

# Mentoring the Next Generation of HIV Prevention Researchers

## *A Model Mentoring Program at the University of California San Francisco and Gladstone Institute of Immunology and Virology Center for AIDS Research*

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**Purpose:** Mentoring is critical to develop and nurture early career investigators, helping them to succeed in building networks of colleagues, and is especially important for investigators focused on HIV research. We piloted a multidiscipline mentoring program targeting postdoctoral scholars and early career faculty concentrating on HIV/AIDS research.

**Method:** The pilot mentoring program was conducted at the Center for AIDS Research (CFAR) at the University of California San Francisco and the Gladstone Institute of Virology and Immunology. Mentees were self-referred postdoctoral scholars and early career faculty. Mentors were drawn from the senior faculty. Early career mentees were matched with senior investigators for individual meetings, a monthly workshop on topics directed by the mentees, and single-day mentoring seminars.

**Results:** More than 30 mentees and 20 mentors have participated in the pilot project. Most mentees reported that the 1-on-1 mentoring was a satisfying experience. The most highly valued activities were those that facilitated networking among mentees, networking between mentors and mentees, and workshops that focused on grant applications and first academic appointments and promotions.

**Conclusions:** A multidisciplinary mentoring program for postdoctoral scholars and early career faculty focused on HIV/AIDS research is valuable. Umbrella organizations, such as the CFAR, are well suited to create and provide highly valued mentoring experiences.

**Key Words:** HIV, mentoring, program development

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Developing new investigators dedicated to HIV research is a critical task for continued scientific progress to stem the tide of the HIV/AIDS epidemic. Scientific progress in HIV and other areas is increasingly based on teams of investigators from different disciplines working at the intersections of their fields.<sup>1,2</sup> Epidemiologists and clinicians documented the emergence of the pandemic by defining the disease and risk factors and by providing prognostic information for disease progression. Basic scientists working with clinicians identified the virus, the critical function of many viral proteins, the genetic variations of the virus, and the innate immune response to infection. Clinical, behavioral, and translational research led to the approval of 21 antiretroviral medications that have changed the impact of HIV infection by substantially reducing HIV mortality and disease progression in settings where these treatments are available and appropriately used. Research conducted internationally and associated operational activities are transforming the clinical battle against HIV in developing countries. The scientific accomplishments of the past 26 years that span the HIV epidemic are truly spectacular; however, a key question that remains is how can we recruit, train, and help to establish the next generation of scientists needed to continue to address the HIV epidemic. This is a critical question, because effective control of the epidemic requires ever more intensive collaborations among behavioral, epidemiologic, systems, clinical, and basic science investigators. To further the mission of training, educating, and networking the next generation of HIV scientists, the Center for AIDS Research (CFAR) in San Francisco created a novel mentoring program for early career investigators committed to a career in HIV research.

Mentoring is now recognized as a key factor for work satisfaction, productivity, and retention of medical researchers in academic settings.<sup>3–9</sup> Successful academic investigators often cite a particularly meaningful mentoring relationship, usually established at a critical point in their career, as a major determinant of their own career outcome.<sup>10–13</sup> Mentoring is a crucial intervention to help recruit faculty into priority work and in supporting the diversity necessary to develop medical research programs that are responsive to and well received by faculty and the public.<sup>11,14</sup> The importance of traditional 1-on-1

mentoring is a central activity; yet, the specific strategies and methodologies for providing this are not well documented, and the outcome of these experiences are largely dependent on lucky pairings of well-suited mentors and mentees. To fill this gap and to promote the advancement of and the commitment to the next generation of HIV investigators, the San Francisco CFAR developed a mentoring model to augment the existing mentoring activities for individuals beginning careers focused on HIV research.

## METHODS

The University of California San Francisco (UCSF)–Gladstone Institute of Virology and Immunology (GIVI) CFAR Mentoring Program is modeled on local and national consensus panels and statements that elucidate the essential methodologic components of optimal mentoring. The programs of highest value included the following: *Advisor Teacher Mentor Friend. On Being a Mentor to Students in Science and Technology*,<sup>15</sup> *The UCSF Postdoc Mentoring Program: Guidelines for Faculty Mentors*,<sup>16</sup> *The UCSF Graduate Student Mentoring Program: Guidelines for Faculty Mentors*,<sup>17</sup> the Gladstone Institute's *Postdoctoral Fellows Program Mentoring Standards*,<sup>18</sup> *A Guide to Training and Mentoring at the Intramural Research Program*,<sup>19</sup> and *The Climate for Faculty Report of the Chancellor's Task Force on the Climate for Faculty*.<sup>20</sup>

Several points were considered, including who would be mentored, who would serve as mentors, the matching method between mentors and mentees, the voluntary nature of the program, and the evaluation methods. Three primary activities were identified as the cornerstones of the project: individual meetings between matched mentees and mentors, a monthly workshop series for mentees that would also be open to the campus, and a mentee orientation to the UCSF-GIVI CFAR enterprise.

