a mentor. A letter of support from the applicant's department chair is required that describes the applicant's role in the department or school, the benefits the applicant would derive from participation in the MDP, and a guarantee of release time for one morning per month for five months. The MDP leadership team reviews the applications and selects those most appropriate for the program. Enrollment is limited to 15 trainees per cohort. An effort was made to promote diversity among the MDP faculty and trainees with particular outreach to encourage involvement from faculty at all four professional schools at UCSF.

The MDP content and format are based on literature reviews, faculty surveys, and

List 1

**Definitions of Types of Mentors in the University of California, San Francisco Mentor Development Program, 2010**

*Lead Mentor*

- Assumes overall responsibility for guiding and supporting the development of independent research careers of their mentees
- Is an expert in the scientific and/or methodological area that the mentee has chosen to pursue
- Is familiar with faculty, resources and databases within and outside of their discipline
- Has resources that may include research staff that can facilitate the mentee’s research
- Provides guidance about didactic coursework and training opportunities
- Helps identify potential collaborators and builds a mentoring team
- Assures that projects are progressing in a timely fashion
- Assists with development of grant applications and securing funding for projects
- Provides advice about career direction, academic promotion, navigating institutional challenges and barriers
- Facilitates networking on a local, national, and international level

*Co-Mentor*

- Is responsible for working with the lead mentor on overall mentoring responsibilities as outlined above for the mentee
- Provides particular guidance in their areas of expertise

*Research Mentor/Advisor*

- Serves a more limited role than a lead or co-mentor with possibly less resource sharing and often for set periods of time
- May provide guidance in many areas outlined for a lead mentor or co-mentor but most often to a lesser degree. (Examples: supervision of a summer research project, a 1-year commitment of research supervision, assistance with writing of paper(s), and/or research/grant review)
- Usually arranges meetings on an as-needed basis

*Career Mentor*

- Is a senior faculty member responsible for providing career guidance and support for their junior faculty mentees
- May not be intimately familiar with the mentees research interests
- Is responsible for providing guidance about advancement and promotion
- Is expected to meet with the mentee at least every 6 months to review overall career goals and advise on issues related to advancement and promotion
- Ideally should not be a mentee’s direct supervisor but will almost always be in the same home department

input from senior, experienced mentors at UCSF. Identified barriers to developing a successful research program were consistent with those reviewed in the literature and included competing administrative and clinical demands and the high level of competition for research funding. The resulting curriculum consists of 10 case-based seminars designed to stimulate discussion about mentoring best practices (see List 2). Experts from within the university, including the associate deans for academic affairs from each of the four professional schools, were invited to participate in the development and implementation of the MDP. The

involvement of the academic deans helped to reinforce the role of research mentoring at the institution, which is conceptualized as equivalent to teaching in the promotions and appointments processes. The monthly schedule includes two seminars each morning and time for mentors in training (MITs) to network with each other and with senior mentors. An MDP Wiki site was developed that includes mentoring resources, seminar outlines, illustrative mentoring cases, and the opportunity to add observations and comments to the mentoring cases. Seminars are recorded and available for viewing on DVDs, creating an online resource for the entire UCSF community.

The MDP curriculum includes topics selected to enhance two types of support that have been identified as important in mentoring: instrumental and psychosocial support.<sup>14</sup> As suggested by the labels, these indicate (1) practical and informational guidance and (2) emotional, role modeling, and empathizing types of support. Although the ultimate goal of the sessions is to provide knowledge and skills for mentoring, the content has the added benefit of directly enhancing the mentors’ research programs through improved understanding of institutional policies and access to resources that strengthen the mentors’ programs as well as the careers of the early-career investigators whom they mentor. Each session uses a range of formats and techniques, including panel discussions with senior mentors and high-level academic personnel, illustrative case discussions that highlight topics pertinent to mentoring, and experiential exercises to facilitate discussion, skills development, and networking. Below is a sample of one of these case discussions.

Sample Case

D.T. is a junior faculty member who joined the faculty three years ago after completing a research fellowship. Her research mentor helped her obtain a supplemental grant on another mentor’s R01 in her first year after appointment and advised her on applying for various other mentored awards. D.T. received the supplement, which funds a large portion of her salary. About a year after getting the supplement D.T. announced to her mentor that she is not sure she is cut out to do research and that she doesn’t really enjoy this aspect of academic medicine. She thinks that what she really wants to do is be “an educator,” but since she has the supplement for about three years she will “see how things go” and decide about her career path in academic medicine when the supplement is nearing the end.

