EXPANDING RESEARCH OPPORTUNITIES: A PARTNERSHIP GUIDE

REPORT OF THE WORKSHOP

BUILDING COLLABORATIVE PARTNERSHIPS BETWEEN MINORITY AND NONMINORITY INSTITUTIONS

SEPTEMBER 20-21, 1996

HOUSTON, TEXAS

OCTOBER 1997

Foreword

It is my pleasure to present this guide on building collaborative research training partnerships between research-intensive and minority-serving academic institutions. Research training in the biomedical and behavioral sciences is a high priority for the National Heart, Lung, and Blood Institute (NHLBI), which offers a wide range of programs to support research training and career development at all stages.

For many years, the NHLBI and the National Institutes of Health (NIH) as a whole have been particularly concerned with increasing the participation of minority individuals in biomedical and behavioral research careers. Collaborative partnerships between research-intensive and minority-serving institutions present a strategic approach for achieving this goal. However, creating a satisfactory working relationship between different types of institutions has its challenges, and to date there have been few sources of guidance on the practical issues of setting up and implementing such a partnership.

To learn more about challenges and successful strategies in partnership building, the NHLBI, in collaboration with the NIH Office of Research on Minority Health, sponsored a September 1996 workshop in Houston, Texas. The workshop brought together faculty, staff, and administrators from numerous research-intensive and minority-serving institutions in Texas and surrounding states. This guide is the result of their discussions.

In presenting this guide, we thank the University of Texas Medical Branch at Galveston for serving as Texas host of this workshop and extend our deep appreciation to the participants for their contributions to the workshop and to the development of this guide.

Claude Lenfant, M.D.
Director
National Heart, Lung,
and Blood Institute

Table of Contents

Introduction

Collaborative research training partnerships between research-intensive and minority-serving colleges and universities are emerging as an innovative way to boost minority recruitment and retention in the biomedical and behavioral sciences, stretch limited educational and research resources, and enhance the research opportunities available to all students and faculty.

Many such partnerships already exist in one form or another, and more are in the planning stages. Some have been extremely successful, providing unexpected benefits to both partner institutions well beyond the primary goal of improving minority recruitment, retention, and training. Others, however, have not yielded satisfactory results, or have been abandoned in the early stages due to lack of planning, communication, trust, support, or sustained interest.

Whether you are a faculty member, a department chair, a dean, or a career counselor, your ideas on enhancing biomedical and behavioral research training opportunities for minority trainees can improve the quality of research and teaching for your entire institution.

Background

Academic institutions and the National Institutes of Health (NIH) have worked to improve minority participation in research for the past 20 years. Although representation has increased for some minority groups, the number of minority individuals who attain Ph.D.s and other advanced degrees in biomedical and behavioral sciences has remained disproportionately low with respect to the population at large.

In 1993, the National Heart, Lung, and Blood Institute (NHLBI) convened a Working Group on Minority Recruitment to examine strategies for increasing minority participation in biomedical and behavioral research training. The working group recommended encouragement and support of collaborative research training partnerships between minority-serving institutions and nonminority research-intensive institutions.

Although interest in creating these partnerships was high, confusion over the practical aspects was even higher. Clearly, any workable strategy for building partnerships between different types of institutions would require the input and experience of the researchers and administrators who were expected to build them. Therefore, in September 1996, the NHLBI and the NIH Office of Research on Minority Health convened a workshop in Houston, Texas, to develop partnership-building strategies with the help of faculty, staff, and administrators at all levels from minority-serving and research-intensive academic institutions in the region. This guide was developed based on the discussions at that workshop.

A PRACTICAL GUIDE

Many Federal research agencies and educational and professional science organizations have published guides and reports on academic partnerships. However, few of these guides provide concrete "how-to" advice on planning, coordinating, and funding partnerships; recruiting and retaining minority trainees; designing activities and crucial support functions; or evaluating these programs and tracking the participants. This guide was developed to provide practical strategies, based on the experience of faculty, counselors, and administrators at research-intensive and minority-serving institutions, for putting together an effective collaborative research and training partnership while avoiding common pitfalls.

A collaborative partnership between minority-serving and research-intensive institutions can be initiated at almost any level within a college or university. Moreover, because entire institutions, not just individuals, are the partners, a partnership that is successful will eventually grow to involve faculty and staff at all levels. Therefore, the suggestions in this guide are designed for all of the following potential participants:

- Faculty
- Researchers
- Department chairs
- Deans
- University administrators
- Minority programs officers
- Career counselors
- Provosts
- University presidents.

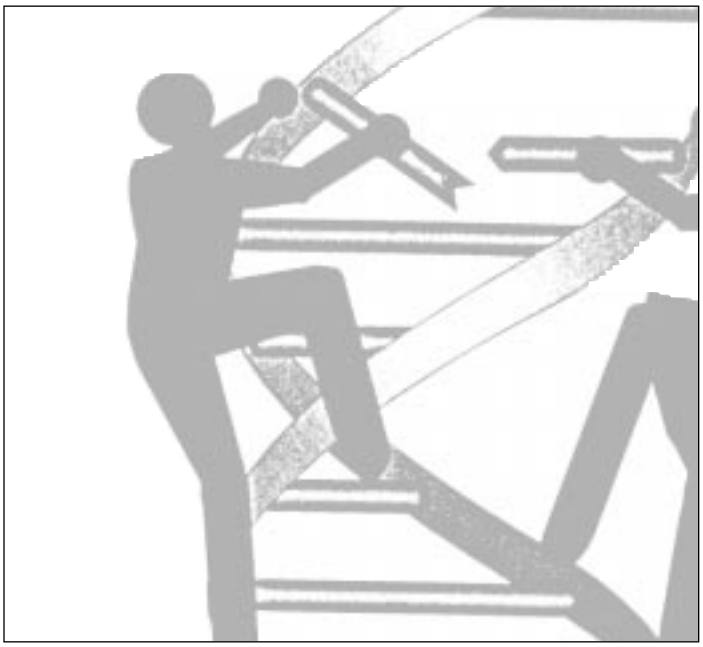
Each collaborative partnership is different. You may not need all the information in this guide to conduct a simple, one-time joint activity. However, a view of the "big picture" can give you new ideas for enhancing your activity's training value or using it as a pilot project and a source of contacts for future programs. In the chapters that follow, you will find a comprehensive but modular approach to partnership building.

Most of the recommendations in each chapter are generic and apply to anyone interested in creating an effective partnership with another institution. However, you will also find specific considerations for different roles as well as for each partner institution. Also, although collaborative partnerships can certainly include more than two partner institutions, for convenience and simplicity this guide refers to "both" rather than "all" partners.

CHAPTER 1

1

The Basics of Partnership



THE BASICS OF PARTNERSHIP

CHAPTER 1

The Basics of Partnership

What is a collaborative partnership? And can it really work for research training?

The focus of this guide is on building collaborative partnerships between research-intensive universities and minority-serving colleges and universities. This combination has great potential for:

- Boosting minority enrollment in graduate research programs
- Improving the quality of minority undergraduate science education
- Creating new opportunities for collaborative and independent research.

But as many planners have found, creating a partnership that will actually produce the much-anticipated and much-needed benefits to both sides is anything but easy. To do that, you need to know:

- What a collaborative research training partnership is
- How to create a workable plan that is well-balanced, tailored to your needs and those of your partner, designed to achieve meaningful goals, and capable of overcoming anticipated barriers
- How to design, maintain, improve, and expand your partnership
- How to determine the effectiveness of each component in your partnership, address problems, and chart progress.

Definitions and Concepts

A collaborative research training partnership is:

> A mutually beneficial relationship in which two or more academic institutions with different resources and research capabilities cooperate as equal educational partners. The purpose of this partnership is to enhance biomedical or behavioral research training opportunities for students, faculty, and postdoctoral individuals and to prepare them for careers as independent researchers. In this relationship each partner institution has equal decision-making power, benefit, ownership, and a certain independence but also an obligation to the other or others.

Overall Goals

These research training partnerships have three major goals:

- To bring more minority individuals into biomedical research and training
- To increase both partners' resources and capabilities for research and training
- To expand the range of research opportunities for students and faculty at both partner institutions by building a network of reliable contacts at several organizational levels.

Research training is *the primary goal*. Partnerships that focus primarily on research projects

often do not balance power and benefit in a way that strengthens both research-intensive and minority-serving institutional partners. These relationships rarely take full advantage of the opportunities for training or for strengthening science curricula. In such cases, the chances of building trust for a satisfactory long-term partnership are diminished.

By starting with research training as the primary goal, collaborative partnerships can achieve all or most of their other goals in a natural progression that builds communication, experience, and trust. Cooperation in training enables faculty and administrators from both institutions to agree on training goals, provide reliable referrals for trainees and mentors, and develop a coordinated training path. Joint development of seminars and targeted programs helps partner institutions identify current gaps in their own curriculum offerings and generate valuable new ideas for training their own students. Visiting students and faculty get to know not only the people in their host laboratories but others in the department with whom they or their colleagues may want to collaborate. Word-of-mouth recommendations increase interest among fellow trainees and faculty to pursue new research opportunities with students and faculty at the partner institution.

Moreover, because formal training activities are governed by existing academic standards at each institution, starting with research training provides a strong incentive for partner institutions to evaluate programs as they go along. Identifying problems early is a key to working out solutions that will achieve their established and mutual training goals. As partner institutions, departments, and coordinators evaluate and refine their activities together, they learn how to work together more effectively. Participants develop skills such as mentoring, grant writing, and negotiation that will help them enter into a larger array of collaborative efforts successfully.

Partners

Two kinds of partners are involved in collaborative research training partnerships: the people who coordinate and plan the partnership and its activities (referred to in this guide as planners or planning partners), and the institutions that conduct the partnership. The institutions included in this guide are defined as follows by the Federal Government:

- *Minority-serving institutions* (MSIs) have more than 50 percent enrollment of Black students or at least 25 percent enrollment of Hispanic students. Minority-serving medical schools are those with at least 10 percent enrollment of students from minority populations. In states such as Texas and New Mexico that have large Hispanic and American Indian populations, many of the state universities and colleges qualify as MSIs although the majority of their total enrollment is white.

  Of these, *traditionally minority institutions* such as Historically Black Colleges and Universities (HBCUs) train primarily minority students. Most of these institutions are undergraduate only, and some (particularly Tribal Colleges) are 2-year or junior colleges that award an associate's degree rather than a baccalaureate. However, some eminent HBCUs have medical, health professional, and graduate schools offering M.D., Ph.D., and other advanced degrees in the biomedical and behavioral sciences. Teaching is a strong focus for these institutions. Most have small science faculties with heavy teaching loads and limited opportunities and facilities for independent research. A significant number of science faculty members at traditionally minority institutions are not from minority populations underrepresented in the sciences.

- *Research-intensive institutions* (RIIs) have extensive research activities, strong science and medical research faculties, and advanced laboratory facilities and equipment. Some are universities with undergraduate programs; others offer only advanced degrees in research and the health professions.

TWO SUCCESSFUL PARTNERSHIPS

Two successful and very different collaborative partnerships are profiled in this section. One is the longstanding relationship between Brown University and Tougaloo College; the other is a more recent venture between Vanderbilt University and Meharry Medical College. Each of these partnerships illustrates four key determinants of success:

- Cooperative solutions to address mutual educational needs
- A strong institutional commitment
- Creation of productive collaborations between faculties of institutions with a history of mutual mistrust
- Coordination of effort for training programs.

FEATURES OF THE BROWN-TOUGALOO PARTNERSHIP:

- ▶ Started by presidents and trustees
- ▶ Involves a 4-year undergraduate college and a full-fledged university with wide differences in range of biomedical science curricula, number of science faculty, and capacity for research
- ▶ Entails a long-distance partnership that requires long-distance activities: student and faculty exchange, summer research training, remote research collaborations, and a bridge program to medical study
- ▶ Encompasses university-wide programs and student exchange, not just biomedical research
- ▶ Has evolved as Tougaloo has become better equipped to do research and write successful grants.

Brown University and Tougaloo College

The Brown-Tougaloo relationship began more than 30 years ago as a rescue effort. By the early 1960s, Tougaloo College, a small Black undergraduate college in Mississippi, was losing students and found itself in dire financial straits. Faculty turnover at Tougaloo was high, and the college faced certain closure if it could not find backing. Closure of the college would have been a serious loss because, as in most of the South, Black students were still barred from the state's universities and colleges under segregation. The Kennedy White House, meanwhile, was looking for ways to promote equal educational opportunity, and a Tougaloo trustee approached White House staff for help. A member of the staff who was in contact with the president of Brown University, Rhode Island, suggested that Brown enter into a partnership with Tougaloo.

Brown sent its young faculty members to Tougaloo to teach and, in addition to providing Tougaloo direct support, helped solicit funding for the college from the Ford, Carnegie, and other private foundations. At the time, this partnership was an unprecedented step

in American higher education. According to the program administrators, the fact that the partnership crossed racial lines created fodder for derogatory articles in major newspapers. Nonetheless, the partnership persevered.

Student exchange was one of the earliest programs, and Tougaloo students were encouraged to apply to Brown for graduate study. In the beginning, some graduating Tougaloo students completed an additional "bridge" year of undergraduate courses at Brown to bring their academic preparation in science to the level of Brown's first-year graduate students. This extra year is no longer part of the program. However, the partnership does have a true bridge program. After Brown's Medical School was founded in the early 1970s, the partnership established its Early Identification Program. Under this program, two Tougaloo sophomores are identified for admission to the medical school upon successful completion of all graduation requirements. As part of the program, these students spend an undergraduate semester at Brown, usually in their junior year, and familiarize themselves with the atmosphere at a research university. This experience cushions the transition to medical school and a northern urban environment.

The Brown-Tougaloo partnership was conceived as a multilevel arrangement that crossed departmental lines. Although funding for partnership programs comes primarily from Brown, institution-wide educational opportunities have balanced the partnership benefits over the years. As science and premedical students from Tougaloo spend semesters in Rhode Island, Brown students in literature, history, and art visit Tougaloo for courses and cultural resources not available at Brown, such as Tougaloo's extensive American art collection and its archives of the civil rights movement. Tougaloo students discover their preparation makes them capable of succeeding in a research-intensive university setting, and they often go on to seek professional degrees. Nonminority students from Brown discover what it feels like to be a visible minority in and out of class.

Faculty exchange, either for short-term training or for sabbatical research, is one of the regular activities that has grown out of the Brown-Tougaloo partnership and has contributed significantly to improving the science curriculum at Tougaloo. Although some Tougaloo science faculty conduct research in their own laboratories, they benefit from visiting colleagues at Brown and finding out what elements of Brown's science programs are most effective and can be applied at Tougaloo. Brown faculty also teach as visiting lecturers at Tougaloo.

The experiences gained through the Brown-Tougaloo partnership were influential to the recent formation of the Leadership Alliance, a 23-member institutional alliance among Ivy League, other research-intensive, and historically Black colleges and universities for student and faculty exchange, bridge programs, and minority recruitment into graduate and health professional schools. This alliance provides wider choices for minority students and faculty. It also increases the chances of an RII recruiting, if not the same students it supported in an undergraduate bridge program or summer enrichment program with a minority-serving partner institution, then students from other programs within the alliance. The alliance also makes it possible to generalize the experience and methods of successful collaborative partnerships among its members in order to foster the development of new partnerships that are more uniformly successful overall.

Vanderbilt University and Meharry Medical College

The Vanderbilt-Meharry collaborative partnership started in the 1980s with a one-on-one research collaboration between two Vanderbilt and Meharry faculty members. These two institutions are located in Nashville, Tennessee, within 2 miles of each other. Both have graduate and health professional programs (Meharry is a graduate institution only and has no undergraduate college) and both faculties conduct substantial and nationally regarded biomedical research. Each institution has its own areas of expertise and specialization.

These institutions had not collaborated previously because of the legacy of segregation, which had resulted in residual mistrust of each other's research, students, and faculty. Even after a bridge was built across the railroad tracks that had kept them on opposite sides of the city, a general lack of familiarity and communication persisted between the two institutions.

The one-on-one collaboration led the two faculty members to realize how convenient it would be for their departments to sponsor joint activities for graduate students. The Vanderbilt collaborator became the program director of an institutional NRSA training program grant from the NHLBI and set it up in an innovative way. Because both institutions have research laboratories, faculty from both institutions can participate as preceptors. Participating faculty from Meharry can therefore utilize the NRSA program to train their own students in their own laboratories, rather than losing students to Vanderbilt. Faculty from both institutions can serve on any participating graduate student's advisory committee. The training grant also supports joint seminars and a joint student journal club that focuses on the research areas in the overall training program.

FEATURES OF THE VANDERBILT-MEHARRY PARTNERSHIP:

- Started with a one-on-one faculty collaboration
- Involves partner institutions that both have research facilities and offer advanced degrees in the biomedical and behavioral sciences
- Benefits from close proximity, which permits frequent or even daily interchange and shared activities
- Creatively adapts a National Research Service Award (NRSA) training grant to support two-site funding and implementation of a graduate research training program
- Allows for departments to act as a single entity for some programs and activities.

STRATEGIES FOR SUCCESS

Overcoming Obstacles

Four of the most common challenges to building successful collaborative partnerships are trust, money, effectiveness, and knowing where to begin. These vague, yet emotionally charged issues can seem overwhelming—too large and complicated for one person or program to handle.