The following definitions are used in the mentoring program model:

**Mentee:** an individual engaged in the development of a set of knowledge and skills whose professional satisfaction would benefit from a relationship with a senior faculty member at the institution

**Mentor:** a senior faculty member engaged in the development of a set of knowledge and skills who takes an interest in helping another person to develop into a successful professional

**Mentoring:** a process supported by the CFAR to encourage the sharing of intellectual, experiential, and life experience resources to facilitate individual development and professional satisfaction for mentees and mentors

### Identification of Mentees

Mentees were identified by self-referral and by faculty referrals. E-mail solicitations were sent by means of a large CFAR list to increase awareness of the pilot program and encourage participation.

### Identification of Mentors

Mentors were chosen from the CFAR senior faculty with proven records of academic accomplishments and with an interest in participating in a pilot mentoring project.

## Matching Mentees and Mentors

In the first year of the program, the mentoring codirectors (JK and RG) paired each mentee with 2 mentors using the following guidelines: (1) mentors must not be current members of the mentee's research unit, (2) at least 1 female mentor for each female mentee, and (3) at least 1 mentor from outside the mentee's main field of research. In the second year of the program, using feedback from the first year's mentees, a different approach was taken to matching. At the onset of the second year of the mentoring program, mentees were invited to review the CFAR mentor Web site and the mentors' profiles and then to rank 3 mentors in preferential order. Mentees' preferences were reviewed, and pairings were assigned based on the following priorities: (1) retaining the prior year's pairing for continuing mentees, (2) matching the mentee with his or her highest ranked mentor, (3) matching a female mentee with a female mentor, and (4) matching a mentee with a mentor who would augment his or her mentoring experience. The entire program and each workshop were evaluated using a multiple-choice questionnaire designed by 2 of the authors (LD and SFB) with optional fill-ins, framed according to previously published guidelines.<sup>21</sup>

## RESULTS

In the first year of the UCSF-GIVI CFAR Mentoring Program, 12 mentees were matched in a 1-to-1 ratio with a total of 21 different mentors (Table 1). In the second year of the program, 20 mentees (14 new and 6 continuing mentees) were matched in a 1-to-1 ratio with 22 mentors (2 mentees were each paired with 2 mentors). In the first year of the program, there were more female mentees (N = 7) than male mentees (N = 5). In the second year, there were again more female mentees (N = 12) than male mentees (N = 8). In the first year of the program, most mentees had an MD degree (N = 10), whereas in the second year of the mentoring program, the numbers of mentees with PhD degrees increased substantially (N = 10). In both years of the program, the mentees were at beginning stages of their career, usually at the postdoctoral scholar level (45% and 35% in years 1 and 2, respectively) or assistant professor level (45% and 55% in years 1 and 2, respectively). The same mentors participated in the first and second years of the program, with the addition of 1 man in clinical science and 1 woman in behavioral science. One mentor from the first year decided not to participate in the second year, citing commitments to other projects. Among the 22 mentors in the second year of the program, 11 are women and 11 are men. More than two thirds of the mentors are professors at UCSF.

A key aspect of the mentoring program is the expectation that each mentee would meet with his or her mentor at least once every 2 months. Because there were 2 mentors for each mentee, it was anticipated that each mentee would have a monthly meeting with a mentor. This did not happen. Only 4 mentee-mentor pairs met monthly; the other pairings met less frequently, and 6 pairs met only every 6 months. Interestingly, the most common cited explanations for infrequent meetings were mentee preference and that the mentee was too busy with other activities. Few mentees

**TABLE 1.** Demographics of the UCSF-GIVI CFAR Mentees

	2004 to 2005	2005 to 2006
Total	N = 12	N = 20
Gender (female/male ratio)	7:5	12:8
Age (y)	36	36
Doctoral degree(s)		
PhD	1	9
MD	10	9
MD, PhD	1	1
Pharm D	0	1
Academic position at UCSF-GIVI CFAR		
Postdoctoral scholars	6 (50%)	7 (35%)
Assistant professors	5 (42%)	6 (30%)
Assistant adjunct professors	0	5 (25%)
Resident scientists	1 (8%)	1 (5%)
Clinical instructor	0	1 (5%)
Primary work site		
UCSF or San Francisco General Hospital	6 (50%)	15 (75%)
GIVI	4 (33%)	3 (15%)
San Francisco Department of Public Health	2 (17%)	2 (10%)
Primary area of academic activity		
Basic science or basic/clinical interface	4 (33%)	6 (30%)
Clinical/translational or clinical/behavioral interface	6 (50%)	12 (60%)
Behavioral science	2 (17%)	2 (10%)

