Looking Beyond the Borders:

A Project Director's Handbook of Best Practices for International Research Experiences for Undergraduates

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1. Background and Introduction to NSF Philosophy

We look to science, technology, and engineering to increase the nation's productivity and economic well-being, advance healthcare, improve the environment, help ensure national security, and help educate our youth. The increasing economic role of science, technology, and engineering has, in turn, increased demand for all types of scientific, technical and engineering (ST&E) workers, from technicians to Ph.D. research scientists and engineers.

ST&E workers are essential contributors to both the public and private sectors. In the private sector, they help propel the economy and provide valuable services, such as healthcare. In the public sector, ST&E workers support important federal missions, such as maintaining a strong U.S. science and engineering enterprise and advancing biomedical research, national defense, environmental protection, energy conversion efficiency, food supply safety, and space exploration. For all these reasons, it is prudent to examine, to the extent possible, what actions will ensure that the nation has an adequate ST&E workforce in the 21st century.

[From: *Ensuring a Strong U.S. Scientific, Technical, and Engineering Workforce in the 21st Century*, National Science and Technology Council Report, April 2000]

Scientific and technological research and education are increasingly global in nature, and other countries are increasing their investments in these areas (National Science Board, *Science and Engineering Indicators—2000*). It is critically important to the nation's science and technology (S&T) enterprise that U.S. scientists and engineers, at early stages in their careers, develop the international experience and capabilities to support and participate in these activities. This sentiment resonates, most recently, in an interim report from the National Science Board on the NSF role in international science and engineering, especially in broadening opportunities for students and young researchers (National Science Board, *Toward a More Effective NSF Role in International Science and Engineering*—Interim Report). Beyond the opportunities presented by new global communication technologies, efforts to engage future generations of U.S. scientists and engineers in gaining first-hand professional experience beyond this nation's borders are essential, and should continue. Addition of an international dimension to successful, established models for undergraduate science and engineering education could have an immediate and positive impact on educational quality in the global scientific context.

Currently, the NSF Office of International Science and Engineering (INT) sponsors several activities that accommodate the international study and training needs of U.S. graduate students in science and engineering on either an individual (dissertation enhancement awards) or group (summer institutes) basis. Similarly, international postdoctoral fellowships support specialized individual research activities at foreign sites. The implementation by the Foundation of international Research Experiences for Undergraduates (international REU) addresses the need for a globally-competent

workforce broadly by strengthening the S&T training of young scholar-scientist-engineers. Such international research opportunities provide direct exposure to the international scientific and engineering communities. Several successful models exist for domestic REU sites and international graduate student summer institutes. The experiences of successful (and, perhaps, unsuccessful) domestic REU sites and international graduate student institutes can offer important lessons for effective international REU site design and management. However, these models do not universally provide for many of the particular needs of undergraduates in a foreign setting.

Presently, REU site directors informally share their best practices and lessons learned with Foundation program officers who often act as agents of information exchange. The collective experiences of these earlier NSF-supported international REU site programs, suitably gathered together and organized, provide a wealth of useful information to researcher-educators for the planning, development and execution of new, educationally sound international site programs. Timing is right for distillation of lessons learned and formulation of a reference manual describing "Best Practices" for NSF international REU site programs.

International REU site programs can promote the development of a globally competent workforce, especially in those fields where the professional degree is the baccalaureate or masters degree. The junior and senior years are an optimal time for the immersion of undergraduate students in an intensive international research experience; their scholarly interests are likely still quite broad, and the experience may foster a decision to pursue careers in science and engineering. In contrast, graduate students who are fully engaged in research studies in their home laboratories often find it difficult to free themselves for the extended period of time that most programs require.

Access to practical, field-tested advice can help international REU site project directors avoid unnecessary pitfalls and improve the success rate of new projects. This handbook has been created to meet the need for a succinct reference that will be useful in the development of your new activity.

2. How to Get Started

The prospective program director with an idea for an international Research Experience for Undergraduates site program quickly confronts the question, "How do I begin?" Some essential first steps begin the successful transformation of the idea to reality. Devise a plan for developing the program and apply the expert advice of experienced international REU site directors contained in this manual to guide that evolution.

2.1 Develop an outline for the international REU activity

Begin the planning phase with a clear exposition of program objectives. Consider how the proposed activity will benefit the specific scientific discipline and how it will also benefit the scientific community more broadly.