Questions for discussion:

1. As D.T.’s mentor, how do you *feel* about her decision? What emotions come up for you?
2. What is the “differential diagnosis” of what may have prompted D.T.’s change of heart?
3. What are the communication challenges in this mentor–mentee relationship?
4. What resources can the mentor draw on to help mentees who are struggling?



## List 2

**Topics and Objectives of the University of California, San Francisco Mentor Development Program, 2009**

- Session 1. *Defining Mentorship From the Beginning*  
Objective: To define the mentoring team concept, and the related roles and expectations
- Session 2. *Rewards and Challenges of Mentoring*  
Objective: To identify rewards related to motivating early-career researchers and to contextualize the challenges associated with committing to mentoring
- Session 3. *Communicating Effectively With Mentees*  
Objective: To understand and practice the essential elements of effective communication, including active listening and to apply these concepts to specific communication challenges in the mentor-mentee relationship
- Session 4. *Balancing Work and Life*  
Objective: To share personal stories of work-life challenges and discuss successful (and unsuccessful) approaches toward dealing with these issues. Campus resources for maintaining a successful work-life balance are presented
- Session 5. *Understanding Diversity Among Mentees*  
Objective: To increase appreciation of the importance of diversity and its impact on the mentoring climate
- Session 6. *Understanding Academic Advancement Policies*  
Objective: To provide resources that will help mentors and mentees understand the academic merit and promotion processes, to provide information that will assist mentors as they advise mentees about selection of appropriate faculty/academic series, and to train mentors to advise and assist mentees in preparation for promotion (across a variety of faculty/academic series)
- Session 7. *Understanding Economic and Fiscal Realities for Successful Academic Careers*  
Objective: To provide tools to the mentor including information on how to read fiscal data, how often to expect updates, how to stay ahead of spending problems, how to identify problems, how to build funds for future use, and how to apply and teach these tools to mentees
- Session 8. *Leadership Skills and Opportunities: How to Build a Successful Research Team*  
Objective: To provide information to the mentor to improve leadership skills that he or she can then pass on to mentees
- Session 9. *Understanding Intramural and Extramural Grants*  
Objective: To provide resources about grants (NIH, foundations, industry, intramural, etc.), an in-depth understanding of mentored/mentoring funding mechanisms including K24 Mid-Career Grants and Mentored K Grants (K01, K08, K23, K12)
- Session 10. *IRB: Navigating the UCSF Application Process, and Wrap up*  
Objective: To increase mentors' familiarity and facility with IRB processes and to encourage feedback on the MDP program

In session 1 (for example), there is a strong emphasis placed on defining mentoring and distinguishing between different types and levels of mentoring (see List 1). Also, throughout the sessions, there is reference to the use of an individual development plan (IDP); the form that is used to create that plan is shown in Appendix 1 (<http://links.lww.com/ACADMED/A9>). The IDP serves as an agreement or contract between the mentor and mentee to assist in setting goals for the mentee, a vehicle for clarifying expectations for the mentor and mentee, and a means to identify problems and monitor progress. The MDP curriculum materials are available at <http://ctsi.ucsf.edu/training/mdp-materials>.

There are a number of challenges with implementing the MDP. First, there is a need for high levels of coordination and direction to align the resources from the various components. In this case, although there are rich resources and talented mentors in all four professional schools at UCSF, it takes effort to bring them together. To support these efforts, the UCSF CTSI provides resources and funding to administer the program. Conference calls were conducted regularly in the planning and implementation stages of the MDP to facilitate the cross-disciplinary coordination that makes the UCSF MDP unique. Second, the MITs must commit a substantial amount of time to the program, which is challenging, given

competing clinical, administrative, and research demands. Gaining the support and buy-in of department heads is paramount to overcoming this obstacle. The support from these administrative heads is facilitated through the endorsement of the program by the CTSI and the academic deans. In addition, applicants to the MDP must commit to the scheduled meetings as a condition of their application. Trainees must attend all sessions to be awarded the certificate of completion from the program. Third, monitoring outcomes is challenging when some of the expected results occur over a period of years. Systems must be in place to capture these outcomes over time to document the successes of the program and to justify its ongoing presence. With the commitment and support from the CTSI, the UCSF MDP has dedicated staff who maintain a database of subsequent indicators of program success, including funded K24 and mentored K awards, number of mentees and specific mentoring roles of MDP graduates, and other metrics described below. Finally, the use of an online Wiki space to facilitate interaction between trainers and trainees between sessions took some persistence on the part of the MDP faculty. To overcome resistance to the Wiki, MITs and trainers were often encouraged to add specific ideas and comments to the Wiki. Furthermore, using a Wiki allowed for the implementation of a no-paper rule, in which no handouts were provided in sessions and participants were responsible for accessing all materials on the Wiki before sessions. Once the MITs became oriented with this innovative tool for organizing a dynamic curriculum, the barriers were overshadowed by the benefits of using the online space, in which thousands of pages of sample grant proposals, articles, sample recommendation letters, and other mentoring resources can be accessed.