identified a lack of administrative support or a lack of mentor responsiveness as a factor that prevented frequent meetings with their assigned mentors. Meetings were evenly divided between the office or laboratory and off-site venues. In general, most mentees were satisfied with the selection of their mentors, and most found it beneficial to have a nonsupervising mentor. Some mentees also highly rated the benefit of having a mentor from their field, however; perhaps reflecting a shortcoming in their primary research setting or a personal preference for more focus. Considering this, in the second year of

the program, mentors were assigned based on the mentees' preferences for mentors. As a result, 12 mentees received their first choice, 5 received their second choice, 2 received their third choice, and 2 received an alternative choice for their mentor.

At the start of the second year of the mentoring program, the mentees were asked to rank the mentoring workshops they believed to be of greatest value. The ranking confirmed that mentees were mostly interested in a program that would help them to network and expand their collaborations (Table 2). The mentees placed high value on activities associated with understanding National Institutes of Health (NIH) funding, grant submission, and first academic appointments. Interestingly, and somewhat unexpectedly, workshops focusing on life and work balance issues were not identified as of high value to the mentees. When asked how the first year's workshop series provided benefit, the mentees gave the highest values to "Provided career-related skill-building tips," "Increased my interaction with colleagues," and "Revealed sources of institutional support."

**DISCUSSION**

This program was unique in several respects. First, to our knowledge, it is the first programmatic approach directed to postdoctoral scholars and early career faculty seeking to establish a career in HIV/AIDS research. Second, this program involves mentees and mentors who were organized around the general theme of HIV/AIDS research but specifically focused on 3 major academic areas: basic, clinical, and behavior research. The intersections of basic, clinical, and behavioral research represent key areas for this CFAR. Third, the program facilitated networking by matching mentees with senior faculty mentors who were not their direct supervisor but who could augment the junior investigators' professional experiences. Finally, this program utilized frequent workshops with themes that the mentees identified as important. Evaluation results demonstrated that, overall, the program was rated valuable to the mentees, which led to the decision to continue

**TABLE 2.** Areas of Interest Leading to Mentee-Directed Workshops at the UCSF-GIVI CFAR

Workshops	Percent of Mentees Ranking the Workshops			
	Extremely or Very Useful	Neutral	Not as or Not Useful	Not Ranked
Networking and expanding collaborations	80%	10%	0	10%
NIH funding and peer review	75%	5%	5%	15%
Embarking on international research	55%	20%	0	25%
First appointments and promotions	55%	25%	5%	15%
Submitting your first R01	50%	15%	10%	25%
Ethics of HIV research	45%	30%	5%	20%
Managing a laboratory or program	45%	30%	0	25%
Resolving academic conflicts	45%	25%	5%	25%
Industry and academic research careers	40%	15%	15%	30%
Review process for journals	40%	20%	15%	25%
Submitting a first UCSF grant	40%	15%	20%	25%
Life and work balance issues	35%	20%	20%	25%
Human subjects research	25%	40%	10%	25%

the program with some modifications. Programmatic changes between the first and second years were aimed at reducing perceived burdens among the mentees and mentors (excessive meetings were eliminated), and mentees were encouraged to rank their choice of mentors to influence the assignment of mentor-mentee pairings.

The mentoring program was presented to prospective mentees and to the mentors as a pilot program. Key to the effort was the recognition that this new program was not designed to replace the ongoing traditional mentoring that is part of the culture at UCSF and GIVI. The CFAR program was designed to enhance existing informal mentoring by providing a structured opportunity for senior and junior investigators, who typically would not interact, to establish personal connections. It was hoped that the nonsupervising mentor would provide an avenue for the mentee to explore issues not easily raised with a direct supervisor. Although the individual 1-on-1 meetings did not occur as often as initially designed, the networking that developed was perceived as satisfying and filled a need for the mentees.