Investigate other domestic and international REU site programs. Join an existing REU "community," if one exists, and make contact with other REU program directors for advice and information.

Prepare an outline of the basic framework for the student research-centered research program, including the basic timeframe (approximate dates and duration) of the international experience.

2.2 Explore and develop partnerships

A domestic institutional home and a willing international colleague with institutional backing are critical to realizing the program, but additional domestic and international partnerships with departments, centers and institutions are valuable assets in many ways. Identify potential partnerships and affiliations and develop these resources.

2.3 Understand the National Science Foundation REU program

During the early stages of program development, prospective international REU program directors should read carefully the NSF program announcement for REU site activities. In designing an international REU activity, it is essential that the proposed international site program offer the same level of scientific focus, research training for students, and education and human resource development as that expected from domestic REU site programs. The National Science Foundation's REU Program Web page is located on-line at:

http://www.nsf.gov/home/crssprgm/reu/

In internationalizing the objectives of an REU program, the prospective U.S. director builds upon a solid REU platform; the proposed activity additionally addresses the need

for a globally competent S&T workforce and takes maximum advantage of a unique or complementary foreign resource appropriate to the field of study. Because of the increased amount of time and resources required to realize an international REU program, consider whether the foreign site provides an experience unavailable in the United States.

Explore existing REU programs. The NSF Web site includes a catalog listing of REU programs at:

http://www.nsf.gov/home/crssprgm/reu/reulist.htm

On-line resources for existing international REU and REU-like programs are listed in Appendix 1.

2.4 Discuss the proposed program with NSF staff

Do this using the outline for the proposed activity. Early discussions with program officers about the "appropriateness" of the REU site program to the field and for potential Foundation support, and the scale of the proposed site activity will lay the groundwork for all future interactions. Make a point to engage program officers in both the disciplinary program and the Office of International Science and Engineering. Prepare for these conversations by becoming familiar with the NSF REU program. Using a timetable for implementation, determine the necessary lead-time for a funding request.

2.5 Prepare a funding request for a planning visit and/or developmental support

On the advice of NSF program staff, seek funds for planning and development. Do not neglect special initiative funding, if available from the home institution or elsewhere. Identify the critical foreign counterparts (individuals and institutions), and schedule a planning visit to discuss their participation. If the proposed activity represents an extension of a core grant, supplemental funding may be possible to cover some of these development expenses or even a test program.

2.6 Plan and execute the initial, or test, program

Use a pilot program, if possible, to "test" the proposed REU plan. This can be accomplished on a modest supplemental budget prior to a request for full funding. Use the opportunity to fine tune program logistics and to generate more informed estimates of anticipated expenses. Practically speaking, for a trial offering most program aspects (applicant recruitment and selection, host scholar matching, travel and housing) can be handled with a small commitment of staff time.

2.7 Grow the program

Following a successful test program, finalize a plan for program growth. Decide whether to gradually "ramp-up" (over 2-3 cycles) to some target level, or to abruptly "step up" to that level. Coordinate this decision with the foreign host-director, who must cultivate host scholar-mentors for the program and manage many on-site arrangements, and then build this growth plan into the budget request.

Allow for mid-course correction during program development and growth. Use regular program evaluation and review to isolate weak program elements, and promptly take corrective action. Stay in contact with program officers at the Foundation, and share the experience of your successes.

3. Program Development

3.1 Establish clear research and educational objectives for an international REU site program

3.1.1 Know the target student audience

Identify, define and target the student audience early in the planning phase. The junior and senior years are an optimal time for undergraduates to be involved in an intensive international research experience. Set initial bounds on the target audience according to the organizational nature of the REU program. For example, a smaller single-institution REU program (*i.e.*, one that takes its participants from a single university) in marine volcanology may realistically draw participants from a well-defined subset of departments at that school, whereas a larger REU program in a more broadly-defined field such as civil engineering will draw candidates from many different institutions and will recognize the need for different strategies in advertisement and recruiting. Important considerations in targeting the student audience include:

- ***expected academic background and previous research experience by program participants:*** Quick and effective start-up by participating students may depend on previous research experience. This previous experience comprises familiarity with essential equipment and techniques, successful completion of an independent scientific experiment, or a sound course background as preparation. The expectation of uniformity in previous academic program and the ability to evaluate reliably the academic records of student applicants are benefits for a single-institution program. Nevertheless, an open-recruitment REU program increases access to highly qualified applicants and promotes diversity within the applicant and participant populations. Even in the best case, a narrowly focused REU program with academically strong participants may still necessitate formal training by some of the students in particular areas (for example, statistics in a field ecology program or computer technology in an informatics program). Take this into account and, if required, build the necessary training into coursework or workshops as part of the program.
- ***scientific research expertise of foreign hosts and overall strength of the foreign host institution:*** A successful student research experience depends on a reasonably good balance between the degree of research focus and the breadth of scientific/engineering competence at the host site. Strike a balance between depth and breadth by selecting appropriate foreign host institutes and mentoring scholars, and then factor this into program targeting. This balance is particularly important for those students who may not have formulated precisely their personal scientific and professional career goals.

3.1.2 Set realistic scientific, educational and career-promoting objectives

Set realistic scientific, educational and career-promoting objectives to fit the nature and duration of the foreign experience. Scale individual student projects such that participants can achieve progress or results sufficient to permit analysis and reporting. These are important components of the research process. The opportunity for the student

to engage in these phases, and to be able to report on his/her project at a closing symposium, adds an important sense of accomplishment.

Where possible, inject the use of new and effective strategies for improving science, mathematics, engineering and technology education at the undergraduate level. For practical ideas, consult the following two reports from the National Research Council Committee on Undergraduate Science Education:

Committee on Undergraduate Science Education 1997. *Science Teaching Reconsidered: A Handbook*. National Academy Press, Washington, D.C. 88 pp. ISBN 0-309-05498-2 Available on-line at:

http://books.nap.edu/html/str/

Committee on Undergraduate Science Education 1999. *Transforming Undergraduate Education in Science, Mathematics, Engineering, and Technology*. National Academy Press, Washington, D.C. 113 pp. ISBN 0-309-06294-2 Available on-line at:

http://books.nap.edu/html/transund/

3.1.3 Focus the research component

The focus for the research component depends practically on the scientific research expertise of the project director and of the foreign hosts and the foreign host institute. Program focus will also reflect partnerships between the international REU program and domestic REU sites or research centers; complementarity and synergy are powerful influences on focus. A research focus that is well defined and circumscribed (but not overly narrow) also fosters a sense of community and identity for the student cohort.

The U.S. program organizers must possess sufficient competence within the defined area(s) to guide effectively research projects and host selection and matching. The orientation and training period before student departure to the foreign host institution is too short to include any additional academic training.

3.1.4 Strive for overall balance of international and domestic components

There are many advantages to the inclusion of domestic components in an international REU site program. For programs in which all participants represent a single home institution, use the domestic component to provide laboratory research in preparation for the foreign experience, foreign language lessons and cultural training, or other pre-trip activities. Familiarity among participants and a stronger sense of group identity result from carefully designed domestic components (even if these activities involve only American students within a bi-directional program; Section 3.1.5).

3.1.5 Seek reciprocity through bi-directional student movements

Add reciprocity to the program by receiving foreign undergraduate students. Reciprocity through bi-directional student movements in the international REU program

adds value in several ways. Prior interaction with foreign students in a domestic setting builds personal familiarity and cultural sensitivity, promotes a "fast start" for participants at the international host lab, and gives other students at the home site a taste of international collaboration. Reciprocity also helps to engage the interest, efforts and resources of international counterparts.

Reciprocity demands careful timing; this is, perhaps, more easily achieved when all U.S.-side participants attend the same domestic institution (the single-institution model mentioned earlier; Section 3.1.1). If academic calendars are different at the home and foreign universities, take advantage of this asynchrony by scheduling the foreign students' visit while the home institution is in session. Regardless, reciprocity is possible in any summer program at the expense of shortened time abroad; for example, the program might comprise 4-8 weeks at a U.S. site and 3-6 weeks at the international site. The ability to achieve this "split" (and the proportion of time spent at home and abroad) may be field specific. Mathematics or theoretical science projects, or other "transportable" projects that are not limited by access to major equipment and facilities, may be more amenable to reciprocal arrangements.