One of the forms these challenges, particularly money and trust, can take is bureaucratic resistance to the formation of a collaborative partnership with another institution. Resistance can range from unwillingness to supply secretarial support for the faculty member who wants to head a training program to rejection

of the proposal because of a perceived conflict between the mission of the institution and the aims of the partnership. These issues are not trivial to an administrator and may require considerable time and effort to resolve.

In many cases, partnership activities can be carried out at the departmental level so that they do not encounter objections from upper administration. But when student or faculty exchange are at issue, institution-wide policies for admissions, tuition, credits, salary, and tenure come into play. In these cases, the success of a collaborative partnership depends greatly on the ability to garner support from deans and other upper-level administrators.

Overcoming administrative barriers calls for an understanding of institutional policies and, if possible, some familiarity with existing accepted programs where administrators have shown flexibility. Knowing the system will help you decide where your activities will fit in with ongoing programs and demonstrate to administrators that your partnership is in line with your institution's priorities.

Promoting a collaborative partnership to administrators requires planners to:

- Present the objectives and advantages of the partnership and its activities, together with a solid strategy for funding them
- Show how the partnership activities fit in with the institution's existing mission and scope
- Describe the plan for coordination between the partner institutions
- Ask for specific and limited resources, exemptions, and accommodations necessary for the success of the partnership and its activities
- Identify strategies for minimizing the institution's costs (e.g., in dollars, faculty time, and potential controversy) and solving perceived problems.

The partnership approach presented in this guide will give you the tools to overcome many of the administrative barriers you may face. By collaborating with your planning partner at the other institution, you will be better able to clarify the specific obstacles that contribute to resistance and to resolve them.

Taking the Partnership Approach

A collaborative partnership is much more than a collection of training activities. The complexities of planning and implementation are greater than for individual activities or for activities conducted separately at each institution, but so are the rewards and opportunities. The following elements are central to building a research training partnership that takes full advantage of the opportunities available.

A written plan. Not every successful collaborative partnership uses a formal written plan or agreement. However, a written general plan is an effective tool for coordinating multiple activities, tracking support and participation, and identifying needs that emerge during the partnership. A plan reduces the chance of a misunderstanding between partners and clarifies partners' roles and responsibilities. It is also a good way to maintain a partnership when individual coordinators or faculty participants leave, and it can serve as a model for planning additional partnerships and collaborative activities.

Coordination. Central coordination is what brings separate training activities together in a partnership. Often the planning partners from each institution serve as the coordinators, or they may establish a coordinating committee composed of members from each institution. A coordinator serves as a liaison to administrators, the community, and outside agencies. The coordinator also oversees partnership activities, tracks funding and program needs, counsels trainees and faculty participants, and evaluates the partnership.

A team mentality. Fostering collaboration among participants, administrators, and trainees is a key benefit as well as a goal of the collaborative research training partnership. Collaboration is especially important for planning and program management. Many decisions an institution would ordinarily make on its own have to be coordinated between institutions to achieve the goals of the partnership, resolve problems, and develop creative approaches that fit both institutions.

Administrative buy-in. Although the relationship may begin with a collaboration between individual researchers at different institutions, research training partnerships for students necessarily involve departments and university or college administrators on issues such as recruitment, tuition waivers, housing, faculty time, and funding.

Focus on goals. A successful partnership is designed so that it can achieve its stated goals. Everything from recruitment strategies to performance requirements for trainees contributes to the goals. Evaluation and tracking tools are built in to indicate whether the program is working.

Focus on people. To maximize the retention of trainees and the productive participation of faculty, a successful partnership must identify and meet the needs of its trainees and faculty. Providing support services such as mentor training and financial counseling is an important part of meeting these needs. These services, if not already available, should be accounted for in grant applications to support the partnership.

Leveraging resources. A partnership provides great opportunities for linking funds and other resources, activity components, support systems, and expertise of partner institutions and of different programs or departments at each institution.

Looking Ahead

Although this guide follows a general chronological order for planning a partnership, some tasks are interrelated or must be started simultaneously for reasons of timing. For example, even though recruitment, evaluation, and tracking will be implemented after activities have been determined and grants have been funded, recruitment targets, evaluation criteria, and participant tracking measures need to be selected during the negotiation and activity design phases so that they reflect the overall goals of the partnership and the specific goals for each activity.

CHAPTER 2

2

Entering a Partnership

ENTERING A PARTNERSHIP

CONDUCTING A NEEDS ASSESSMENT
- List Your Needs and Resources
- Specify Your Goal
- Decide Whether a Partnership Is For You

IDENTIFYING AND CONTACTING PROSPECTIVE PARTNERS
- Locate Prospective Partners
- Identify Potential Resources and Contacts
- Select Your Negotiator
- Contact Prospective Partners

CHAPTER 2

Entering a Partnership

The first steps in building a collaborative partnership with another institution are some of the most important. Before considering specific activities or funding mechanisms, you have to know:

- What you want to achieve
- How to achieve it
- Which institution to approach.

Conducting a Needs Assessment

A careful needs assessment is the first step for entering into a partnership with another institution. It should include baseline information on:

- Your institution's capabilities, resources, and needs
- The current status of recruitment, retention, and training of minority individuals at all levels.

This assessment will help you formulate specific goals and criteria for success, and it will guide your choice of an appropriate partner institution.

List Your Needs and Resources

The first step is to determine what you need that is unavailable unless you enter into a partnership with another institution. These needs might include funding, facilities, faculty, or minority trainees. Then decide what you can offer a partner institution or department. (See table on next page.)

Specify Your Goal

Defining your goal in specific terms and determining what types of activities and resources are needed to fulfill it can help you choose an appropriate partner. Examples:

Goal

To increase minority participation in the graduate science program

Action

Recruit five well-qualified students from my institution's bridge program with a minority-serving undergraduate institution for each of the next 3 years.

Goal

To strengthen the biology and chemistry departments and curricula

Action

Recruit three new faculty members from my partner RII's postdoctoral trainee pool over the next 2 years.

Decide Whether a Partnership Is For You

Not every partnership opportunity is a good one, and even good opportunities have their costs in time, effort, personnel, and money. To avoid entering a partnership that might be more than your institution can handle, planners for existing partnerships recommend that you "estimate before you collaborate." Take some time to assess your ability to develop and sustain collaborative activities with another institution.

Ask yourself:

Is my primary interest in the partnership to enhance participation in research training by underrepresented minority groups?

If not, and if you are unwilling or unable to commit yourself and your institution to this effort as a primary focus of your activities, you might be better served by pursuing a different type of agreement, such as a subcontract for research, or a different type of partner, such as a health care organization.

NEEDS AND RESOURCES

	Research-Intensive Institution	Minority-Serving Institution
Needs	Minority students for graduate or undergraduate research training programs Greater diversity of research faculty Collaborators in a specialized area of research with particular interest and relevance to minority populations Teaching opportunities for graduate students Access to minority communities for health research funding	Research opportunities for science students and faculty Recruitment of experienced research faculty Specialized and advanced courses Access to advanced educational opportunities for students Guidance on writing successful grant applications Funding opportunities
Resources	Advanced science curricula Large science faculties Laboratory facilities Expertise in specific research areas and advanced research techniques Opportunities for sabbatical research Research training grants Grant-writing experience Departmental and library resources (e.g., journal clubs, seminars, courses) Access to Federal and non-Federal funding	Highly motivated minority science students Culture of strong faculty-student interaction and mentoring Access to research supplements and training programs for minority faculty, students, and institutions Access to minority community contacts

What will it cost me to participate?

Assess the probable cost to your institution for staffing, time, and resources, and determine what you will be able to do or get in return for these costs.

What would it cost me to implement my programs independently?

Is this cost more or less than the cost of implementing the programs through a partnership?

Will taking on this new partnership spread my resources (including faculty and students) too thin to be of value to me or my partners?

Determine how much of your institution's resources can be devoted to activities in this partnership. Also determine whether you need to add this partnership activity or whether you can achieve your goals through the existing partnerships.

Am I equipped to participate as an equal partner with my contact at the other institution?

Because many partnership activities are organized through personal contacts, you should examine not only the suitability of the match for your institution or department but your personal suitability to serve as the organizer. If you lack the experience or skills to work as an equal partner, can you develop them, learn from your contact, or get help from someone at your institution who does have the skills?

IDENTIFYING AND CONTACTING PROSPECTIVE PARTNERS

Once you have identified your needs and decided that a partnership can benefit your institution, you will need to find a suitable partner institution that has the required resources and faculty and administrators who are willing to collaborate.

Locate Prospective Partners

Unless you already have a partner institution in mind, start your search with some general resources. For example, a directory of MSIs granting at least a baccalaureate degree is available from the NHLBI. More complete lists are available from minority institution consortia and minority student and professional associations. Many of these resources are available online (see Appendixes B and C).

NHLBI training coordinators also can direct you to RIIs and principal investigators that have active research training grant programs in your research area of interest. A directory of currently active NHLBI-supported NRSA training grant programs, and the training coordinators responsible for them, is available on the Internet at the NHLBI home page:

http://www.nhlbi.nih.gov/nhlbi/train/nrsa_abt.htm

If you want to focus your partnership on a specific area of research that is not supported by the NHLBI but may be supported by another NIH component, contact the training coordinator at the appropriate NIH institute or center. You can access all NIH components through the NIH home page:

http://www.nih.gov

In addition to the NIH, other Federal research agencies support graduate research training in the biomedical and behavioral sciences. They actively encourage applications from minority individuals and frequently serve as go-betweens for collaborative partnerships between institutions. They can help you:

- Find a suitable minority-serving or research-intensive partner institution
- Structure your grants
- Link Federal and non-Federal sources of support for the partnership to take full advantage of supplements and other incentives
- Alert you to potential pitfalls.

Your institutional support office can help you identify agencies to contact, or you can access these agencies directly through the Internet at the following address:

http://www.fedworld.gov

Identify Potential Resources and Contacts

Seek out existing partnerships and collaborations

Your university or college may have faculty or administrators already working in partnerships or collaborations with other institutions. You could use these contacts to implement your proposed activities, work within an existing partnership or program, or get advice on structuring your own partnership plan from someone already involved in an established program.

FOR MINORITY AFFAIRS OFFICERS AT AN RII:

You may not be as familiar with the science departments at your institution as with the humanities departments. Your counterparts at minority institutions may range from student and career counselors to deans or even the president of the college; you need to develop a solid bridge between them and the health and science faculty at your own institution. In addition, remember that your institution's science and health departments are well connected with colleagues at other institutions and with research funding sources that could be used for training. Many of these departments are discovering that they lack the expertise or the information resources for effective minority recruitment. Talk with graduate and medical school deans and with science department chairs about their recruitment needs and the potential benefit of partnership opportunities with minority institutions to meet these needs.

Develop a team of colleagues for pursuing a partnership

Talk with the other members of your department or training program about forming a team to develop a partnership with another institution. Most interinstitutional activities with a large scope (e.g., student exchange, faculty visits, shared courses) will eventually require support from administrators. Starting with a team that includes interested faculty, the department chair, and key administrators (e.g., dean, minority counselor, budget officer, recruitment officer) makes it easier to garner that support.

Target your own administrators

They have a wealth of expertise that can help you identify potential partners and resources.

Department chairs know about research collaborations with other institutions, current curriculum needs, recruitment strategies, graduate and undergraduate research training programs, and administrative requirements for a proposed collaborative partnership.

Minority affairs officers can help locate and contact faculty at MSIs; identify available grant support for minority students or investigators in your laboratory; and locate institutions and principal investigators offering research opportunities to minority students. In addition, they can provide contacts for publicizing events or activities for the partnership.

Minority affairs officers often can provide feedback on aspects of the partnership that might be perceived as exploitative, ineffectual, or likely to provoke resentment. They should be consulted in planning partnership activities that involve recruitment of minority students, investigators, or faculty.

Career/student counselors and financial aid officers have information on graduate education opportunities, relevant contacts at other institutions (e.g., graduate program directors), admissions criteria, existing bridge programs, internships, summer training opportunities, student exchange programs, Federal agencies supporting graduate training, and nonuniversity RIIs such as national laboratories and medical centers that may offer internships and other forms of research training.

Research grants administrators know about existing shared grants and subcontracts with other institutions, as well as sources and strategies for getting grants.

Deans establish policy for undergraduate programs, graduate schools, and medical and other health professional schools. They have numerous contacts with other institutions, consortia, and private foundations.

Admissions officers and registrars have information on current admissions policies, bridge programs, and minority recruitment efforts.

Select Your Negotiator

As you consider a partnership, give special attention to three critical functions: negotiating, planning, and coordinating. These functions can be performed by one person or can be divided between two or more persons. Your negotiator and planner will set the tone, direction, and scope of the partnership, and your coordinator will guide activities as they develop.

Negotiating and planning are likely to involve various people at different levels in your institution, but, ideally, one person should be designated as the key negotiator and planner. This person will interface with the participants at your institution and with the key negotiator at your counterpart institution. Your negotiator is also the logical choice for coordinating activities as they get under way. With larger partnerships, a separate coordinator may be needed.

Ask yourself:

1. *At what level will my institution be involved in the partnership?*

   In the beginning, or if there are only one or two pilot activities being considered, the faculty member who is proposing the partnership is usually the negotiator and planner.

   If the partnership will involve several programs or activities, the department chair may be most appropriate.

   If the initiator is a minority affairs officer or student counselor, the program may cut across departments, including both science and humanities departments. The negotiator will have to consult closely with science department chairs for the research training components and will have to create productive contacts between these chairs and their counterparts at the other institution to ensure full agreement on the activities to be undertaken.

   If the partnership will involve several departments, a dean may be the appropriate representative and, for detailed planning, will work with the department chairs and faculty in both institutions.

   Negotiations and planning of initial activities can begin with faculty or staff. However, to negotiate contracts, admissions agreements, tuition waivers, and other institution-level policy for the partnership, department chairs, higher-level administrators, and the institutions' legal representatives must be involved.

2. *Who has the time, resources, and expertise to guide the partnership?*

   Negotiating and planning a partnership, supervising a collaborative program, and conducting site visits to the departments and institutions involved take a considerable amount of time, organization, and commitment.

   A truly overcommitted person may not serve the partnership best as a planner or coordinator in the long run but may be good as a negotiator to initiate the partnership and may be valuable as part of the team.

   A researcher who feels so time-pressured that he or she cannot take on another graduate student or lecture is probably not a good choice to plan or coordinate a partnership. Generally, this person would not initiate partnership activities or seek to become a coordinator, and getting him or her to participate as a research trainer may be difficult.

   On the other hand, someone with "too much free time" because of low involvement with his or her current work activities and colleagues is also unlikely to become sufficiently involved in a partnership. This person may be a good resource but may not have the strong contacts, grant-writing track record, supervisory skills, and organizational sense necessary to make the partnership a success.

Contact Prospective Partners

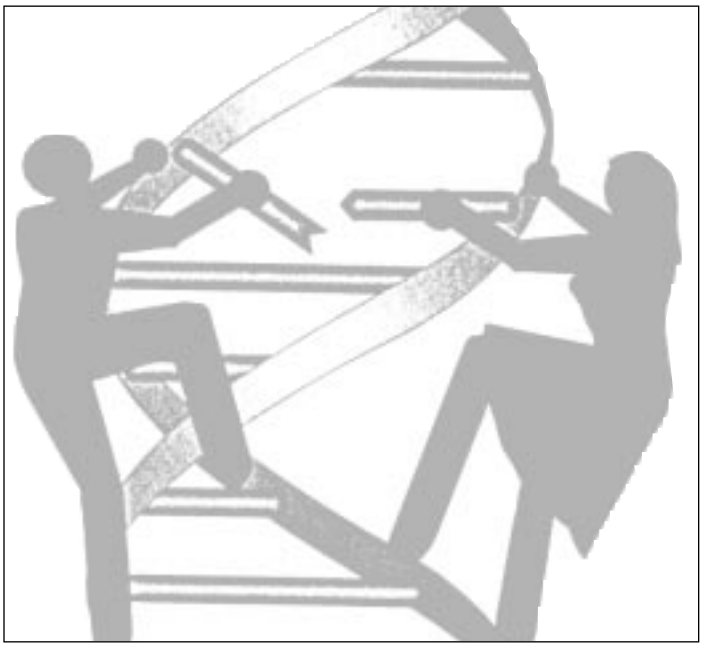
Once you have selected a prospective partner or set of partner institutions, you need to make contact with the right person there to set up a partnership program. If you already know someone at an appropriate partner institution, that's a good place to start. If you know which institution you want to create a partnership with, but do not yet have a contact there, ask your colleagues for recommendations.

Generally, your easiest first contact is someone in your position at the other institution. If you do not know anyone in this position, talk with the chair of the department you are interested in working with and ask for faculty members who might be interested in collaborating with you. With the department chair's support, your first contact with the recommended faculty members is more likely to generate interest.

CHAPTER 3

3

Negotiating the Partnership



Negotiating the Partnership

Creating Balance Between Partners

Establishing Mutual Goals
- Exchange Goals
- Refine the Goals

Choosing a Partnership Model

Planning Collaboratively
- Get the "Big Picture"
- Don't Do It Alone
- Keep in Touch

CHAPTER 3

Negotiating the Partnership

The negotiators' task is to come up with a workable agreement for the partnership. This agreement should:

- Be ethical, balanced, and of significant benefit to both partners
- Meet both partners' research training goals
- Be directed specifically to improve research training of minority candidates
- Delineate the training, financial, and other contributions of each partner and the distribution and control of grant funding between partners (e.g., through joint program grants or subcontracts)
- Designate activities and support components that will be designed and conducted jointly and methodically
- Include components for tracking and evaluation of activities and the overall partnership
- Be capable of expansion and sufficiently flexible to meet changing needs
- Include a written plan or record to ensure continuity and consistency throughout the duration of the partnership.