The pilot mentoring program was developed to provide added value to the mentees through mentee-mentor meetings, workshops, and the general orientation to the research enterprise at the CFAR. The program directors worked closely with the mentees and mentors to identify challenges and engage in problem solving with mentees and mentors. The mentees and mentors were paired to maximize the range of experiences for both, to facilitate new collaborative work, and to reduce the potential risk of perceived conflict that might develop between mentees' direct supervisors and the CFAR mentors. Despite these attempts, 5 mentees left the program after the first year. Two mentees left for reasons not associated with the program: 1 because she recognized that she was not interested in a career focused on HIV research and the other because she successfully competed for a career development award overseas. In fact, both of these cases may represent success of the mentoring program in that it helped a mentee to identify a career path with higher level of personal satisfaction and it helped another mentee to obtain a career award in HIV research at another center. The 3 mentees who chose not to continue in the program because of insufficient time probably failed to obtain value from the pilot program, however.

The addition of 15 new mentees in the second year of the program surprised us. Although the first year of the program was highly rated, we considered that persons eligible to participate in the second year might be disinclined to sign up and participate because of a lack of time or perceived lack of value. The increase in the number of new mentees may reflect that first-year mentees who received the greatest value may have been more likely to inform their peers of the program than were persons who opted to discontinue the program. The option of selecting mentors may also have helped to draw in new mentees. In addition, the second year may have benefited from better outreach or better targeting of persons eligible to participate. Another reason for the increase in the number of mentees in the second year is that mentees were allowed to participate in the selection of their mentors. This greater "buy-in" may have contributed to a greater sense of value to the new mentees. In addition, coinciding with the second year of

the program, the CFAR's new focus on international clinical research may have attracted more persons focused on international research, an area for intense mentoring. Finally, the mentees are geographically dispersed, working at more than 6 major sites in San Francisco. The geographic dispersion is a key issue that contributes to being disconnected from the diverse research enterprise in San Francisco and results in networking obstacles for early career faculty and postdoctoral scholars. The opportunity to establish unique connections with researchers and to overcome the problems associated with geographic dispersion may represent the greatest value of this pilot program and explain why 15 new mentees decided to participate in this project.

It is interesting to note that mentees perceived their own schedules as the limiting factor for meeting with mentors. It is surprising that mentees would fail to prioritize a meeting with a senior faculty member outside the mentee's area of expertise. This may indicate that the mentees were simply not engaged in the mentoring relationship or that they did not receive any added value to the relationship with a senior nonsupervising faculty member. It was this possibility that led us to change the second year's mentoring activity so that mentees could participate in the selection of their mentor; hence, giving them an added stake in the program and the resulting mentoring relationship. At the end of the second year, we plan to analyze whether the mentees who received their highest ranked mentors found the greatest value in the mentoring relationship.

It is important to note that all but 1 of the mentors from the first year of the program continued in the second year. Although we did not include them in the evaluation of the pilot project, it was gratifying that virtually all the mentors remained in the program in the second year. The mentors' sustained commitment suggests that mentoring is relevant and rewarding for the senior faculty. In the second year, we plan to develop and analyze the program from the mentors' perspective.

Defining the outcomes for successful mentoring is difficult. Such tangible outcomes as publications, peer-reviewed grants, and faculty promotions take years to achieve. Definitive assessment of the effect of any mentoring intervention on career outcome is technically problematic; randomization, even to a usual care program compared with an experimental program, is likely to be poorly accepted. In addition, there are multiple factors that influence the distal outcomes, thus making such impractical. The long incubation period needed to assess mentoring success and the difficulty with assigning specific attribution to mentoring activities may discourage the establishment of mentoring programs. In addition, mentoring is expensive. Not only are there costs associated with program development and maintenance but there are costs associated with the time and effort for the mentors and the mentees. Structured programmatic mentoring is still relatively new, and compensatory funding for mentoring activities is rare. Nevertheless, mentoring is perceived and reported by many successful investigators to be a valuable activity and crucial for academic advancement. The CFAR, a bridging resource to support HIV/AIDS research, represents an ideal mechanism to support an HIV/AIDS-specific mentoring program.

Mentoring is a cornerstone activity among medical scientists throughout their careers. The formal mentoring between a laboratory or clinic director and an early career faculty member or postdoctoral scholar is often the difference between career success and satisfaction or career disruption and dissatisfaction for the junior member. The task of sustaining progress in understanding the AIDS epidemic and HIV disease pathogenesis, and the basic biology of HIV, is soon going to fall to the next generation of scientists. The development and testing of specific mentoring methods and structured mentor program components should contribute to the growth of new investigators and prevent the potentially enormous costs of failed research careers. When the costs of attrition, suboptimal productivity, and problematic interactions are considered, a mentoring program with proven methods may be the most cost-effective intervention to create and sustain the next generation of investigators. Although the CFAR pilot mentoring program is a work in progress and continues to be refined and evaluated, it provides an excellent model for senior faculty who are committed to nurturing the next generation of HIV/AIDS scientists.

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