Reciprocal models for international REU site programs are more challenging to design, to implement and to manage. Reciprocal programs require more resources, commitment and management time than do unidirectional programs. Incorporate some level of incremental reciprocity through:

- receiving a smaller, but representative, group of foreign students at the domestic REU site (to build familiarity);
- promoting interactions between visiting foreign students and undergraduates generally at the domestic site;
- receiving the foreign REU site director or perhaps some foreign faculty mentors at the domestic site (to build familiarity and to discuss foreign site projects); and
- incorporating joint research training programs for both U.S. and international participants prior to the start of individual research projects.

3.1.6 Link with foreign host scholars and international host institutions of quality

Since the scientific experience is central to the international REU site program, the professional expertise of foreign host scientists is critical to the achievement of program goals. Project directors can develop rosters of potential host scholars in several ways. Since self-nomination may generate a sizeable list of willing mentors, employ screening to assure that those selected to serve as mentors can provide the necessary support to visiting students. Consider these examples of screening and selection criteria: prior experience and success with student project supervision, time and accessibility for mentoring and guidance to the student, funded research program capable of supporting laboratory expenses of the student, and lecture and laboratory space to accommodate the student projects. Once a list of potential research advisors is established, impose additional criteria for matching students to hosts. Foreign research advisors with some (perhaps direct?) understanding of the U.S. educational system can be very effective in

the mentoring role. Have an informed, and trusted, foreign-side program director or coordinator help evaluate host suitability during the selection and matching processes. In the end, give preference to those host scientists most capable of contributing to the intellectual development of the student and of facilitating a successful research activity. (See Sections 5.2.2 and 5.2.3 below.)

Selection of the proposed host institution often reflects the current international collaborative research ties of the U.S. project director, but the selected institution must nevertheless meet the program's needs. It must be of adequate size and possess sufficient facilities to support the proposed number of participants. If the program will be conducted at a single site, there must be a suitable number of host scientists available without compromising the quality of student-host matches. Some centers of excellence truly represent "international crossroads" (CERN, the European Laboratory for Particle Physics, is an example). In addition to their central research activities, these rare sites are rich in their offerings of conferences, workshops and classes. Ultimately, the international host site must be of sufficiently high quality, reputation or, for field studies, of intrinsic scientific interest to add value beyond that available at domestic hosting sites.

3.2 Build a sustainable program

3.2.1 Determine "critical mass" and optimize program size

The number and quality of potential student participants in the target audience and the number of qualified and available host scientists are powerful determinants of program size. For programs in very narrow, specialized fields it is difficult to attract more than a few (perhaps 4-6) qualified students unless eligibility is extended to students outside the domestic sponsoring institution. Similarly, it is unlikely in narrow research fields that more than a few appropriate host scientist-engineers will be located within any single foreign university. Dispersal of students to distributed foreign sites provides access to a greater number of scientific hosts, but it may then be difficult to build a sense of community among the participants, and the individual students may also feel isolated. Address these challenges by organizing all-inclusive group activities that will bring participants together; seminar meetings and site visits to special scientific facilities or natural history field sites can meet the desired objective (Section 6.6). In the case of geographically distributed host sites, consider assigning students as no less than pairs to any site. Alternatively, consider hosting the international REU program at a major research center or organization that can meet the demands of a large student program at a single site. Give careful thought to the notion of "critical mass" in development of the desired group dynamic, and do not neglect scaling effects on cost effectiveness, and on time and resources (Section 4.1.4).

3.2.2 Establish institutional commitment of participating universities, U.S. and international

Both large and small international REU site programs benefit from solid institutional commitments. At the domestic home institution, this commitment takes many forms, such as re-tasking existing secretarial or administrative support, partial

release from classroom teaching responsibilities for the project director and co-director as compensation for the additional burden on personal time and resources, or financial backing to underwrite some program expenses (for example, participant allowances, pre-trip orientation expenses, and administrative support). The campus' international studies office may assist with the provision of student travel insurance, risk assessment, and contributions to a pre-trip orientation. From the perspective of the program's home institution, benefits accrue in the form of positive national and international exposure through name association with a quality undergraduate research program. Actively engage the home institution when planning international REU programs, especially if student participants will be recruited nationally and the program will include only a small number of students from the program's institutional home. Program director(s) should highlight the institutional benefits of association in order to obtain the desired level of commitment. Emphasize to the university that through "program hosting" such as this, it gains access to strong, highly qualified potential graduate students.