Creating Balance Between Partners

Creating a well-balanced agreement between different types of academic institutions is a very sensitive undertaking. All academic institutions have a central mission to maintain their autonomy. In order for institutions with seemingly unequal academic status, research capabilities, and resources to operate in a partnership, they must be able to reach agreements that treat both parties as competent equals with mutual responsibility. These agreements must confer benefits on each partner that are real, significant to that partner, and measurable.

The definition of a collaborative research training partnership set forth in Chapter 1 has far-reaching implications for building stable and productive relationships that can achieve the partnership's research training goals. The hallmarks of a balanced partnership are as follows:

- Both institutions have full status as partners although they may have different research capabilities and resources.

  Both partners must be actively involved in planning, grant writing, and management of the partnership, and both must benefit adequately, according to their own goals, for the partnership to work.

- The partnership evolves its own style of cooperation and coordination.

  Planning for small-scale activities may require little more than a phone call between faculty members, whereas larger, department-wide, and established programs may need a coordinating office at each institution.

- The home and host institutions must act in unison by conducting training in a coordinated fashion.

  Differences in academic criteria, tuition, access to resources, and other issues affecting trainees from the partner institution need to be resolved during the

THE RULES OF NEGOTIATION

Writing a partnership plan and the applications for grants to support it is a collaborative effort. Here are some general rules for successful negotiation.

1. Self-interest is the best motivator.

   Institutions and departments enter agreements because they expect to benefit from them.

2. Estimate before you collaborate.

   Before you sit down with your planning partner, you need to determine how much your institution can contribute and how much money it needs from the partnership grants to fulfill its role. You have already done part of this task in Chapter 1 when deciding whether or not to enter a partnership. When you meet with your planning partner, you need to discuss these estimates with each other openly and come up with a plan that will accommodate both sides.

3. Write yourself in or rule yourself out.

   To ensure that your institution benefits and that the partnership is designed to achieve your goals, you must participate actively in planning and grant writing. You cannot expect your partner to know your institution's needs and provide for them appropriately without your input. Planners from MSIs, in particular, generally have less experience writing grants and may be inclined to leave that task to the planner from the RII. Most research and training grants and supplements are typically awarded to the RII, which then controls the money. However, if you collaborate in planning, you can arrange for a share of that money to be subcontracted to your institution or to be specified in the application as support for improving your institution's curriculum and research infrastructure.

4. Collaborate with your collaborators.

   Partnership means more than just writing a plan together and never talking with each other again. Share as many activities as possible with your planning partner.

planning process. Coordinators or mentors at each institution should be in contact with each other so that trainees do not "fall through the cracks." They also should be prepared to negotiate with administrators at the host institution on behalf of a visiting trainee.

- The goals of both partners should be achievable through the partnership activities.

  Overall goals of the partnership and specific goals for each activity should be developed collaboratively.

- The goals of each partner do not have to be identical and usually are not.

  These goals, however, should be compatible, in keeping with a mutually agreed-on set of values, and explicitly stated. One partner's goals must not undermine the other partner's status or goals.

- Each partner is an autonomous institution with its own students, faculty, administration, facilities, curricula, and culture.

  Each partner has rights to collect tuition, pay salaries, set academic and professional standards, and determine its own curriculum and mission. Nothing in the partnership should serve to undermine any partner's identity or independence or subjugate one institution to another.

- Each partner institution has an obligation to the other to collaborate on agreed-on activities, share the financial and organizational burden, share relevant information, and coordinate efforts.

ESTABLISHING MUTUAL GOALS

Your first task is to reach a meeting of the minds on what the partnership will accomplish for each institution and what kind of partnership it will be. Planning around the wrong goal costs more—in money, time, wasted effort, and in loss of research training opportunities, prestige, and trust. Save yourself the time and frustration of initiating and engaging in plans that are based on false assumptions about each partner's preferences and positions. Discuss your goals first.

Exchange Goals

The whole purpose of a collaborative partnership is to pool the experience and resources of both partners. By discussing each partner's set of goals, you will come up with a better match of mutual and complementary interests than either of you could derive on your own. The stronger you make this match, the easier it will be to choose and design activities that can fulfill the overall goals of the partnership as well as each partner's specific goals. To develop mutually acceptable goals with your partner:

1. Discuss how your institutions can complement each other.

2. Choose a set of specific, complementary, and achievable goals.

3. Prioritize these goals—which are most important for each of you?

4. Place the goals you agree on in the order you want them to be achieved.

In working with your planning partner, keep the following in mind:

Be frank.

This is no time for hidden agendas. If your institution's main reason for entering the partnership conflicts with your partner's goal or its institutional mission, you need to know that up front and so does your planning partner. By being frank, you may nip in the bud what would have been a bad and expensive relationship and save you both some time and expense, or you may bring to light a potential conflict that you and your planning partner can address so that both partners' goals are acceptable and benefit both institutions.

What's good for your institution may not be good for your partner's, and vice versa.

Don't assume you know what your partner wants most or considers a real benefit. Your institutional cultures are likely to be different, and so are the practical burdens of implementing a plan. Your idea of a program that benefits your partner may have costs for your partner institution that you are not aware of. On the other hand, if you do not say what you want, your planning partner will not necessarily think of it and you probably will not get it.

Look for opportunities.

Your institution's goals may dovetail unexpectedly with some of your partner institution's existing plans or programs. Unless you voice your goals directly and specifically, you might never know of these unexpected opportunities.

Refine the Goals

After you have decided on goals for the partnership, you are ready to refine these goals and relate them to research training activities. Together, you and your partner should decide on target figures and success criteria for each goal. Use the numbers you developed independently when you decided on the breakeven points for entering the partnership (see Chapter 1). Examine each other's statement of resources carefully. The following considerations will help you and your partner refine the goals for the partnership:

1. Estimate the pool of trainees. For example:

   At what level are the trainees?

   Will they come from one partner institution or both?

   Will the pool include those not already in a science- or medicine-related course of study?

   What competing interests do potential trainees have that would lead them away from participating in our partnership program?

   What other partnerships do each of us have that compete for the same pool of trainees?

2. Look at the feasibility of your target figures. For example:

   Are these figures achievable between our institutions?

   Will this target make a significant difference to both of us? How much will my institution benefit?

3. Decide which types of activities fit your partnership goals best. A broad range of research training opportunities are available, including the following:

   Shared activities

   Bridge programs

   Student exchange and internships

Supplemental enrichment

Faculty training.

(See Chapter 4 for details about these programs.)

CHOOSING A PARTNERSHIP MODEL

Successful partnerships range from single, short-term agreements between neighboring institutions to elaborate, long-running programs involving many departments. Each type of partnership has its benefits and drawbacks. To avoid surprises and ensure that you and your planning partner are in agreement about the kind of partnership you want, you need to choose a partnership model that will suit your goals and activities. Some of the options for a partnership model are listed in the table on pages 29 and 30.

PLANNING COLLABORATIVELY

Now that you and your planning partner know what you want to do, you're ready to start deciding how. Planning a partnership can be a long-range effort. Collaboration is just as important for planning as it is for implementing partnership activities. The keys to collaborative planning are to look at the "big picture" of your partnership together, coordinate your efforts, and keep in touch.

Get the "Big Picture"

Not all of the following components are necessary for every activity or partnership. Also, in many cases, waiting to start any partnership activities until you finish writing a comprehensive plan in elaborate detail is neither practical nor useful—you may end up with a great plan but no partnership. However, considering the larger picture can help you improve your overall plan.

A user-friendly approach might be to discuss the range of activities you want to conduct with your partner, select some starter activities that do not require much set-up or advance funding, and sketch out an informal plan of the "big picture" that includes proposed future activities, needs, and coordination of the partnership as a whole. A more detailed partnership plan can be developed as activities are agreed on and put in place.

The steps for accomplishing the following tasks, and the respective roles and responsibilities of the partners, should be addressed jointly by both partners.

- Coordination
- Getting a commitment from your administrations
- Designing activities
- Establishing or arranging for support functions
- Staffing
- Arranging for facilities
- Filing for permissions
- Writing grants and creating a strategic funding plan
- Recruiting and selecting trainees
- Tracking and evaluating the program
- Revising and improving the program.

The amount of effort required to complete each component and how they fit together depend on the complexity and timing of each task, the number of individuals involved, and the structure of the partnership. All the components are interconnected, and they overlap in time.

For example:

Overall needs and partnership goals are determined first. They feed into later decisions on recruitment strategies, activity goals, and evaluation criteria.

Some decisions about the recruitment of trainees affect the activity design and funding decisions.

Criteria for program evaluation and participant tracking are selected during the design of activities, even though tracking and evaluation come during and after training activities.

Funding is the rate-limiting step in implementation because grant applications can take months to prepare and have approved. However, you will need to gather information from several other components in order to write grant applications.

Don't Do It Alone

Share the job of planning with your partner. Although some tasks can be handled separately, some must be agreed on before committing to them (see shaded box).

Keep in Touch

Meeting regularly with your planning partner, either by phone or in person, is an indispensible part of collaborative planning. It is also important for coordinating and evaluating your partnership activities. Meeting regularly not only allows you to compare notes and to ensure that your plans remain compatible with your goals as you progress, it helps you keep each phase of the partnership on schedule. It also provides opportunities for participating faculty and administrators from each institution to meet each other before program activities begin.

TASK SHARING

- ▶ Tasks that must be done together:
  - Trainee recruitment
  - Grant writing
  - Coordination
  - Evaluation
  - Program revision and improvement
- ▶ Tasks that can be done separately:
  - Getting your administration on board
  - Staffing
  - Arranging for facilities
  - Acquiring permissions
- ▶ Tasks that strengthen the partnership if done together:
  - Designing activities
  - Establishing support functions
  - Linking opportunities and program components
  - Selecting and monitoring trainees

Agree to meet, either by phone or in person:

- At the very beginning when you are setting up the framework for the partnership, coordination, and scheduling
- When you write grant applications
- When you are planning key shared elements such as recruiting and selecting trainees and designing activities
- When you bring participating faculty and staff together for orientation or program design
- When you design evaluations
- When you review activities and evaluations
- When you plan to end, renew, expand, or change the direction of the partnership
- When coordination of the partnership changes hands.

PARTNERSHIP OPTIONS

Type	Activities	Characteristics and Benefits	Possible Drawbacks
Short-term	• Pilot projects • Single shared project	Limited interaction and commitment Limited resources and faculty	Planners may end up reinventing the wheel with each partnership Suggesting a short-term partnership can be misread as lack of commitment
Long-term	• Multiple activities • Bridge programs	Goal is greater in scope than for a short-term partnership Requires internal coordination and oversight at both institutions Good for cultivating young trainees through repeat visits (e.g., short-term training sessions each summer) Can build on advantages of successful relationship	Time, cost-sharing, and faculty commitment can be greater than for a short-term partnership Can become "institutionalized" while straying from the goals of both partners if not reviewed periodically
Formal	• Research grants • Subcontracts • Tuition sharing or waivers • Shared courses • Bridge programs • Mentoring agreements • Joint participation on graduate advisory boards • Partnership activities used to apply for special partnership grants or administrative supplements	Requires a written plan Spells out obligations and eliminates some sources of misunderstanding	Risks inflexibility
Informal	• Spur-of-the-moment activities • Journal clubs • Joint seminars • Workshops • Short-term lab visits • Training in a particular technique • Graduate/undergraduate tutoring	Not all activities have to be short-term or time-limited Most feasible in local partnership Modification of activities is easier and more flexible	Can lead to misunderstandings over responsibilities, goals, arrangements, and treatment of trainees Does not eliminate need for strategic planning and evaluation of activities and the overall partnership

(continued)

PARTNERSHIP OPTIONS (CONTINUED)

Type	Activities	Characteristics and Benefits	Possible Drawbacks
Nearby	• Shared seminars and courses • Student internships • Research collaborations • Faculty training • Regular interdepartmental events and social activities • Joint graduate advisory committees	Allows frequent visits Fosters personal and professional contacts between institutions Permits frequent interactions Allows partner institutions to act as a single entity for the training program Keeps travel, housing, and phone expenses down	Not much change of scenery for trainees Possible underlying competition for trainees at institution or department level
Long distance	• Short-term training (2-3 months) in a host's laboratory • Sabbaticals • Summer internships • Student and faculty exchange programs • Videoconferencing and other distance learning activities	Provides students and faculty with new all-around experiences in a different culture and area of the country Individual short-term training internships can become a full-fledged program between partner institutions	Distance can be an obstacle to regular communication between home and host instructors Incurs high travel, housing, and phone costs Limits the number of possible site visits Costs can limit full participation of visiting students without other financial resources
Single program (department-wide)	• Shared courses • Journal clubs • Faculty training • Sabbaticals • Summer internships	Often involves only one department or laboratory from each partner institution Can be coordinated from within the department May need only limited external funding Usually involves a limited number of participating faculty and trainees	Lacks linkage with other programs to increase resources, opportunities, and pool of trainees
Comprehensive program (institution-wide)	• Student exchange • Summer internships • Sabbaticals • Graduate student teaching experience	Is almost always a long-term commitment (although individual programs may not be) Can create greater equity between partners by exchanging strengths among science and nonscience departments or programs Builds experience to help new programs improve overall participation of minority trainees	Generally requires extensive funding from multiple sources Requires a high level of commitment between institutions and requires centralized coordination to avoid duplication and contradiction of efforts Requires greater vigilance to ensure that all components of the program serve both institutions' goals

CHAPTER 4

4

Designing Collaborative Research Training

Designing Collaborative Research Training

CHAPTER 4

Designing Collaborative Research Training

Activities are the core of a collaborative partnership and are most frequently what fuels the original motivation to seek a partner. However, the context of a collaborative partnership does more than allow you to conduct a given training activity. It enables you to consider each activity in light of the others and to design it with the larger goals of the partnership in mind. By building on successful strategies and previously established resources, each well-designed and well-run activity becomes an opportunity to make systemic and lasting improvements in research training.

In addition to logistical decisions such as where the activity will be held, who will be responsible for selecting trainees, and so on, you and your planning partner will need to look carefully at how individual training activities are likely to benefit trainees and address in advance potential sources of attrition. Successful research training programs have two interdependent components:

- The training activity itself
- Essential support features such as tutorials, personal and financial aid counseling, and mentor training.

In this chapter you will find general considerations for activity design as well as strategies for planning specific types of activities and support components.

Designing Strategically

What makes for a good research training activity? How can you make sure your activities meet with approval from grant reviewers? How can you tell whether activities are effective in the long run? A well-designed training activity:

- Is relevant and builds skills necessary for a research career
- Requires the trainee to contribute intellectually
- Is specific and achievable within the resource and time limitations
- Includes enough positions for minority participants to make a measurable contribution to the final goal
- Has active recruitment plans to fill the trainee positions
- Has sufficient faculty commitment (e.g., for core mentoring or trainee positions) and administrative support (including adequate facilities, time, and resources)
- Has a built-in evaluation component that includes relevant criteria for measuring its immediate value to trainees and for identifying problems
- Contains a tracking component to determine how many participants advance to the next stage of a biomedical or behavioral research career.

Design for the Trainee

You can ensure that your training activities are appropriate for your trainees by:

- Looking at the requirements of the trainees' career paths
- Designing activities that are relevant to these career paths
- Avoiding nontraining activities
- Establishing appropriate and measurable evaluation criteria.

Look at the Trainee's Career Path

For your activity to succeed in increasing the number of minority trainees who actually become researchers, you have to know where your program fits into a trainee's career path. A would-be independent researcher in biomedical or behavioral science, minority or not, needs to achieve all of the following:

A Ph.D., M.D., or equivalent professional degree. In most cases, a master's degree is no longer sufficient to conduct independent research or to secure a research grant as a principal investigator.

Significant research experience and publishable work. This work includes a doctoral dissertation and generally at least 2 additional years in postdoctoral research to gain experience with techniques, grant writing, and submission of articles and to build up a curriculum vita.

Grant-writing experience. Grant administrators at the NHLBI report significant deficits in the quality and fundability of applications from inexperienced writers of research grants, particularly those from institutions where there is little collective departmental experience in writing research grants. Coaching by an experienced researcher who has a good track record of funded grants is an indispensable part of training.

Design for Relevance to the Career Path

Partnership research activities for graduate students, postdoctoral trainees, and faculty trainees should provide specific projects for independent research with agreed-on training and research goals and an appropriate level of mentorship.

Part of the research project should be the trainee's to design, conduct, and refine with help from a mentor.

It is best to decide what projects trainees will work on before the activity starts, inform prospective trainees up front of available research projects, and agree on criteria and expectations for their work.

In addition, any research activity should have specific, stated, and achievable expectations for trainees and culminate in a presentation, poster session, report, or similar event.

Nonresearch activities should foster research-related and stage-appropriate skills, such as interpretation of journal articles with peers, supervised teaching experiences, and mentored grant writing.

Lectures, courses, and workshops should give trainees information on biomedical topics or enhance their hands-on laboratory, computational, and research administration skills. The material should be appropriate to a trainee's stage of education.