**Program Comparisons**

Although there are existing programs for increasing mentoring in academic research,<sup>15</sup> the MDP is unique in that it includes a formal mentor-development emphasis. A comparable program is one developed at the Cleveland Clinic, in which mentors are exposed to a range of topics relevant to effective mentoring.<sup>16</sup> Other investigators have identified the importance of aligning mentor and

mentee expectations,<sup>17</sup> but the development of formal training programs for mentoring remains lacking.

The MDP at UCSF is unique in the following ways. First, it is positioned within a larger mission of increasing the availability and quality of faculty mentoring. Second, it is specifically designed to address the unique needs of mentors and mentees conducting clinical and translational research. Third, it spans the four schools of the university, pooling expertise and resources from nursing, medicine, pharmacy, and dentistry. Fourth, the case-based curriculum allows participants to tailor the content with highly relevant vignettes. Fifth, the MDP was designed to maximize the identification and utilization of mentoring resources, thereby leveraging and building on existing infrastructures. Finally, the use of the Wiki as an online, interactive medium to share resources within and beyond the MDP group participants and trainers adds innovation to the program, catalyzes modifications to the curriculum, and enhances access to the program.

### Program Assessment

The UCSF MDP was designed to document specific components of its success. These include both short-term and long-term metrics. Quantitative short-term measurements being captured include:

- Number of prospective mentors applying, selected, enrolled in the program, and completing their mentoring training
- Number and profile of recruited mentors (e.g., disciplines, schools, academic position, length of time in academic position)
- Skill level at baseline assessing active mentors' experience, levels of comfort, and levels of knowledge. For example, these individuals' career advancement issues and, at six months, their assessments regarding self-perceived changes in their roles as mentors as a result of training
- Number of mentees for each mentor enrolled in the program
- Number of abstracts, grants, and manuscripts that the mentors' mentees completed

Longer-term measurement/benchmarks of the MDP include:

- Successful yearly recruitment and retention of mentors who are members of underrepresented minority groups, women, and other special groups
- Academic senate promotion packages that recognize mentoring as a key and that meet professional promotion criteria and activity
- Journal publication of the CTSA MDP's concepts and outcomes
- Number of successful K24 Mid-Career awards for trained mentors
- Independent funding for the MDP

An evaluation of the first two cohorts of MITs to complete the MDP found that most reported that the program increased their mentoring skills and confidence.<sup>18</sup>

### Program Sustainability

The MDP curriculum and philosophy aim simultaneously to (1) provide a structured, systematic presentation of information and skills to increase the pool of qualified mentors in CTR and (2) be adaptive to feedback from participants and changes in the CTR environment. The initial efforts to develop and implement the MDP are expected to pay off through the outcomes described above. The use of online resources and recorded sessions are important aspects of the program that increase the accessibility of the program materials. The program is regenerative in that it invites participants who complete the program to become facilitators in future cycles of the training curriculum, which creates a steady influx of trained mentors to carry on the tradition of mentor training. The true test of the sustainability of the MDP will be evidenced by continued funding, which, in turn, is linked to documenting worthwhile outcomes over time.

### Meeting a Growing Need

The MDP at UCSF was developed to meet the growing needs of mentoring in clinical and translational research. The program objectives were crafted to specifically map onto existing barriers to mentoring, which were identified in the

literature and through surveys of existing faculty. The curriculum includes a combination of skills-based experiential exercises, case discussions, and specific information related to fiscal and personnel management, IRB procedures, and grant resources. Ongoing evaluation of the program will document its success toward the primary aim of increasing the pool of effective clinical and translational research mentors at UCSF, thereby attracting and retaining talented early-career professionals dedicated to careers in research.

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## Did You Know?

In 2003 at the Weill Medical College of Cornell University, patients received the first-ever gene therapy for Parkinson disease.

For other important milestones in medical knowledge and practice credited to academic medical centers, visit the “Discoveries and Innovations in Patient Care and Research Database” at [www.aamc.org/innovations](http://www.aamc.org/innovations).