Foreign institutions can show their commitment to the program by facilitating important logistical arrangements, such as the provision of convenient and clean housing, meals and local transportation, facilities support for program activities (opening and closing activities), assistance in requesting visas and local permits, *etc*.

Formal recognition by the home and host institutions and other involved agencies is an important component in safety and security for program participants (Section 4.5.2).

3.2.3 Consider the frequency of program offering

The frequency of program offering depends strongly on the ability to fill the class (or to reach "critical mass") at regular intervals (annually or biannually, for example). Continuity is critical for becoming recognized as an outstanding international REU program and, in this regard, annual offerings are preferred in some contexts. Applicant pool size will be affected as eligibility requirements are broadened (for example, junior- or senior-level science *or* engineering majors) or narrowed (for example, biochemistry majors with laboratory research experience). As a result, alternate-year offerings may sometimes be the only realistic result. Faculty members need to consider the administrative burden relative to staff size, as well as their other academic and professional obligations, when determining the frequency of program offering. A faculty member may simply be too busy to devote the necessary time for preparation and execution of an annual program. Co-directorships or increased institutional commitment and support can alleviate the administrative burden placed on a single program director.

If biannual offerings are a necessity, consider reunion meetings or a domestic program in the "off" years to build and to continue a sense of "community" among alumni.

Regardless of the frequency of offering, develop a "rhythm" for the program. Prospective applicants, alumni and faculty mentors can anticipate the program cycle and prepare or advise confidently. Program staff will regularize their seasonal workload planning.

3.2.4 Set a realistic expectation for longevity

Long-term funding from a sponsoring agency cannot be assured, even under the best of circumstances. Strive for diversity in funding support to assure an enduring program. International projects are frequently eligible for funding from international foundations if foreign students are involved. In addition to reducing reliance on a single agency, multiple sponsorships provide flexibility through a robust program budget and add independence from fiscal year considerations under single-agency funding (*viz*., conflict between the program's spending cycle and end-of-cycle spend out for the funding award, or delays in renewal funding). Should the institutional benefits be great enough, universities may be inclined to underwrite an international REU site program at a higher level to assure its continuation. Additionally, private funds from companies in relevant fields are an available option to strengthen the funding base. In this regard, evaluation and reporting (Section 7.2) and publicity and promotion (Section 5.1.1) become critically important.

4. Program Planning

4.1 Develop a management plan

An essential component to any program's success is a thoughtful, comprehensive and effective management plan. Develop one. Assemble this early in the program planning stage, since it provides a clear framework for the preparation of the administrative budget. A project management timeline is a useful first step (Section 4.6). Include a chronology of major program deadlines and the necessary needs of administrative support and human resources, as well as the timing of fiscal expenditures. Codify and distribute the management plan to all concerned parties, including the host institution and partners. A well-informed staff that recognizes their roles will effectively handle routine matters and most problems without undue burden to the director.

4.1.1 Identify a management team

Programs involving more than a few students from a single institution increase the administrative burden and, in many cases, cannot be effectively managed through the efforts of a single individual. Whereas a single director can provide overall leadership to the program, an administrative assistant (full- or part-time according to program size) will be critically important in managing the day-to-day activities, especially during the advertising and application periods when significant time will be spent in responding to applicant requests for material, and in receiving and screening submitted applications. Consider co-directors as an option, especially if access to support staff is limited.

Carefully anticipate the number of mentors (both domestic and international) according to the nature and needs of the program, and implement a scheme for recruitment and selection. Seek continuity commitments from the best mentors so subsequent students benefit from their mentoring skills.

Whereas the major focus on management team development is on administrators [director and co-director(s)], mentors and support personnel, give special attention also to student assistants, who can be essential in the success of an international REU program. Graduate student assistants on the domestic side can help specifically in the screening and the selection of student participants, in communicating with the participants before they arrive, in greeting them on arrival, in running "getting to know you" social programs, and generally in helping out with the "chemistry" of the whole event. One or more of the student assistants can be sent along to the foreign site to act as both a chaperone and as a leader and liaison between U.S. students and the foreign site director and staff. Advanced undergraduates (perhaps program alumni) can play these roles in programs with no access to graduate students. Of course, faculty members can assume these roles, too. In reciprocal programs (Section 3.1.5), a graduate student chaperone/leader may accompany foreign participants to the domestic program and play similar roles in reverse, while also helping to orient U.S. students before their foreign travel.