For example, undergraduates might receive training in basic laboratory skills

and introductory topics in biomedicine, whereas postdoctoral researchers and new investigators would learn advanced techniques and grant-writing skills. However, basic techniques and introductory topics may be appropriate for a graduate- or professional-level trainee coming into the program from another discipline.

All training activities should include specific expectations for the trainee's performance. It does trainees no good to participate in activities that do not include specific expectations or add to their skills.

WHAT NOT TO DO

Activities or programs that, while purporting to be for research training, actually treat trainees as low-level employees not only defeat the purpose of a training partnership and waste the trainees' time, they deprive trainees of much-needed experience and skills that would help them reach the next stage of their career paths. With these kinds of activities, the program fails to achieve or demonstrate its long-term measurable goal of increasing minority participation in biomedical and behavioral research careers.

Many students, not just those from MSIs, do not yet have enough experience in a research setting to know the difference between routine tasks and original research work, and they do not realize that they should not be asked to do nonresearch-related errands for the program or for individuals. Often the program planners themselves don't recognize the potential for exploitation, but grant reviewers take a very dim view of these situations when deciding whether to award a program grant.

- Don't treat a laboratory trainee, particularly an undergraduate in a summer program, as a dishwasher or a "pair of hands" for routine work. This type of work should be done by a lab technician or a paid work-study student. Give your trainees real and specific research projects to work on or defined skills to master.
- Don't assign trainees to office tasks such as answering phones or doing other nontraining errands for the training program administration. Trainees are there to learn to do research, not to substitute for administrative assistants.
- Don't co-opt minority trainees as recruiters to boost minority participation. Word-of-mouth—going home with good things to say about a particular program—is fine, but in some cases, program administrators latch onto minority trainees to do more promotional activities than they have time for if they are ever to learn anything about doing research. Again, the trainee's job is not to promote the program but to learn research skills.
- Don't have low expectations for your trainees. Students who want to reach professional status need a clear and explicit road map for what it takes to get there. Lowering expectations for their immediate performance deprives them of that essential information. Maintaining low expectations for their ultimate level of achievement (e.g., "a master's degree is good enough") can derail them from a research career.

Establish Evaluation Criteria

Being able to measure the success of your efforts is an important part of ensuring a positive research training experience. Evaluation criteria need to be measurable and appropriate to each activity and the overall partnership program. Although evaluations will be carried out during and after the activity takes place, the time to set your evaluation criteria is now. Key questions to ask yourself are:

- What is the purpose of this activity and how does it contribute to the trainee's career path?
- Where does this activity fit in with the goals of this partnership?
- What will the trainee get out of it?

When designing activities for trainees, identify and set criteria for measuring each trainee's participation and performance, each faculty member's participation and performance, and the effectiveness of these activities for achieving the goals you have set. Specific evaluation considerations are given in Chapter 7.

Link Related Opportunities

Successful research careers encompass much more than laboratory work alone. A well-rounded career demands interaction with other members of the research community. Experience is gained through personal contacts and informal exchange of ideas, research collaborations, professional activities such as serving on a journal's editorial board, participation in professional societies, and acquaintance with current achievements in the field.

Introducing trainees to the broader scientific community gives them a better idea of the profession as a whole and strengthens their sense of belonging to it—an important factor in preventing attrition. Here are some ways to create a sense of community among your trainees:

Promote interaction and exchange of ideas between the trainee and department faculty, other students, and other trainees in both formal and informal settings.

Offer a research training activity (e.g., shared courses, journal clubs) to trainees from both institutions and let the trainees interact as peers.

Provide trainees with access to the same institutional resources (e.g., libraries) available to students and faculty outside the partnership.

Provide further opportunities, through referrals and recommendations, to help interested trainees attain the next level of research training and expertise.

Give trainees contacts for future research.

You can also build new opportunities for research and training by using the contacts made between participating faculty in each activity. For example, you can:

Stimulate additional collaborations between researchers at the partner institutions

Create lasting resources (e.g., educational materials, curricula, facilities, contacts, trainee rosters) to support future activities

Maximize the research training capabilities of both institutions (e.g., by enhancing curricula, lab equipment, computers and

facilities; providing grant-writing assistance; or hiring faculty).

To foster a stronger buy-in of all participating faculty into an activity and the partnership program, consider bringing together faculty from both institutions to brainstorm, discuss content and logistics, and set evaluation criteria for activities. Faculty know their own students and trainees. They can also identify problems and considerations specific to their own work environment.

BUILDING SUPPORT SYSTEMS

Even well-designed activities may fail to achieve their objectives if trainees or participating faculty have needs that compete for their attention or do not allow them to participate fully. Systems need to be developed and incorporated into the partnership to provide adequate support for both trainees and faculty members.

Support Trainees

Attrition is the greatest challenge a research training partnership has to overcome. It is cumulative, compounded by dropout rates at each stage of education, and cannot be addressed adequately through individual activities. For minority students entering college, low starting numbers and disadvantaged starting conditions narrow the pipeline more sharply than for all other students in the sciences. Even among those who do well in their undergraduate science and math courses, few graduate or continue on to graduate and professional schools.

What happens during the undergraduate years is unclear. For years, it was thought that these students dropped out primarily because they could not keep up academically. However, a number of large granting organizations have found that issues related to the social climate have a greater impact than the students' academic ability on whether they finish undergraduate study and go on to professional careers.

Building support systems into the partnership plan, whether they are components created just for the partnership or existing institutional services to which the partnership has access, appears to prevent some of these problems and increases the retention of trainees.

Common Challenges to Retention

Challenges that minority students face when they pursue a research career include:

Isolation. Minority trainees at an RII, particularly visiting students, are extremely susceptible to isolation on campus. They often have few social contacts and limited interaction with the community outside the classroom or laboratory. Students who do not gain these contacts and who continue to feel they do not belong have a higher risk of dropping out.

Poor communication between faculty and trainees. Significant cultural differences persist between the styles of communication used by minority and nonminority individuals. The undergraduate teaching environment also has very different expectations and references than arise in a research environment. Misunderstandings early on between a trainee and a preceptor from different institutions can create enough distrust to shut down communication. Trainees at a more advanced stage of their careers usually have enough experience to know how to handle these situations, but younger students may misinterpret the situation as hostility or as a sign of their unsuitability for research.

Personal finances and competing needs. Financial concerns are a significant factor for many minority students, who may have to balance their aspirations for a research career against family pressures to get a job quickly or move back home. Summer jobs often take priority over other opportunities because of financial need. Few minority students can afford to take an unpaid internship, even if room and board are included, and the cost of living is often higher in the cities where RIIs are located than at most MSIs. Moreover, because well-paying jobs are also a status symbol, the salary of a simple office job that is available right after college may appear more attractive to an inexperienced student than a professional career that will require several more years of effort and pay significantly less in stipends.

Disapproval from culture or family. In some cultures, it is not customary for children, including young adults, to spend long periods of time far from home, or they may be expected to stay with the family when not in school. These expectations often apply particularly to young women, and in some cases the family may be reluctant to pay for or allow attendance at college and other "away" opportunities for their daughters. Perceptions are changing with the increased need for a college education in employment, but these attitudes persist in some areas of the country.

Security. Security is a big concern for minority students and their parents (and their advisors at MSIs). Personal safety in the laboratory is one aspect of security; others include safety from harassment and isolation, inclusion in regular departmental and social activities, and fair treatment by faculty mentors.

Fear of incompetence or stigmatization. Fear of not being accepted as competent keeps many students at MSIs from applying for the opportunities available to them. However, those who do participate in student exchange and find they can do well in courses at an RII come back to their home institutions with greater confidence and more enthusiasm for pursuing an advanced degree.

Retention Strategies

Seven strategies that you can adopt to encourage minority trainees to continue toward a research career are:

Promote the full career path. At every step of a trainee's education, professors, student counselors, and departmental advisors must recommend that students try to attain the full career path to become independent investigators. These mentors should encourage them to take the next step after the current activity and counsel them constructively about what courses, qualifications, tests, grants, institutions, career moves, and options will serve them well in the future. In the context of a partnership activity, this type of counseling may be standardized or individualized, but all faculty or other mentors for the trainees should know that this is expected of them and is a high priority for the partnership.

Establish social activities. When trainees discuss research ideas informally with peers and faculty outside of class, they not only create social contacts with other trainees, they become more involved in the science community of the institution and gain confidence that they really belong. More of these trainees maintain interest in their work and complete their training. Informal elements

such as regular journal clubs, peer study groups, meetings with mentors or preceptors, and departmental social events bring minority trainees together with the rest of the departmental trainees in a context where common research interests and achievements can create common ground.

Orient the group. It is important to set out objectives and standards for each trainee's performance and to establish an initial rapport with the activity director as someone to whom trainees can turn. Program directors and partnership coordinators may meet with trainees and faculty preceptors together or separately on a regular basis.

Provide tutorial and peer study group activities. Supplemental training can bring the skills of trainees with less background to parity with those of their peers outside the partnership and can foster a sense of teamwork. Examples of the types of supplemental enrichment programs that have been useful and effective are given at the end of this chapter.

Foster communication between faculty at both institutions. A joint activity can include mentorship by faculty from both institutions. In addition, if a misunderstanding arises, a trainee's preceptor can consult with the trainee's mentor or department chair at the home institution to reestablish trust.

Pay competitive stipends. Stipends reinforce the value of science activities not only to trainees but to their families. For summer trainees, a stipend can help offset out-of-pocket costs that would keep them isolated on a host campus, and it can replace the money they would otherwise be expected to earn at a summer job.

Provide financial and personal counseling. Be aware of your trainees' concerns and let them know that they need not interrupt or give up on their education or careers. Let your trainees know about your institution's student counseling and financial aid offices and make arrangements for them to have access to these offices. Check in with your trainees periodically to make sure they get the help they need.

Support Faculty

Research training partnerships depend on faculty who are interested in and committed to both the overall program and the activities designed for the trainees. But they, too, are challenged by conflicting demands, and you may have to encourage your institution to adopt strategies that will improve faculty participation in these partnerships. In addition, faculty often need support to improve their mentoring and grant-writing skills—two essential functions of the research training they will provide in a partnership.

Challenges to Faculty Participation

Institutional criteria for faculty promotion and tenure. Current promotion and tenure criteria for faculty at most universities pose problems for partnership and research training activities. MSIs typically focus on teaching as the top priority for faculty members, and faculty teaching loads are generally heavy, particularly in small science departments. RIIs, on the other hand, tend to base tenure decisions primarily on the quantity and quality of a faculty member's published research. Faculty from each type of institution have real reason to worry that involvement in research training partnership activities with another institution will be regarded as irrelevant to

their job descriptions when it comes time for promotion or tenure.

Time. For an MSI science faculty member to conduct research at a research-intensive partner institution, time away from the home institution may require others in the department to shoulder a considerable additional teaching burden. On the RII side, while many research faculty recognize the value of training the next generation of investigators and are committed to this goal, training obligations, particularly for outside students or guest faculty from other institutions, are sometimes seen as a drain on research time and productivity.

Limited opportunities for research. Although short-term approaches are useful for training in specific techniques and for giving a science instructor perspective on experimental methods, both are too piecemeal to accommodate substantive research unless the research experience is extended or the research project can be conducted from the home institution. The question often arises at MSIs over whether training their faculty in cutting-edge research methods makes sense when there are few or no research facilities on campus, little or no money to build any, and little or no opportunity for faculty to conduct research at their home institutions. Departments have to consider how providing faculty with limited research training and opportunities compares with the cost of hiring replacement faculty for a sabbatical year or semester and allaying possible friction among faculty members.

Strategies to Support Faculty Participation

Give faculty release time from their teaching loads. Reducing the teaching loads of participating faculty may allow them to participate in research training either as trainers or as trainees. Such a strategy might require release time to be evenly distributed among all faculty in a science department, but departments may be able to make their own arrangements without the need for extensive administrative involvement.

Compensate faculty for their cross-mission efforts when they are evaluated for promotions and tenure. Such compensation is an important step for encouraging widespread faculty participation in collaborative partnership activities. Because promotion and tenure decisions are the province of deans, it is important to gain their support for a shift in criteria for faculty achievement. Individual departments that value partnership activities should find ways to compensate participating faculty by counting their contributions toward promotion and tenure qualifications. If the upper administration is unfamiliar with or unaccepting of this criterion shift, departments and partnership coordinators should help participating faculty find ways to demonstrate the "right" promotion and tenure qualifications through their partnership training and research activities.

Mentoring

Mentoring is an essential part of hands-on research training. Collaborative partnerships lend themselves to a variety of mentoring activities, including the following:

- Serving as a thesis advisor for a student from the partner institution
- Hosting a partner's student or faculty member for a summer or semester of training
- Coaching colleagues from the partner institution in grant writing and management of research grants

- Having your graduate students tutor undergraduate students from the partner institution.

Good mentoring does not come naturally to most people, and bad mentoring—either negligent or actively hostile—destroys or wastes opportunities for your trainees, faculty members, departments, and institutions. These problems can be amplified within the context of a partnership, where the balance of trust and benefit is delicate to begin with.

Providing mentor training is therefore a good investment. It, like many of the other support components mentioned in this chapter, can be simple or extensive, ranging from a simple faculty orientation to a full-fledged workshop. Your institution may already be incorporating mentor training programs into its general orientation for new faculty—check with your department chairs. If not, the Internet now provides several web sites on mentoring. One of the leading model programs for mentor training, which provides information online, is the Harvard Medical School Faculty Development and Diversity Program (see Appendix D).

To promote good mentoring:

- Provide orientation to the faculty for each training activity. Present the objectives of the activity and reiterate the goals of the partnership.
- Present specific criteria for good mentoring and examples of bad or unacceptable mentoring.
- Adopt a rational but flexible system for matching faculty mentors with trainees.
- Include consultation between faculty mentors at the host institution and a trainee's advisor, professor, or department chair at the home institution as a required or regular part of the training program.
- Establish an ombudsman for trainees (often the partnership coordinator) and a plan for improving poor matches or reassigning them.
- Reward faculty participation and good mentoring.
- Secure adequate time and salary resources to support mentorship in partnership activities without overburdening the department or the participants.

Grant Writing

Collaborative research training partnerships present a strong opportunity to train graduate students, postdoctoral researchers, new investigators, and faculty members who lack the grant-writing skills that are critical for research management. Some possibilities for coaching include:

- Joint writing of grant applications with an experienced faculty coauthor who has a good track record in obtaining research funding and faculty or doctoral trainees from the partner institution.
- Participation in grant-writing workshops for faculty, doctoral, and professional-level trainees at both institutions. Many RIIs already have these and open them up to nonfaculty participants.
- Use of Internet resources such as the tips and training materials available from grant, fundraising, and Federal agency web sites.

SPECIFYING PARTNERSHIP ACTIVITIES

Research training programs can take many forms and involve varied activities. Described in this section are the main types of programs or activities that institutions have used and the NHLBI has supported through research training grants. The descriptions below include the supporting elements needed to initiate or sustain the programs or activities and suggested strategies for incorporating them into research training partnerships.

Shared Activities

Most shared activities might ordinarily be conducted separately at the partner institutions and often cost little to conduct jointly. They can help institutions avoid duplication of effort while bolstering lecture, seminar, and journal club attendance in small graduate departments. In the case of a jointly taught course, they allow faculty at the partner institutions to switch off with each other and, perhaps, lighten their teaching loads slightly.

Moreover, jointly held graduate training activities can be used to reinforce joint research programs, such as an NRSA training grant, that may not be department-wide in either institution but may focus instead on a specialized area of research developed between the two. Interinstitutional journal clubs dedicated to a specific research area may be more appropriate than single-institution, department-wide clubs and can give students, postdoctoral researchers, and faculty working in that research area a sense of unity.

Types

- Joint lectures
- Journal clubs
- Departmental seminars
- Shared courses.

Supporting Elements

Frequent (weekly or more) student and faculty visits to the partner's campus. Generally, shared activities are practical only for partner institutions located in the same city or town.

Institutional resources and facilities. In addition to laboratory or lecture hall accommodations, amenities such as graduate libraries and laboratory space need to be made available to trainees and faculty from the partner institution.

Tuition waivers or arrangements. These special considerations may need to be made for students training at the partner campus.

Salary payment for faculty. An appropriate payment must be decided for faculty teaching at the partner institution.

A culture of mutual respect. The department chair and participating faculty must promote mutual respect among faculty and trainees at the partner institutions.

Credit for faculty participation. Department chairs and administrators should credit faculty participation in partnership activities. Participation should not have negative professional consequences for promotion or tenure.

Partnership Strategies

- Keep salaries and tuition at the home institutions for students and faculty, or split the cost of a jointly taught course between the partners (e.g., each pays for its own faculty).

In many instances, little financial rearrangement is needed, particularly when the cost of providing the course itself is low.

- Cover the costs of a joint activity through a program grant. Costs relevant to a specific training program grant, such as an institutional NRSA, can often be paid for by the program grant as part of regular research training activities.
- Create incentives and rewards for participating faculty.

Student Exchange and Internships

Student exchange and internship activities provide courses and hands-on experience that many MSIs cannot provide directly. They let undergraduate trainees try out biomedical research careers in short-term summer lab positions before deciding whether to apply for graduate school, and they let students from MSIs test out the social atmosphere at RIIs where they are likely to go for graduate degrees. These activities also provide graduate students at RIIs with the teaching experience they need to apply for faculty positions after graduation.

Types

- Short-term undergraduate internships in a host university laboratory during the summer or off-quarters
- Courses at the partner institution
- Graduate student teaching opportunities in a partner's undergraduate program.

Supporting Elements

Stipends for participating students. Expenses for room and board also should be covered.

Resident advisors. By placing advisors in dormitories, students can access counseling when they need it.

Advocate or ombudsman. Trainees need access to an advocate or ombudsman. Usually this person is the program or partnership coordinator.

Close contact between the program coordinator and trainees. The program coordinator must be able to contact a trainee's family and home institution advisors.

Safety measures and safety training. All students should be trained in laboratory safety procedures.

Social and informal training activities. Student retention can be enhanced by promoting students' interaction with other students in and out of the partnership activity.

Partnership Strategies

Both RIIs and MSIs have a long track record and well-established policies for conducting student exchange and internship programs.

- Consult your department chairs and deans.

Bridge Programs

Medical schools have pioneered the sponsorship of innovative premedical programs at partner undergraduate institutions, guaranteeing admission to minority students who successfully complete these "bridge" programs. These programs join a growing trend of industry- and professional association-sponsored education and internship

opportunities for students in other scientific and technical fields. All of these efforts reach into the talent pool at an early stage, providing or supplementing prerequisite training and creating long-term connections between participants and the sponsor so that students will look to the sponsor for their graduate education (and employment, in the case of industry sponsors).

Types

Bridge programs between medical schools and undergraduate MSIs come in two general forms:

- Curriculum enhancement and extra tutoring for students in the program during their undergraduate years, sometimes including summer research training at the medical school. Some of these programs also offer continuing education, workshops on specific techniques, and advanced subject seminars for faculty from the undergraduate institution.
- Postgraduation programs that may last from a few months to a year after trainees finish their baccalaureate degrees and include preparation for the Medical College Admissions Test (MCAT).

Bridge programs in medical schools generally are not designed to prepare trainees for research or for M.D./Ph.D. programs, but they serve as a model that can be modified to improve research opportunities for minority trainees. The NIH and the NHLBI support a variety of bridge programs that emphasize research skills and training toward a Ph.D., M.D./Ph.D., or other professional degree, including programs between:

- Two-year or junior colleges and universities with full undergraduate and graduate degree-granting programs
- Four-year colleges and universities with doctoral programs
- Institutions offering only the master's degree and institutions with doctoral and professional degree programs.

Supporting Elements

Competent partner institutions. RIIs must be able to support enhanced programs at a partner minority institution and accept graduates as incoming predoctoral students. MSIs must be able to implement a significant change in curriculum for their undergraduate students and be willing to encourage participating students to attend graduate programs specifically at the sponsor institution.

An early start to pregraduate training. Graduate research programs may not be as amenable to the postgraduation short-course model of bridge programs as medical school programs are. In many cases, waiting to supplement science and math skills until after graduation is insufficient for students who wish to enter a graduate research program. Curriculum-building and tutoring activities during the undergraduate years are likely to be more effective in providing students with the knowledge and skills needed for graduate work.

Increased awareness of research as a viable career choice for minority students at the undergraduate level. Possibilities for stimulating interest include presentation of current research news in class, requirement of science majors to spend a semester doing independent work with a professor, and encouragement of student participation in research training internships.

Inclusion of independent research activities. Hands-on research is not an integral or required part of most undergraduate science curricula; undergraduate biology and chemistry lab sessions generally present cookbook experiences and teach techniques, rather than exploring something new. Participating in research training internships, developing independent projects with a professor, and working summers in a laboratory are ways for students to gain experience in investigating new problems.

Workable selection criteria. A rigid admissions policy at the partner RII can interfere with student exchange and bridge programs.

Program elements that increase cultural acceptance. An effective way to counter negative faculty and student attitudes is to foster communication between minority and nonminority participants as a regular part of the program.

Partnership Strategies

- Build ties between the RII graduate program and the undergraduate MSI curriculum through joint courses, workshops on techniques, summer research training experiences, student exchange, faculty exchange, postdoctoral teaching rotations at the MSI, advanced training opportunities for MSI faculty at the RII, and videoconference courses and other forms of distance learning.
- Expand the research capabilities and laboratory facilities of the MSI using grant support for facilities and equipment by the NIH National Center for Research Resources, the National Science Foundation (NSF), and private organizations. This expansion will enable the MSI to increase the number of undergraduate students who have hands-on experience with research techniques and allows the bridge program to provide onsite workshops and courses that require laboratory equipment. The students will come to the RII better prepared for graduate work.
- Exempt some student exchange activities from the normal admissions and matriculation criteria, or create new policies on guaranteed admissions for successful students in pipeline programs supported by the graduate institution at a partner undergraduate institution.

Supplemental Enrichment Programs

Supplemental education programs form the core of many bridge programs between medical schools and minority undergraduate institutions. They are also offered to minority and disadvantaged students in numerous mainstream undergraduate institutions. These programs, often called “remedial help,” are sometimes necessary for students entering undergraduate study with a weak background in science and math. However, unless they are carefully designed to bring the students to parity within a reasonable period of time, they can create more problems than they solve.

The purpose of a supplemental enrichment program is to give students the credentials they need to pursue training for a research career. Programs need a clear training focus and a well-defined timeframe. These supplements are not substitutes for core science and math courses. Many institutions give these programs reduced credit or require them based on entrance test scores but give no credit for them. Students who start out needing extra help with fundamental skills should know they will not always need this help and that it does not mean they are barred from choosing

career-path science and math majors. The departmental culture should support these programs fully by not fostering false assumptions among faculty and regular-track peers and by encouraging students in supplemental programs to work hard and achieve at a high level both during supplemental courses and in subsequent regular studies.

Types

- Supplemental courses in basic science and math
- One-on-one tutorials
- Peer study groups
- Workshops in laboratory methods
- Preparatory classes for the Graduate Record Examination (GRE) and MCAT.

Supporting Elements

A limited engagement that fits the long-term goals for research training. Students who start out needing extra help should be able to move ahead. The most successful programs for remedial assistance are designed to get students up to speed no later than the beginning of their third undergraduate year so that they are well-trained, capable, independent, and ready for the next step by the end of college.

A social network that keeps students from feeling isolated. Isolation is one of the identifiable risk factors for dropping out. Some enrichment programs include formation of study groups early on to stress cooperative problem-solving in math and science courses. Sometimes these peer groups remain in contact throughout the undergraduate program.

UNEXPECTED BENEFITS

Graduate students from the Baylor College of Medicine designed and put on a 1-day "Laboratory Calculations" workshop for undergraduate students at Texas Southern University. The workshop was a hit, bringing together a number of common calculation methods that are not usually taught in class and giving the undergraduates a chance to practice them. However, there was an unexpected additional benefit—student and faculty organizers realized how useful the program would be for all undergraduate students, and the workshop is now a regular event.

Avoidance of "minority-only" focus. Minority students are not the only ones who can benefit from supplemental programs and basic workshops. Often a program designed for incoming minority students turns out to be just as valuable for the institution's nonminority students at the same level.

Partnership Strategies

- Promote graduate-undergraduate activities. These can create stronger ties between students at both institutions so that minority undergraduate students considering summer exchange programs or graduate education at an RII will already know someone in the RII laboratory or department. Graduate students from an RII who teach courses at MSIs also gain crucial experience that will help them qualify for jobs in academia, many of which will be at small, teaching-intensive institutions.

Faculty Research and Training

In recent years, a growing movement has emerged in biomedical research and the biotechnology industry to change the teaching paradigms at undergraduate and graduate institutions by placing greater emphasis on hands-on laboratory experience and research training in science curricula. Opportunities and grant support, from both governmental and private sources, are available for MSI faculty wishing to engage in research training themselves. Moreover, the research experience enables them to return to their home institutions with fresh approaches for teaching students and gives them solid contacts with researchers at RIIs who may later host some of these students in their laboratories.

Faculty research and training opportunities hold significant advantages for both partner institutions in the formation of a collaborative research training partnership. RII faculty want contacts at other universities for collaborative research, access to qualified minority students, and sometimes access to special populations or other resources for which MSI faculty have contacts. Faculty at MSIs want research opportunities and equipment their schools cannot provide, both for themselves and for their students. By increasing the research capabilities and opportunities for MSI faculty, a collaborative partnership strengthens its resources for the future.

Types

- Conventional or mentored collaborative research
- Faculty exchange
- Short-term internship in a host's laboratory to acquire specialized techniques
- Enhancement of current faculty training levels and recruitment of new faculty through connections made at a partner institution
- Collaboration and coaching to develop the grant-writing skills of participating MSI faculty.

Supporting Elements

Salary and promotion incentives

Sabbaticals, release time, and adjustment of teaching loads for training

Equipment and facilities

Good mentoring

Adjustment of promotion and tenure criteria.

Partnership Strategies

- Promote short-term summer research training. In some cases, these shorter programs may be more feasible than a semester or a sabbatical year.
- Encourage part-time or weekend research. If the partner institutions are located near each other, part-time or weekend research may be possible for an MSI researcher willing or able to work the extra hours.

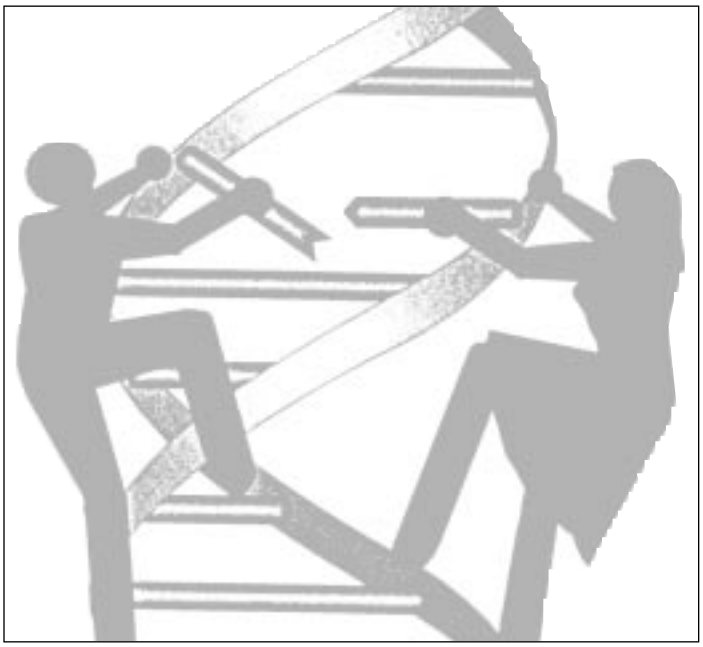
TAKING THE NEXT STEP

Once you have designed your activities and decided on the support that you will offer your faculty and student trainees, you are ready to start writing down the details of your partnership design and making out your shopping list for funding. Writing the plan and getting funded are addressed in the next two chapters.

CHAPTER 5

Writing the Plan

5



WRITING THE PLAN

CONSTRUCTING AN AGREEMENT

WRITING IT DOWN

CHAPTER 5

Writing the Plan

What can a written plan do for you?

It can help:

- Establish coordination between you and your partner institution and among the directors of training activities
- Ensure continuity of purpose and consistency among all components of the program
- Provide a long-term record of decisions in the partnership
- Document important information to include in grant applications, and it can be attached as supplemental information to these applications
- Promote and defend the partnership to administrators
- Project your partnership as a model for new partnerships.

A written plan can serve as your partnership agreement, detailing all aspects, roles, and responsibilities and outlining your agreed-on activities.

Constructing an Agreement

How you write your plan or agreement is up to you and your planning partner, but regardless of the form it takes, some type of written agreement is needed. Whether the agreement is extensive or not, it should encompass the understanding you have achieved.

How much of your plan needs to be in written form?

Anything from a simple letter of agreement to a file cabinet with extensive notes can work, depending on the type of partnership you select, the grants and contracts that support it, and the administrative requirements of the partner institutions.

Some agreements are specified completely by an umbrella grant for the program or by a contract between the partner institutions.

An agreement that includes grants and contracts as well as activity plans and discussion notes is better suited to a complex, long-term, or flexible partnership.

A comprehensive written agreement includes the following components:

- Description of the partnership, including goals, scope, partnership model, and activities

- Grants, subcontracts, and other legal agreements between the partner institutions which specify tuition, credits, admissions, subcontracts, salaries, waivers, and so on
- Activities, support services, and recruitment plans, including selection criteria for trainees, pertinent evaluation criteria, and funding or resource needs
- Coordination details and plan
- Notes on faculty participation
- Grant funding strategy
- Permissions and licenses (e.g., animal or radiation user licenses)
- Evaluation and tracking systems
- Timeline.

WRITING IT DOWN

1. Decide how much needs to be written down and who needs to write it.

   For a formal partnership that has complex program needs such as special admission agreements, specific contracts will need to be drawn up. Writing these agreements is likely to involve upper-level administrators and finance officers.

   For a simple partnership activity, the agreement could be documented by letters or notes from phone calls. At a minimum, you should keep some written record of your agreement and notes on how it will be implemented.

2. Balance the benefits and burdens.

   In writing the plan, ensure equity of credit, administrative responsibilities, financial advantage, and research opportunities between the partner institutions.

3. Allow sufficient time in the agreement for planning activities and writing grant applications.

4. Make sure the partnership has sufficient support.

   Provide for internal administrative services and office space, faculty release time and sabbatical replacements, and other administrative concerns.

   Detail all equipment, facility upgrades, curriculum development, salaries, travel, faculty recruitment, support services, publicity, lodging, and so on that need to be provided for each activity and for coordinating the overall partnership. Describe how you will fund these needs internally through your institutions or through grants awarded to the partnership (see Chapter 6 for advice on getting funded).

   Obtain all necessary permissions and contracts. These may include radiation user licenses for trainees, consent forms for students, contracts for tuition reimbursement, exceptions, and other items.

5. Be flexible.

   Specify the support and features that are adequate to maintain the partnership and discuss ideas for future expansion. Build into the agreement periodic meetings with your planning partner to evaluate performance and reassess partnership needs (see Chapter 7 for evaluation hints).

6. Keep an updated list of all people and offices involved in the partnership, what contracts have been included, and who maintains them.

CHAPTER 6

6 Getting Funded

GETTING FUNDED

CHAPTER 6

Getting Funded

Getting funded is a major advantage of partnerships. This chapter will help you:

- Determine how much funding you really need
- Recognize opportunities for making in-kind trades
- Identify all possible funding sources
- Link funding sources where possible
- Write grant applications collaboratively.

ANTICIPATING THE CHALLENGES

How much funding do you need? When do you need it? How much will you need later?

The most prominent challenge in most people's minds is money. Although administrative funding is usually strained, outside funding for other activities is available through government agencies, professional and health associations, and private foundations. Many researchers and research administrators who could benefit from this support are unaware that they are eligible or do not know how to find it.

As you and your partner seek collaborative funding, you will want to identify your strengths, cover all costs, and develop a timeline for seeking and obtaining funds.

Match Your Strengths

RIIs and MSIs each have something to offer when it comes to getting funded.

RIIs generally have much more experience and better track records for grant writing than MSIs. They also generally have greater familiarity with and access to private foundations and health research organizations. By writing with an experienced partner, faculty and administrators at smaller, more teaching-oriented institutions gain skills and connections they can apply to develop and secure funds for future research projects.

Similarly, MSIs and traditionally minority institutions qualify for research supplements and minority-related training grants and programs that are often difficult for RIIs to obtain or participate in.

Cover All Costs

The costs of a research training partnership include support for:

- Core training activities
- Training-related support components.

Some training activities that are part of the normal academic portfolio (shared journal clubs, interinstitutional participation of faculty

on student thesis advisory committees) can be extended to a partnership at little or no cost. And, if they are not already under way, they can often be initiated under existing training program grants.

More complex activities, such as those involving student and faculty exchange, may require additional funds to cover the administrative expenses of running a partnership program, costs for travel and housing, faculty leave and replacement during sabbaticals or short-term training experiences, financial and other incentives for busy researchers to take on training activities, and facilities and equipment. As noted in the previous chapter, addressing these needs during the planning phase is important if you are going to set up a successful partnership. The funds to meet these needs can be covered by research training grants awarded to the partnership.

In addition to grant funding for core training activities, you will probably also need to ensure coverage of the following training-related support components:

- Mentorship training
- Supplemental enrichment and tutoring
- Grant writing and planning time
- Upgrades to laboratory facilities and equipment
- Curriculum development or enhancement
- Faculty recruitment
- Tracking and evaluation.

Develop a Timeline

Getting funded usually requires significant advance planning before activities are launched.

Include sufficient time in the planning process to identify funding sources and write grants. Estimate your time broadly to allow for the delays inherent in working collaboratively between institutions. Plan to spend several weeks or more identifying funding resources and developing a linking strategy with your partner. Once you identify funding sources, you will probably need at least a few months to write each grant and get it approved through your department and your research administrator's office.

Look for ways to streamline the approval process. Each jointly written grant will probably need to be reviewed by both institutions, and this review will add to your preparation time. Try to ensure that each grant does not get hung up in institutional review.

Consider applying for small "planning grants." These grants provide support for the partnership infrastructure before activities are implemented. They are offered by the NIH and other granting agencies and organizations to support the time you spend in planning and writing grant applications with your partner. They also are an integral part of many grants that support partnerships.