Prepare job descriptions for the management team, especially if program staff are shared with other projects or offices. In the case of student assistants, or others whose associations with the program may be temporary or rotating, the key components and responsibilities must be clearly identified. For the student assistants mentioned above, note the importance or necessity of foreign language skills, availability as first point of contact, and the importance of this position during the early stages of the program at the foreign site.

Identification of a single purchasing agent or administrative/accounting/travel officer on campus facilitates the preparation of program-related paperwork; make every effort to inform this person of the nature of the program and of the anticipated timetable of expenditures, and of administrative and financial reports. A travel coordinator, as part of the management team, handles this aspect of the program for the director, and acts efficiently as a liaison between the program and travel service offices inside and outside the university.

4.1.2 Know the real management burden

The management burden of an international REU program can quickly become overwhelming, especially for a single project director. No-cost solutions are available in part through relief from, or rescheduling of, other university obligations. Cooperation from the home institution administration is valuable; make every effort to "sell" the project, especially before it is launched (Section 3.2.2).

4.1.3 Establish and monitor program costs

In order to avoid budgetary shortfalls and other problems, pay careful attention to anticipated program costs during preparation of the initial budget and to actual expenditures once underway. Sort costs into administrative and program categories that may be fixed to some extent, and into participant costs that may scale more directly with the number of student participants. Some examples of these costs are:

Administrative Costs	Program Costs	Participant Costs
• Administrative assistant salary	• Advertising	• Travel expenses (international and local, on-site)
• Summer salary for director	• Pre-departure orientation	• Housing
• Postage, photocopy, telephone	• Language training	• Allowance/stipend
• Office equipment/supplies	• Web site, newsletter	• Laboratory fees or supply budget for foreign host
• Fees to travel agent or other service contractors	• Travel Expenses of Director	• Insurance
	• Opening/closing activities	• Passport/visa fees
	• Group activities (foreign site visit travel and expenses)	
	• Evaluation/assessment	

4.1.4 Seek cost effectiveness, efficiency, and scaling effects related to program size

Since some program costs are fixed (or have incremental thresholds according to participant number), there are clear savings through efficiency if participant number is optimized. For example, if language class size is optimized at 10 students, it might make sense to set the number of program participants at a multiple of ten (other factors being equal). Similarly, subtle differences in the composition of the participant pool can have larger effects; for example, even numbers of male and female participants can most effectively fill double-occupancy housing that is paid by the room rather than by simply the number of participants. Some group costs can be contained when students are centralized at a single facility.

4.1.5 Bear in mind the realistic costs for the project director

Project director costs include not only the time committed to the project, but also the loss of other opportunities. The personal and professional cost of running an international REU site program will be large. Institutional commitment and formal recognition of the director's efforts can help to offset the potential negative consequences of time spent on activities that do not garner the sorts of recognition that accrue through traditional research activities, scholarly publication, and university and professional service.

Find effective and creative solutions to the competing demands on the project director. Incorporate research publication and productivity building into the project director's participation (for example, through careful selection and tuning of research

focus). Adopt a model of co-directorship when designing the management plan, and include funds for administrative support in the budget request to NSF.

4.1.6 Anticipate staff time commitments

Carefully assemble projections of future program expenditures as part of a project timeline. Do not minimize or underestimate the commitment of staff time (and its cost), especially in the first year of a program. The time and effort needed to answer questions, handle applications, reserve housing, line up mentors, *etc.*, are substantial.

4.2 Promote interactions with existing domestic REU sites or research centers

Interactions with existing domestic REU sites or research centers have strong positive effects. Linkage with a successful domestic REU program or with a research center provides access to experienced, research field-specific domestic faculty mentors. If the center has international ties with one or more foreign universities, centers or research institutes, a framework may already exist for cooperation in developing and operating an international REU program. Ideally, such a framework facilitates bi-directional student movements in the international REU program (Sections 3.1.5 and 3.1.6). If an existing domestic REU program or research center has a strong reputation, a new international REU program will gain immediate credibility by association (Section 4.2.2).