LEVERAGING RESOURCES STRATEGICALLY

The opportunity for leveraging resources is one of the most important aspects of partnership. You can stretch program dollars by combining existing institutional resources, identifying multiple sources of external support, and linking grants and programs to qualify for greater funding opportunities.

Share Institutional Resources

Take an inventory of the resources already available at each partner institution. In-kind trades with other departments can provide your trainees with facilities, tutorial and

support services, and other needs without incurring excessive costs for your program.

Share or trade resources creatively with other programs or departments at your institution and with your partner institution.

In exchange for your trainees' use of facilities or laboratory equipment in another department, for example, you might invite their students to participate in a special program seminar, demonstration, or workshop.

Share graduate student instructors and tutors for undergraduate students and trainees.

Create or tap into an interdepartmental work-study tutoring program in basic subjects (e.g., calculus, physics, chemistry, biology, statistics).

Consider sharing course materials, assignments, journal club presentations, poster presentations, and announcements over the Internet.

Bulletin boards, e-mail, and web sites are creating new possibilities for "distance learning"—access to instruction from a remote location—and are being used to share information and activities between partner institutions where frequent travel is not possible.

Some of the resources you could exchange or share are:

- Students
- Faculty
- Tutors for basic science and math courses
- Grant money (research grants and subcontracts, research and research training supplements, funds for faculty and facility enhancement)
- Facilities (labs, fieldwork opportunities)
- Information resources (libraries, databases, expertise)
- Community access (for population and clinical studies).

Coordinate External Funding

Writing grant applications together allows you and your partner to link your funding sources and qualify for more sources of support. To link your resources:

1. Sit down with your planning partner and list all existing and proposed grants available to support your programs. List both training and research grants.

2. Look for supplements to these grants. Does the agency or organization that supports these grants make supplements available for trainees, training activities, minority students, faculty retraining, etc.? If your principal investigators and participating faculty did not qualify for supplements to their research grants before, they may now if they take on partnership trainees in their laboratories. Supplements will be awarded to the institution that has the parent grant.

3. Ask granting organizations for help. The grant administrators at Federal agencies can tell you about a variety of grants your program may qualify for and can advise you on preparing applications to qualify for support. They can also provide lists of related opportunities offered by other agencies and private organizations.

4. Ask granting organizations to innovate. Most NRSA training program grants are awarded to a single institution with a single program director or principal investigator. However, this does not mean that the grants could not be configured to enlist faculty at two institutions and, therefore, put money into training activities at both. The NHLBI has helped an investigator create the first two-institution NRSA program between Vanderbilt University and Meharry Medical College (see Chapter 1).

5. Check application requirements carefully to avoid problems or conflicts. Some sources of funding may have requirements or restrictions that preclude combining them with other sources of support.

6. Check the timing of any grant applications you plan to link. Make sure deadlines and award dates are compatible with each other and with your schedule of activities.

Extend Your Range

Your program activities may qualify for support from more than one Institute at the NIH. In addition to the research grants and training opportunities offered by individual institutes in specific areas of biomedical and behavioral science, the NIH has a number of programs to support general and minority research training, equipment and facilities development, faculty development, and curriculum development. These programs are available through cross-cutting institutes and offices such as the National Institute of General Medical Sciences, the Office of Research on Minority Health, the Office of Research on Women's Health, and the National Center for Research Resources. Many of these opportunities are listed and described on the Internet (see Appendix B for addresses and web sites).

Your partnership program(s) may qualify for support from more than one agency. You may be able to obtain support not just from the NIH, but from a combination of Federal and state agencies, industry, and private organizations.

Think big—join forces with other departmental programs for umbrella funding. Many Federal agencies and private foundations are beginning to offer substantial awards for comprehensive interinstitutional partnerships. For example, some of the recent partnership awards from the Howard Hughes Medical Institute have run upwards of $500,000. One shared activity between individual principal investigators may not be enough to qualify under the terms of these grants, but department-wide programs with faculty and curriculum enhancement, in addition to bridge programs and other forms of recruitment, may attract enough support for all of the planned activities and then some. Of course, you should not stretch your partnership activities beyond your ability to implement them, but you could join your proposed collaborative partnership activities with other existing departmental and institutional efforts (e.g., faculty recruitment, minority recruitment, curriculum development) to qualify for large-scale support.

Make contact with national and regional minority organizations. These organizations include the National Association for the Advancement of Colored People (NAACP), the National Council of La Raza, the American Indian Science and Engineering Society (AISES), the National Medical Association, the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS), and the National Urban League. Many women's organizations also offer scholarships to women, grants to women researchers, and grants for women's health research that

may be useful for some aspects of your program activities or for some of your minority trainees.

PREPARING GRANT APPLICATIONS

Two ways to expedite your preparation of grant applications are to write collaboratively and to automate the application process. Some strategies are suggested below.

Write Collaboratively

Not only should you plan your grant funding strategy with your planning partner, you need to write the partnership grant applications together so that each of you has a stake in it, understands what is requested in each application, and can ensure that your institution's needs are met.

Coordinate your efforts.

You will not be sitting at the same table throughout every stage of grant writing, so make sure both of you know when each component is needed and who is going to write it.

Build in time for review.

Give each partner time to read the other partner's contributions and discuss changes. If the submitted grant application does not suit one of you, it may become a source of friction later and may detract from the partnership.

Use grant writing as a training tool for less-experienced faculty at both institutions.

The partnership is an opportunity to foster collaboration and coaching between participating faculty at both institutions. Have faculty from each institution collaborate in writing components of the grant application that can feed into the master plan (see Chapter 4 for more planning details).

Automate the Application Process

The grant application process can be a daunting task, particularly with Federal research and research training grants that require a number of components from the principal investigator and institution. RIIs typically have a systematized routine for collating application components and reviewing them in a streamlined way. Institutions that do not conduct much research, however, often do not have the experience or the grant "machine" in place to automate the application process, so each grant application is produced from scratch and can take more time to prepare than expected. This cumbersome process can inhibit MSI partner institutions from participating fully in grant writing.

If your institution or department does not have an efficient system in place, try these strategies to reduce the workload and time you need to prepare grant applications:

Create "boilerplate" text files on computer for the standard administrative sections of the application.

Much of the administrative information requested on grant application forms is standard and does not change much from application to application or from year to year. These files can be used repeatedly by anyone in the department, thereby freeing investigators to write only the technical sections describing their proposed research. The following sections can be created once (with occasional updates) in electronic

format and stored on computer in your department's administrative office for easy retrieval whenever a new application has to be submitted:

- Staff resumes and biographical sketches for all key personnel who might be listed on grant applications. Create an entry for each new person who joins the department. Store these entries in the formats requested by the agencies you apply to most frequently.
- Complete and keep up-to-date Representation and Certification forms and similar boilerplate information on file for quick and easy insertion into the application.
- A comprehensive capability and facilities and equipment statement in electronic format. Investigators can easily modify a copy of the document file to emphasize the skills, experiences, or equipment that are most relevant for the grant or contract they are applying for.

Go digital and use the Internet.

Everything for the grant application should be stored in electronic format, preferably in a standard wordprocessing format common to the department or institution. Standard printed forms should be available to principal investigators in electronic format as well.

E-mail or download files with standard administrative information from your institution's local area network or web site.

Many grant applications from Federal and private organizations use forms available through the Internet. Download and use these versions for quick and easy editing and to ensure that your proposal has a neat and uniform appearance.

Pay attention to the time.

Timing is everything. Meet with your budget staff and other key administrators to establish clear procedures for obtaining appropriate clearance and signatures on the grant application. Discuss the possibility of submitting a near-final draft of the technical proposal with the business proposal when the technical and business proposals are submitted for internal review and clearance. The principal investigator will then have more time to devote to preparing the technical proposal and the administrators will get extra time to review the application.

Designate one or more individuals in the department with proposal writing experience to be responsible for editing and reviewing the request for applications to ensure that all of the information needed to be responsive to the request is included in your application.

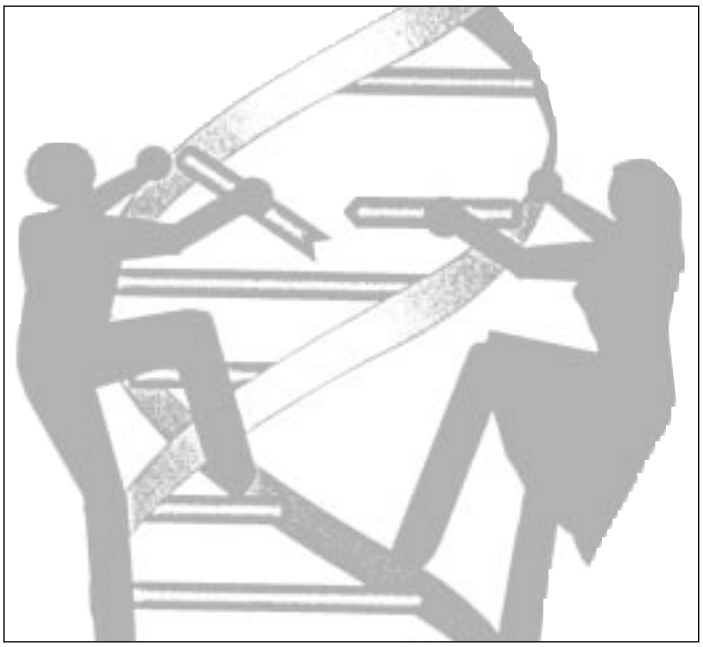
The components of many applications are the same. If these sections are prepared, reviewed, and approved by the appropriate individuals, and if they are maintained in electronic form, they can be modified quickly to be responsive to a specific request for applications, thereby reducing substantially the amount of time required to prepare and review a proposal.

You are now ready to set your partnership in motion. In the next chapter, you will learn techniques for recruiting and selecting trainees and for tracking and evaluating your program.

CHAPTER 7

7

Implementing and Maintaining the Partnership



IMPLEMENTING AND MAINTAINING THE PARTNERSHIP

RECRUITING TRAINEES
- Expand Your Search
- Promote Training Opportunities

SELECTING AND PLACING TRAINEES
- Select Trainees Cooperatively
- Establish Trainee Selection Criteria

EVALUATING THE TRAINING PROGRAM
- Plan Continuous Evaluations
- Select Program Evaluation Criteria

SETTING UP A TRACKING SYSTEM
- Develop a Tracking Plan
- Use the Tracking System Strategically

CHAPTER 7

Implementing and Maintaining the Partnership

Two essential components for implementing and maintaining an effective research training partnership are:

- Recruiting and selecting trainees who are interested in biomedical and behavioral science and research
- Evaluating the training activities and tracking participants systematically and continuously.

Both of these components should reflect the goals of the partnership and the partner institutions, and your written agreement should convey how you will carry out these activities collaboratively.

Recruiting Trainees

Estimating the pool of underrepresented minority candidates available for recruitment into research training is difficult because many of the students who might have the potential for research are unidentified by teachers or do not recognize research as a real-life opportunity for them. Current estimates put the number at only a few thousand candidates nationally per year, and most of those are likely to attend medical school rather than graduate school.

However, Howard Hughes Medical Institute (HHMI), a privately funded research foundation, reported in 1996 that among 28,000 graduate students participating in its internships and courses, about 4,000 were from underrepresented minority groups. Clearly, if these numbers are correct, the pool of motivated and qualified minority students cannot be as small as most mainstream universities have assumed from their recruiting experience.

As with the other planning and coordination activities in this guide, recruitment within the context of a partnership is a joint effort. Working cooperatively should make some aspects of recruitment easier (e.g., identifying the pool of potential trainees), but there are always obstacles. Keep in mind that although some tasks can be carried out separately once you and your partner have agreed on a strategy, whatever happens during recruitment affects both institutions.

A general plan for recruiting minority trainees into research training activities might look like this:

1. Identify the appropriate trainee pool and determine how many trainees you need for your activities.

2. Agree on necessary trainee qualifications, ways to handle referrals, and selection criteria. Find mentors for the trainees.

3. Decide who will recruit, who will select candidates, and who will be the main contact for trainees during the program. Minority individuals should be included in the recruitment process if at all possible. Set a schedule for recruitment and selection far enough in advance of the planned activity.

4. Provide funds for advertising, site visits, counseling, lodging and travel, and incentives.

5. Strategize with minority affairs, admissions, and deans' offices; granting agencies; and student, professional, and community organizations to capitalize on existing recruitment resources.

6. Recruit or select trainees and match them with mentors.

7. Talk with trainees before, during, and after the training activity to assess needs, problems, overall value, areas of improvement, and potential for building a research career.

8. Use a tracking system to follow trainees during and after their participation in the program.

9. Evaluate minority recruitment and retention with your partner, including both the numbers of trainees you have recruited and retained in a research career and any factors influencing these numbers in your program.

You can improve your ability to recruit minority trainees for the partnership by expanding your search for potential candidates and promoting your training opportunities to them.

Expand Your Search

In a collaborative partnership between an RII and an MSI, some of the pipeline issues are addressed directly through joint activities. It is assumed that the MSI will actively promote its students' participation in the program and therefore guarantee that a certain number of them will become trainees. However, you may both want to consider additional sources of potential trainees who could be recruited. Some strategies to try:

Identify minority students with interest in biomedical and behavioral science at an earlier stage.

Many educational partnership programs, including those supported by the NSF, the Association of American Medical Colleges (AAMC), biomedical research companies, and large private foundations such as HHMI, focus on increasing student interest in the sciences through partnerships between graduate institutions and local high schools. Considerable information about these programs is available on the Internet. The NSF, AAMC, and HHMI also maintain extensive databases on recruitment, admissions, matriculation, retention, academic and standard test scores, and career paths for underrepresented minority groups throughout the country.

Look for undergraduate students at both partner institutions whether or not they are science majors.

Graduate departments at RIIs sometimes overlook the pool of potential minority trainees in their own undergraduate programs. All institutions tend to overlook the potential of nonscience or nonbiology majors and engineering students to participate in biomedical or behavioral research training and careers. Humanities and social science majors may never have considered themselves capable of a research career, but if motivated—for example, through a hands-on summer internship or workshop—and given clear advice on what science and math courses they would need to make up, they

can become eligible for graduate and professional school programs in biomedical and behavioral sciences. Many premed students major in humanities to offset what they consider a monolithic future in science studies, and many chemistry, physics, and engineering students, who have the mathematics training for upper-level science courses, may be interested in applying their skills to biomedicine.

Look at local 2-year and community colleges.

General demographic data on higher education show that community and junior colleges are the major post-high school source of education for most underrepresented minority groups. Many of the tribal colleges fall into this category, and community colleges in metropolitan areas also tend to have a large concentration of minority students. Creating a bridge between local community or 2-year colleges and the partner institutions is one way to increase the pool of motivated minority trainees for both partner institutions.

Look for older students.

Many colleges and universities are seeing an upward swing in matriculation of older students—people who go to earn their baccalaureate degrees after several years in the workforce. More minority students than whites matriculate this way. These students are generally better grounded and more motivated than younger students, and they often begin with the intention of earning only a single degree to secure a better job. Paid research opportunities and encouragement to consider a research career path may attract older students who have a high potential for success.

Promote Training Opportunities

Besides expanding your search for trainees, you also can actively promote your partnership's opportunities for research training.

Present your program at meetings.

Promote your partnership's research training opportunities at regional and national meetings of minority student and professional organizations such as the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS), the American Indian Science and Engineering Society (AISES), and the Student National Medical Association. Biomedical symposia sponsored by the National Institute of General Medical Sciences for its Minority Access to Research Careers (MARC) and Minority Biomedical Research Support (MBRS) programs are also good places for marketing your program. The minority-serving partner institution may already have representation at some of these meetings, as may the minority affairs and admissions/recruiting offices of the RII.

Make the most of meetings.

Exhibit. A booth with information on your partnership's program activities can attract numerous potential trainees in a short period of time. Take addresses from as many as you can, and maintain contact with them. Those who do not become participants early on may remember you at a later stage of training and in the meantime may pass on your information to their friends.

Present. You can often get a spokesperson for your partnership listed on the program, particularly at student association meetings. During the talk, instead of focusing on just

one program activity, walk the attendees through several programs offered by your partnership institutions and show them how these opportunities for research training can support their education and help them build professional careers.

Network. Meet as many faculty members from other institutions as possible. These contacts may enable your partnership to expand opportunities for your trainees, offer training to interested students and faculty from institutions outside the partnership, and tap a source of possible faculty recruitment for your institutions.

Use the internal publications (e.g., newsletters, alumni magazines) and Internet home pages of your institutions to promote visibility for partnership activities and accomplishments.

Promote your partnership programs at career days.

Career days and similar events at undergraduate institutions are good places to look for potential trainees and to raise awareness of research as a rewarding and prestigious career option. Discuss graduate-level programs and summer research experiences with undergraduates. Attend several years in a row. Try to meet with students in their junior year so that they will have the opportunity to prepare for and take the GRE or MCAT entrance tests and get a successful score before the graduate program admission deadlines.

Approach local high schools.

Although forging active partnerships with high schools is beyond the scope of this guide, it is worthwhile to find out whether your institutions, another institution in the area, or a business or industry have such a program with local high schools. If so, the program may be a good forum for cultivating prospective minority undergraduate science majors, offering information on biomedical and behavioral research careers, and recruiting trainees for your institution's summer enrichment programs.

SELECTING AND PLACING TRAINEES

Two issues you and your partner will want to address next are: who selects the trainees, and what are the criteria for selection.

Select Trainees Cooperatively

Ordinarily, an institution that hosts or provides a training activity would set its own selection criteria and select trainees unilaterally. In a partnership, however, the selection of trainees must be agreed on cooperatively. These decisions should reflect your agreement on selection criteria identified during the planning stage. Generally,

- For shared activities, each institution selects its own trainees.
- For summer internships, faculty training, and some bridge programs, the home institution may take the lead in selecting or recommending trainees to the host institution.
- For student exchange programs, faculty sabbaticals, and research collaborations, trainees may be self-selected but need to be approved by both institutions.

Establish Trainee Selection Criteria

Many RIIs admit students primarily on the basis of standardized tests such as the GRE, but after controlling for other variables, average minority student scores on these tests are still lower than those of the majority population. Standardized testing provides ease of comparison between candidates and legal defensibility for admissions, but it does not predict a candidate's ability to conceive and perform independent research projects. Selecting trainees for a research training partnership requires some rethinking of the standard admission criteria.

Use selection criteria developed specifically for the training activity.

Different activities and research areas demand different preparatory skills, background knowledge, and aptitudes. The training you provide can have a greater effect and enhance your overall program if you weigh the prerequisites and requirements for each activity separately.

Credit the candidate's record.

By including practical indicators of performance in your selection criteria, you can increase the effectiveness of minority recruitment and ensure that all the students who are selected are well-qualified for graduate research. Important indicators include:

Recommendations from professors at the undergraduate partner institution. These professors are familiar with the candidates' day-to-day performance.

Candidates' hands-on research experience at a host RII prior to matriculation. The content of a previous research training experience, and a candidate's response to this experience, are good indicators of potential success in your planned activity.

Prior participation in shared courses on research topics and in student exchange programs. A candidate's participation in these activities indicates motivation.

Consider a candidate's noncognitive strengths.

Some alternate admissions criteria suggested by the AAMC as predictors of minority trainees' success in medical school include the following:

- Leadership
- Realistic self-appraisal
- Determination and motivation
- Family and community support
- Social interest
- Maturity and coping capability
- Communication skills.

With the exception of family and community support and communication skills, none of these criteria is concrete enough to uncover in a short interview with a prospective trainee. If you decide to use these criteria, you and your partner should agree on practical measures for determining them.

EVALUATING THE TRAINING PROGRAM

Any planned program or activity should have at least one concrete and achievable objective with some built-in measures for evaluation. Large national organizations such as United Way of America have examined the issue of timing to get the most out of evaluations for their volunteers. They divide evaluation into two categories that have different approaches and uses:

- Long-term outcomes evaluation, a final analysis of the program's effectiveness
- Continuing evaluations, conducted during the course of a program so that improvements can be made in the short term.

Long-term outcomes evaluations of overall partnership performance are likely to be more expensive and difficult to conduct. These are better suited to clusters of activities rather than to single programs and should be conducted only when needed to guide major decisions affecting the direction of the partnership as a whole. These analyses are generally developed with the help of a trainee tracking system (see the next section).

A continuing evaluation process consists of short, targeted evaluations at several intermediate stages of the partnership and individual activities. It is relatively inexpensive to conduct and it will promote flexibility and help you improve your activity and partnership designs rapidly as you respond to unanticipated events and outcomes. Coordinators for the partnership should design and conduct evaluations together, sharing information collected separately at regular intervals during and after each activity.

Plan Continuous Evaluations

A continuing evaluation for a collaborative partnership might be conducted in the following stages:

1. Have coordinators and activity leaders from both institutions meet to decide what needs to be learned from each activity to evaluate the partnership's effectiveness. Agree on acceptable and unacceptable outcomes for each activity and for the overall partnership.

2. Choose measurable and meaningful criteria to assess the effectiveness of recruitment strategies for each activity and for the overall partnership.

3. Use exit questionnaires, faculty debriefings, and similar tools to evaluate at the end of each activity or round of activities (e.g., each semester of a course). Assess retention, fulfillment of training goals, trainees' acquisition of new skills and knowledge, quality of mentorship, faculty participation levels, and perceived overall value and relevance to trainees along the career path.

4. Evaluate management and coordination of the partnership at regular intervals. Examine duplication of effort, gaps in communication, balance of power and participation, and balance of benefits and burdens.

5. Evaluate administrative, facility, and logistical problems and successes and identify ways to improve the program.

6. Assess your funding strategies. Look at adequacy of funding, stability of resources for future use, effectiveness of linked awards, and opportunities for improvement.

Select Program Evaluation Criteria

Think strategically when you are ready to select your evaluation criteria.

Use multiple criteria (short-term and long-term outcomes, quantitative and qualitative measures) to balance the evaluation.

If an activity is required of all students in a training program or department at both institutions, attendance is fixed. The success of the activity therefore should probably be evaluated not by the students' attendance but by some measure of its actual value to the trainees (e.g., a long-term outcome such as a change in performance or approach to their work).

For special guest lectures, attendance is often the most measurable parameter, but question-and-answer sessions and exit questionnaires can indicate the value of the lecture to students.

For a joint seminar or journal club, good grades, active participation, and retention are easily measured outcomes, but increased and more effective use of science library resources and informal awards of "best paper presentation," or the like, are important qualitative signs of success.

Be realistic, not idealistic.

Use caution when projecting numbers for attendance, participation, grade breakdowns, recruitment of students, and so on. Setting expectations at 100 percent means that even if all possible students attend all the lectures for a course and earn 4.0 grade point averages—an unlikely scenario at the best of times—the activity has only just met its criteria and cannot possibly exceed them. On the other hand, setting expectations too low absolves those involved from working to ensure good attendance, retention, participation, and achievement.

Estimate the time needed to see results from a given activity. Optional activities such as student exchange or summer internships may require several semesters or quarters of publicity and word-of-mouth efforts to develop a steady stream of participants.

SETTING UP A TRACKING SYSTEM

Tracking is a significant activity for evaluating the long-term impact of a collaborative research training partnership. A well-constructed tracking system provides a number of important benefits for the partnership and for each partner institution. The benefits include:

- Assessment of a pipeline program's overall effectiveness and identification of elements that contribute to a trainee's future success
- Encouragement of trainees, particularly undergraduate students, to think of research as attainable by showing them what previous trainees have achieved
- Establishment of a partner institution's reputation for successful placement of graduates in well-regarded graduate programs or professions—a strong plus for attracting new trainees and faculty and for increasing alumni contributions

- Continued contact with former trainees to offer possible future training opportunities or to attract them to faculty positions.

Develop a Tracking Plan

What should you include?

Every institution or partnership program carries out tracking somewhat differently, but the basic requirements are:

- A database, which can be as low-tech as a drawer of participant files or as high-tech as a turnkey computerized tracking system
- A systematic plan for followup and communication with former trainees.

Your department or institution has existing tracking systems that you might use as a model for following up with trainees. These include the alumni tracking system for the institution and grants administration databases for grants requiring payback.

At a minimum, your tracking plan should collect the following data for each trainee:

- *Identifying information.* Name, date of birth, social security number, race/ethnicity, gender, home and academic addresses with telephone and fax numbers, e-mail address.
- *Academic information.* Major or concentration, degree obtained and/or pursuing with year obtained or expected, education level, grade point average, participation in academic enrichment programs, academic awards attributed to partnership participation, and future academic and training plans.
- *Research training and experience.* Laboratory experience, attendance at and participation in scientific meetings, presentations, publications, and specialized training or certification.
- *Statement of career goals.* The trainee's written or verbal communication on his or her goals, specifically those that are relevant to a biomedical or behavioral research career.
- *Employment information.* Present and past jobs.
- *Trainee or faculty assessment of training.* Statement of the impact of the partnership program and activity on the trainee's career success. Include followup information to assess long-range outcomes such as changes in approach to teaching, scholarly productivity, tenure, and so on.
- *Faculty participant information.* Length of participation in the partnership program and training activities, list of activities, benefits of activities, and faculty and trainees' recommendations for program improvements.
- *Additional information.* Other data specific to the activity or program being evaluated.

Use the Tracking System Strategically

With your tracking plan in hand, you can develop the system you need to follow your trainees and evaluate your program. Here are the steps:

1. Collect baseline and followup data.

   Collect baseline data on participants and, if you have access to it, similar individuals

who are pursuing research careers but did not participate in the partnership activities. These data will help you make within- and across-group comparisons. Individuals who participated in the program should be contacted periodically to obtain updated information and to monitor their progress. This information should be analyzed to determine whether the participants:

- Are pursuing a career in research
- Have been able to obtain work in their field
- Are making scientific contributions.

2. Assess the benefits of participating in the program.

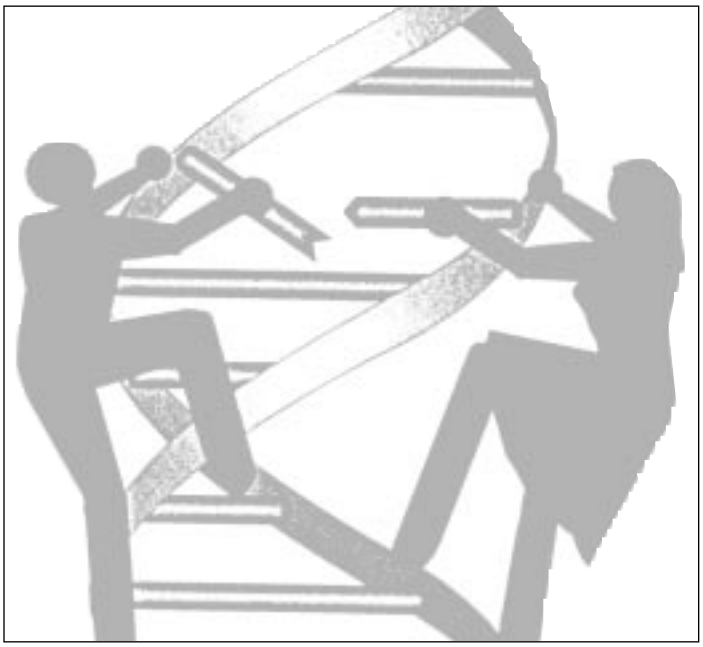
   Participants should be compared with non-participants who have similar career goals to determine if there is a significant difference in the two groups in areas such as:

   - The amount of time required to obtain a degree
   - Employability
   - Publication rates.

3. Use the results to improve your program.

   If your partnership programs are providing long-term career benefits for your trainees, use that information to promote the partnership and your institutions to incoming students, university administrators, grant administrators, and the community at large.

   If your partnership activities are not providing the expected long-term benefit, rethink them with your planning partner. Look for areas where they may be strengthened or reshaped to achieve your goals.



APPENDIXES

APPENDIX A

Reports and Articles

Association of American Medical Colleges
2450 N Street, N.W.
Washington, DC 20037-1123
202-828-0416/fax 202-828-1125 or 202-828-1123
http://www.aamc.org

- Project 3000 by 2000 Technical Assistance Manual: Guidelines for Action. 1992.
  http://aamcinfo.aamc.org/meded/minority/3x2/

American Council on Education
Office of Minorities in Higher Education
One Dupont Circle, N.W.
Washington, DC 20036
202-939-9395/fax 202-785-8056
http://www.acenet.edu

- Minorities in Higher Education, 15th Annual Status Report. 1997.
  http://www.acenet.edu/Programs/OMHE/StatusReport.html

The Council of Graduate Schools
One Dupont Circle N.W., Suite 430
Washington, D.C. 20036-1173
202-223-3791/fax 202-331-7157
http://www.cgsnet.org

- "Enhancing the Minority Presence in Graduate Education" series.
  http://www.cgsnet.org/EMPS.htm

Howard Hughes Medical Institute
4000 Jones Bridge Road
Chevy Chase, MD 20815-6789
301-215-8500/fax 301-215-8888
http://www.hhmi.org

- Institutional Strategies for Enhancing Undergraduate Science Education. 1994.

- Meeting the Challenges of Science Education Reform. 1996.

- HHMI Beyond Biology 101: The Transformation of Undergraduate Biology Education.
  http://www.hhmi.org/BeyondBio101/world.htm

National Academy of Sciences/National Research Council
National Academy Press
2101 Constitution Avenue, N.W., Box 385
Washington, DC 20055
800-624-6242/202-334-3313/fax 202-334-2451
E-mail AMerchan@NAS.edu

- Meeting the Nation's Needs for Biomedical and Behavioral Scientists. 1994.

- Balancing the Scales of Opportunity: Ensuring Racial and Ethnic Diversity in the Health Professions. 1994.
  http://www.nap.edu/readingroom/enter2.cgi?0309050782.html

- Careers in Science and Engineering: A Student Planning Guide to Grad School and Beyond. 1996.
  http://www.nap.edu/readingroom/books/careers/

NIH National Heart, Lung, and Blood Institute
Building 31, Room 5A07
31 Center Drive, MSC 2482
Bethesda, MD 20892
301-402-3421/fax 301-402-1056
http://www.nhlbi.nih.gov/nhlbi/nhlbi.htm

- "Improving Ethnic Diversity in Research Training Programs," by Stephen M. Schwartz and Barbara F. James. *The FASEB Journal*. November 1994, vol. 8, pp. 1105-1109.

- Report of the Working Group on Minority Recruitment into Institutional NRSA Training Programs. 1993.
  Available from: NHLBI Information Center, P.O. Box 30105, Bethesda, MD 20824-0105, fax 301-251-1223.

NIH Office of Research on Minority Health
Building 1, Room 260
9000 Wisconsin Avenue
Bethesda, MD 20892-0164
301-402-2515/ fax 301-402-2517
E-mail johnruffin@nih.gov

- Report of the National Conference on Minority Health Research and Research Training. 1994.

National Science Foundation
4201 Wilson Boulevard
Arlington, VA 22230
703-306-1234/ TDD 703-306-0090
http://www.nsf.gov/

- Science & Engineering Indicators—1996.
  http://www.nsf.gov/sbe/srs/seind96/startse.htm

- Shaping the Future: New Expectations for Undergraduate Education in Science, Mathematics, Engineering, and Technology. 1996.
  http://www.ehr.nsf.gov/ehr/due/documents/review/96139/start.htm

Texas Academic Skills Program
Texas Higher Education Coordinating Board
Universities Division—TASP Office
P.O. Box 12788
Austin, TX 78711-2788
210-733-2360/fax 210-733-2204
E-mail Kennedycy@thecb.state.tx.us

- Texas Academic Skills Program: Annual Report on the TASP and the Effectiveness of Remediation. July 1996.
  http://www.thecb.state.tx.us/divisions/univ/tasp/annrpt96/ar96main.htm

APPENDIX B

Federal Research Training Resources

Department of Health and Human Services
Office of Minority Health
http://www.os.dhhs.gov/progorg/ophs/omh/

- Office of Minority Health Resource Center
  http://www.omhrc.gov/

Federal Information Exchange Minority On-Line Information Service (MOLIS)
http://web.fie.com/web/mol/

Indian Health Service
http://www.tucson.ihs.gov/

- Scholarship Program
  Twinbrook Metro Plaza - Suite 100
  12300 Twinbrook Parkway
  Rockville, MD 20852
  301-443-6197/fax 301-443-6048
  http://www.tucson.ihs.gov/scholarloan/Schlarsp.html

National Institutes of Health
http://www.nih.gov

- NIH Office of Extramural Research (OER) Grants
  http://www.nih.gov/grants/sitemap.htm
- NIH Research Training and Career Development Programs
  http://www.nih.gov/grants/training/training.htm
- NIH Equal Opportunity Officers' Home Page
  http://www.ninds.nih.gov/icdeeoofficers/
- NIH Black Scientist Association
  http://www.nih.gov:80/science/blacksci/

National Center for Research Resources (NCRR)
http://www.ncrr.nih.gov/

- Research Infrastructure Mechanisms: Research Centers in Minority Institutions (RCMI) Program; The RCMI Clinical Research Infrastructure Initiative; Research Infrastructure in Minority Institutions; Minority Initiative: K-12 Teachers and High School Students; Science Education Partnership Award; Institutional Development Award; Research Facilities Improvement Program
  http://www.ncrr.nih.gov/resinfra.htm

National Institute of General Medical Sciences
http://www.nih.gov/nigms/

- Division of Minority Opportunities in Research
  National Institute of General Medical Sciences
  45 Center Drive, MSC 6200
  Bethesda, MD 20892-6200
  301-594-3900/fax 301-480-2753
  http://www.nih.gov/nigms/about_nigms/more.html
- Special Research Training Programs
  http://www.nih.gov/nigms/ funding_info/ grntprog.html

National Heart, Lung, and Blood Institute
Training and Career Development Programs
Minority Coordinator
National Heart, Lung, and Blood Institute
Building 31, Room 5A07
31 Center Drive, MSC 2482
Bethesda, MD 20892-2482
301-402-3421/fax 301-402-1056
E-mail jamesb@gwgate.nhlbi.nih.gov

- Directory of Minority-Serving Institutions. 1996.

- Selected Non-Federal Sources of Research Support. 1994.

- NHLBI Research Training and Career Development Programs. Revised 1996.
  http://www.nhlbi.nih.gov/nhlbi/train/redbook/red-hmpg.htm

- NHLBI-Supported National Research Service Award (NRSA) Training Programs. 1996.
  http://www.nhlbi.nih.gov/nhlbi/train/nrsa_abt.htm

NIH Office of Research on Minority Health
Building 1, Room 260
9000 Wisconsin Avenue
Bethesda, MD 20892-0164
301-402-2515/ fax 301-402-2517
E-mail johnruffin@nih.gov

National Science Foundation (NSF)
4201 Wilson Boulevard
Arlington, VA 22230
703-306-1234/ TDD 703-306-0090
http://www.nsf.gov

APPENDIX C

Organizations

MINORITY ORGANIZATIONS

Black Organizations

Association of Minority Health Professional Schools (AMHPS)
c/o Dale P. Dirks
507 Capitol Court, N.E., Suite 200
Washington, DC 20002
202-544-7499/fax 202-546-7105
http://svmc107.tusk.edu/amphs2.html

Beta Kappa Chi National Science Honor Society
http://www.cnrt.scsu.edu/sets/org/BETAKX.HTM

National Association for the Advancement of Colored People (NAACP)
4805 Mt. Hope Drive
Baltimore, MD 21215-3297
410-358-8900/410-358-3818
http://www.naacp.org/index.html

National Association for Equal Opportunity in Higher Education (NAFEO)
400 12th Street, N.E.
Washington, DC 20002
202-543-9111/fax 202-543-9113 or 202-544-8564
E-mail pkford@sfwnet.com

National Medical Association (NMA)
1012 10th Street, N.W.
Washington, DC 20001
202-347-1895/fax 202-842-3293
http://www.natmed.org/index.html

National Urban Coalition
1875 Connecticut Avenue, N.W.
Washington, DC 20009
202-986-1460 /fax 202-986-1468
http://www.ncl.org/anr/partners/nucoal.htm

National Urban League
500 E. 62nd Street
New York, NY 10021
212-558-5300/fax 212-344-5332
http://www.nul.org

Student National Medical Association (SNMA)
1012 10th Street, N.W.
Washington, DC 20001
800-636-SNMA/ 202-371-1616/fax 202-371-5676
E-mail snma@smart.net
http://www.hsc.missouri.edu/som/snma

Hispanic Organizations

ASPIRA Association
1444 I Street, N.W., Suite 800
Washington, DC 20005
202-835-3600/fax 202-835-3613

National Coalition of Hispanic Health and Human Services Organizations (COSSMHO)
1501 16th Street, N.W.
Washington, DC 20036
202-387-5000/fax 202-797-4353
E-mail info@cossmho.org
http://www.cossmho.org

National Council of La Raza (NCLR)
1111 19th Street, N.W., Suite 1000
Washington, DC 20036
202-785-1670/fax 202-776-1792
http://www.nclr.com

Society for the Advancement of Chicanos and
Native Americans in Science (SACNAS)
University of California
1156 High Street
Santa Cruz, CA 95064
408-459-4272/fax 408-459-3156
E-mail sacnas@cats.ucsc.edu
http://www.sacnas.org

American Indian and Alaska Native Organizations

Association of American Indian Physicians (AAIP)
1235 Sovereign Row, Suite C-7
Oklahoma City, OK 73108
405-946-7072/ fax 405-946-7651
E-mail aaip@ionet.net
http://www.ionet.net/~aaip

American Indian Higher Education Consortium (AIHEC)
121 Oronoco Street
Alexandria, VA 22314
703-838-0400/fax 703-838-0388
E-mail aihec@aol.com

American Indian Science and Engineering Society (AISES)
5661 Airport Boulevard
Boulder, CO 80301-2339
303-939-0023/fax 303-939-8150
E-mail AISESHQ@spot.colorado.eduAISES
http://www.Colorado.EDU/AISES

- AISESnet
  http://aises.uthscsa.edu/aisesnet.html

WOMEN'S ORGANIZATIONS IN SCIENCE AND MEDICINE

American Association of University Women (AAUW)
1111 16th Street N.W.
Washington, DC 20036
202-785-7700/ fax 202-872-1425/TDD 202-785-7777
E-mail info@mail.aauw.org
http://www.aauw.org

Association of Women in Science (AWIS)
1200 New York Avenue, N.W., Suite 650
Washington, DC 20005
202-326-8940/ fax 202-326-8960
E-mail awis@awis.org
http://www.awis.org

ORGANIZATIONS OFFERING GRANTS IN BIOMEDICAL RESEARCH

American Association for the Advancement of Science (AAAS)
1200 New York Avenue, N.W.
Washington, DC 20005
202-326-6400/fax 202-289-4950
http://www.aaas.org

Association of American Medical Colleges (AAMC)
2450 N Street, N.W.
Washington, DC 20037-1129
202-828-0416/fax 202-828-1123
http://www.aamc.org

- AAMC Community and Minority Programs: National Network for Health Science Partnerships
  http://www.aamc.org/meded/minority/nnhspa/start.htm

- Project 3000 x 2000 / Health Professions Partnership Initiative (HPPI)
  http://www.aamc.org/meded/minority/3x2/start.htm

American Chemical Society (ACS)
1155 16th Street, N.W.
Washington, DC 20036
202-872-4600
http://www.acs.org/welcome.htm

- Education Division
  http://www.acs.org/edugen2/education/aboutedu.htm

- Department of Minority Affairs
  fax 202-776-8003
  http://www.acs.org/pafgen/minority/maintro.htm

Howard Hughes Medical Institute
4000 Jones Bridge Road
Chevy Chase, MD 20815-6789
301-215-8500/fax 301-215-8888
http://www.hhmi.org

- Office of Grants and Special Programs
  http://www.hhmi.org/grants/pubs.htm

Robert Wood Johnson Foundation
Office of Proposal Management
P.O. Box 2316
Princeton, NJ 08543-2316
609-452-8701/fax 609-987-8845
http://www.rwjf.org

- Directory of National Program Offices
  http://www.rwjf.org/nation/npo96.htm

APPENDIX D

Partnership Resources by Subject

Distance Learning Resources

Howard University
2400 6th Street, N.W.
Washington, DC 20059
http://www.howard.edu

- Distance Learning Laboratory (DLL)
  http://stargate.con-ed.howard.edu/dl.htm

University of Colorado at Boulder
Boulder, CO 80309
http://www.colorado.edu

- Distance Learning
  http://www.Colorado.EDU/UCB/AcademicAffairs/Business/infs/jcb/sinewave/service/distance/

University of Wisconsin-Extension
432 N. Lake Street
Madison, WI 53706
608-262-3786/fax 608-262-6572
http://www.uwex.edu

- Distance Education Clearinghouse
  http://www.uwex.edu/disted/home.html
- Interactive Delivery Systems
  http://www.uwex.edu/disted/interactive.html

Evaluation Resources

Grantmakers Evaluation Network
Hogg Foundation
P.O. Box 7998
Austin, TX 78713
http://hogg1.lac.utexas.edu/gen/

- GEN Newsletter (on-line and downloadable formats)

Handbook of Practical Program Evaluation,
by Joseph S. Wholey, Harry Hatry, and Kathryn E. Newcomer, eds. Jossey-Bass: San Francisco, 1994.

National Science Foundation

- User-Friendly Handbook for Project Evaluation
  http://www.ehr.nsf.gov/EHR/RED/EVAL/handbook/handbook.htm

United Way of America
701 N. Fairfax Street
Alexandria, VA 22314-2045
800-772-0008/ 703-683-7830
http://www.unitedway.org

- Focusing on Program Outcomes:
  A Guide for United Ways
- Resource Network on Outcome Measurement
  http://www.unitedway.org/outcomes/
- Measuring Program Outcomes:
  A Practical Approach
  E-mail martha.greenway@uwa.unitedway.org

W. K. Kellogg Foundation
One Michigan Avenue East
Battle Creek, MI 49017-4058
616-968-1611/fax 616-968-0413
http://www.wkkf.org/

- Cluster Evaluation: Model of Evolving Practices. 1995.

FUNDING AND GRANT WRITING RESOURCES

California Institute of Technology
Fellowships Advising and Resource Office
1200 East California Boulevard
Pasadena, CA 91125
626-395-6811/fax 626-577-0636
http://www.caltech.edu

- Alphabetical List of Fellowships
  http://www.cco.caltech.edu/%7Elstolper/fellowship.list.html

Community of Science Funding Opportunities Home Page
http://cos.gdb.org/repos/fund

Grantmaker Information Table of Contents
http://fdncenter.org/grantmaker/contents.html

National Jewish Medical and Research Center
1400 Jackson Street
Denver, CO 80206
303-388-4461/fax 303-398-1663
http://www.njc.org

- Funding Resources on the Web
  http://www.njc.org/LIBRhtml/Grants_info.html

Pennsylvania State University
Office of Sponsored Programs
110 Technology Center
University Park, PA 16802-7000
814-865-0453/fax 814-865-3377

- Faculty Guide to Sponsored Programs
  http://infoserv.rttonet.psu.edu/spa/fac-guid.htm

Sponsored Program Information Network (SPIN)
http://www.infoed.org/

State University of New York Research Foundation
Faculty Scholarships & Grants
http://www.potsdam.edu/FSG/FSGhome.html

U.S. Department of Energy Carlsbad Area Office (DOE/CAO) Grant Writing Course
http://www.uwex.edu/disted/usdoecao.htm

HIGH SCHOOL TO HIGHER EDUCATION

Association of American Medical Colleges

- AAMC Community and Minority Programs: National Network for Health Science Partnerships
  http://www.aamc.org/meded/minority/nnhspa/start.htm

Boston University School of Medicine

- CityLab: A Biotechnology Learning Laboratory for Students and their Teachers
  http://Med-www.bu.edu/gms/CityLab/

Los Angeles Educational Partnership (LAEP)

- Partners in Science and Industry
  http://www.lalc.k12.ca.us/laep/smart/parthome.html

MENTORSHIP RESOURCES

Association of Women in Science (AWIS)
http://www.awis.org/html/awis_publications.html

- Mentoring Means Future Scientists: A Guide to Developing Mentoring Programs Based on the AWIS Mentoring Program.
- A HAND UP: Women Mentoring Women in Science. 1995.

Harvard Medical School Faculty Development and Diversity Program
25 Shattuck Street, A-151
Boston, MA 02115
617-432-1061/fax 617-432-1224
http://www.med.harvard.edu/programs/fdd

Mertz, N., et al. Executive Mentoring: Myths, Issues, Strategies. University of Tennessee Press, 1990.

National Academy of Sciences
National Academy Press
2101 Constitution Avenue, N.W., Box 385
Washington, DC 20055
800-624-6242/202-334-3313/fax 202-334-2451

- Adviser, Teacher, Role Model, Friend: On Being a Mentor to Students in Science and Engineering. 1997.
  http://www.nap.edu/readingroom/books/mentor/

One to One/The National Mentoring Partnership
2801 M Street, N.W.
Washington, DC 20007
202-338-3844/fax 202-338-1642
http://www.mentoring.org

- Best Practices. Mentoring: Elements of Effective Practice. 1991.
  http://www.mentoring.org/bestpractices.html
- Mentoring Diagnostic
  http://www.mentoring.org/diagscen.html
- National Mentoring Technical Assistance (TAC) Directory
  http://www.mentoring.org/NMPTAC.html

STUDENT SCIENCE CAREER RESOURCES

American Association for the Advancement of Science

- Science's Next Wave Online Magazine
  http://www.nextwave.org

National Academy of Sciences

- A Career Planning Center for Beginning Scientists and Engineers
  http://www2.nas.edu/cpc/index.html

SUPPLEMENTAL EDUCATION PROGRAMS

Texas Academic Skills Program

- TASP Faculty Manual
  http://www.tasp.nesinc.com/fac_toc.htm

APPENDIX E

National Heart, Lung, and Blood Institute Contacts for Research Training

Barbara James, M.P.H.
Minority Coordinator
National Heart, Lung, and Blood Institute
Building 31, Room 5A07
31 Center Drive, MSC 2482
Bethesda, MD 20892
301-402-3421/fax 301-402-1056
E-mail jamesb@gwgate.nhlbi.nih.gov

Michael Commarato, Ph.D.
Division of Heart and Vascular Diseases
National Heart, Lung, and Blood Institute
Two Rockledge Center, Room 9204
Bethesda, MD 20892
301-435-0527/fax 301-480-1454
E-mail commaram@gwgate.nhlbi.nih.gov

Beth Schucker, M.A.
Division of Heart and Vascular Diseases
National Heart, Lung, and Blood Institute
Two Rockledge Center, Room 9204
6701 Rockledge Drive, MSC 7956
Bethesda, MD 20892
301-435-0535/fax 301-480-2858
E-mail schuckeb@gwgate.nhlbi.nih.gov

Thomas Blaszkowski, Ph.D.
Division of Epidemiology and Clinical Applications
National Heart, Lung, and Blood Institute
Two Rockledge Center, Room 8106
Bethesda, MD 20892
301-435-0417/fax 301-480-1864
E-mail blaszkot@gwgate.nhlbi.nih.gov

Mary Reilly, M.S.
Division of Lung Diseases
National Heart, Lung, and Blood Institute
Two Rockledge Center, Room 10112
Bethesda, MD 20892
301-435-0222/fax 301-480-3557
E-mail reillym@gwgate.nhlbi.nih.gov

Joyce Creamer, M.S.
Division of Blood Diseases and Resources
National Heart, Lung, and Blood Institute
Two Rockledge Center, Room 10170
6701 Rockledge Drive, MSC 7950
Bethesda, MD 20892-7950
301-435-0061/fax 301-480-1046
E-mail creamerj@gwgate.nhlbi.nih.gov

Bette Houston
Division of Blood Diseases and Resources
National Heart, Lung, and Blood Institute
Two Rockledge Center, Room 10159
6701 Rockledge Drive, MSC 7950
Bethesda, MD 20892-7950
301-435-0063/fax 301-480-1046
E-mail houstonb@gwgate.nhlbi.nih.gov

APPENDIX F

Workshop Planning Committee and Partnership Guide Reviewers

PLANNING COMMITTEE

Thomas Blaszkowski, Ph.D.
Health Scientist Administrator
Division of Epidemiology and Clinical Applications
National Heart, Lung, and Blood Institute

Janita Chicquelo-Coen
Program Analyst
Office of Science and Technology
National Heart, Lung, and Blood Institute

Michael Commarato, Ph.D.
Program Administrator
Division of Heart and Vascular Diseases
National Heart, Lung, and Blood Institute

Judy Corbett
Program Analyst
Office of Science and Technology
National Heart, Lung, and Blood Institute

Jacqueline Ellis
Program Specialist Trainee
Division of Lung Diseases
National Heart, Lung, and Blood Institute

John Fakunding, Ph.D.
Program Administrator
Division of Heart and Vascular Diseases
National Heart, Lung, and Blood Institute

Clifford Houston, Ph.D.
Associate Vice President for Multicultural Affairs
University of Texas Medical Branch at Galveston
Galveston, TX

Joyce Hunter, Ph.D.
Scientific Review Administrator
Division of Extramural Affairs
National Heart, Lung, and Blood Institute

Barbara James, M.P.H.
Minority Coordinator
Office of Science and Technology
National Heart, Lung, and Blood Institute

LeeAnn Jensen, Ph.D.
Health Scientist Administrator
Division of Blood Diseases and Resources
National Heart, Lung, and Blood Institute

Helena Mishoe, Ph.D.
Health Scientist Administrator
Division of Blood Diseases and Resources
National Heart, Lung, and Blood Institute

Deborah Noble
Program Analyst
Office of Science and Technology
National Heart, Lung, and Blood Institute

Mary Reilly, M.S.
Health Program Specialist
Division of Lung Diseases
National Heart, Lung, and Blood Institute

Lina Turner
Program Analyst
Office of Science and Technology
National Heart, Lung, and Blood Institute

Marie Willett
Deputy Chief, Grants Operation Branch
Division of Extramural Affairs
National Heart, Lung, and Blood Institute

Geraldine Wolfle
Assistant to the Deputy Director
National Institute of Environmental Health Sciences
Research Triangle Park, NC

REVIEWERS

George E. Brown, Ph.D.
Chair, Department of Biology
Prairie View A&M University
Prairie View, TX

David Chiriboga, Ph.D.
Professor, Department of Health Promotion and Gerontology
University of Texas Medical Branch at Galveston
Galveston, TX

Susan Galloway, Ph.D.
Director of Academic Grants
St. Mary's University
San Antonio, TX

Yvonne H. Hogan, Ph.D.
Professor, Department of Biology
Texas Southern University
Houston, TX

Richard L. Hoover, Ph.D.
Professor, Department of Pathology
Vanderbilt University
Nashville, TN

O. Ray Kling, Ph.D.
Vice Provost for Academic Affairs and Dean of the Graduate College
University of Oklahoma Health Science Center
Oklahoma City, OK

Rahbar Maghsoudi, Ph.D.
Professor, Department of Engineering
St. Mary's University
San Antonio, TX

Bharati Mehrotra, Ph.D.
Professor and Chair, Department of Biology
Tougaloo College
Tougaloo, MS

Gary Ogden, Ph.D.
Associate Professor, Department of Biology
St. Mary's University
San Antonio, TX

Frank Rothman, Ph.D.
Provost Emeritus and Professor, Department of Biology
Brown University
Providence, RI

Shirley Russell, Ph.D.
Professor and Chair, Department of Microbiology
Meharry Medical College
Nashville, TN

Gayle Slaughter, Ph.D.
Director of Special Projects
Baylor College of Medicine
Houston, TX

Joy Warner
Placement Officer
Texas Southern University
Houston, TX