4.2.1 Foster strong institutional grounding on domestic and international sides

Interaction with an existing domestic REU site provides an immediate strong institutional grounding for the international program. It is likely that the domestic program already has a supporting infrastructure that can be expanded to include a new international component. This permits greater efficiency of scaling compared with a standalone international REU program, especially during pilot phase operation. Additionally, an established domestic program will have a solid scientific focus and core "culture" that enriches the international program.

4.2.2 Cultivate appropriate degree of (in)dependence for international REU program

Importantly, the international REU program must develop an appropriate degree of independence and identity. It cannot be simply an international extension of the domestic program, even though the international experience may be quite valuable for the student participant in its own right. Rather, there should be real added scientific value in the international component. More than just adding an international component with its effect on cultural broadening, the international REU program will exploit some unique or special resource (intellectual or natural resource, or research facilities) through international collaboration. Certainly, there is great strength abroad in some fields.

4.2.3 Build alliances

Build alliances regionally or nationally with REU programs in similar fields of science and engineering, and with other international REU programs. Benefit by sharing

information and ideas with this network, or "community," of REU programs and administrators. Engage a leadership group to develop a Web site or listserv. Provide contact information for program directors and shared access to program resources such as calendars of events, database of speakers, and evaluation questionnaire templates and other forms.

4.2.4 Use affiliations and partnerships to recruit "research experienced" participants

If student participation in a previous research project is preferred for international REU program applicants, domestic REU and other research programs offer convenient recruiting access to qualified students in appropriate fields. Establish personal contacts with administrators of these programs.

4.2.5 Include an element of vertical integration, and "bundling"

Involvement of faculty, postdoctoral scholars and graduate students with the REU program adds vertical integration to the program. Importantly, access to scientists and engineers at various stages of their careers can assist junior scholars in discovering the field and in charting their future career courses. Consider bundling programs (or, at least some of their activities) with the international REU program. For example, explore linkage with an NSF Integrative Graduate Education and Research Traineeship (IGERT) program or with an NSF Research Experience for Teachers (RET) program. Bundling with an RET program might be manifested as REU-RET participant pairing in an international context. Partnerships with RET represent a long-term investment since the teacher-participants ideally will share their international experiences with future undergraduates in their high schools. On-line resources are available at:

NSF Integrative Graduate Education and Research Traineeship Program (IGERT)

http://www.nsf.gov/home/crssprgm/igert/

NSF Research Experience for Teachers (RET)

http://www.nsf.gov/pubs/2001/nsf0118/nsf0118.htm

4.3 Note calendar issues

The design of a program calendar quickly becomes a complex matter especially if participation includes students from more than a single domestic institution. Due to differences in academic calendars at U.S institutions and foreign institutions, student participants may complete their scholastic obligations any time in the month of May (for schools following a semester system), or even as late as mid-June (for schools on the quarter or trimester systems). Similarly, starting times for schools occur from mid-August through early September. Combining these elements over which the project director has little personal control, the calendar window for summer international REU activities narrows to a period between mid-June and late-August. Although one innovative solution may be the incorporation of flexible components for students, as is

the case for internships in industry, this must be balanced with the need for full attendance during some program components (*e.g.*, coursework and training workshops, and student symposia).

4.3.1 Establish duration of foreign site program

The maximum practical duration of the foreign site program is probably 8-to-10 weeks. Efforts to extend that duration can compromise the desirable group-centered opening and closing activities as home institution calendar considerations impinge on the schedule, and as participants' academic obligations draw them away. For an international REU program under the single-institution model, consider scheduling the closing activities and/or the student reporting session at the home campus in September (Section 6.7).

4.3.2 Weigh compatibility with host institution calendar

The academic calendar of the foreign host institution also constrains program timing, especially if multiple foreign institutions are involved. If the international REU program is large and there is an intention to use host institutional housing, carefully coordinate accommodations for student participants in dormitory facilities well in advance to avoid conflicts. For smaller groups this is less of a concern.

4.4 Heed funding considerations

4.4.1 Time funding application relative to program dates

Significant lead-time is necessary to assure that funds are in hand when program-related expenditures actually begin. Agency decisions on funding typically require 6 months, and sometimes longer. If expenditures for a summer international REU program begin in the preceding fall (advertising costs, for example; see timeline, Section 4.6 and Appendix 2), then a realistic deadline for application submission is at the start of that calendar year, a date almost one-and-one-half years in advance of the anticipated program start date. Of course, this degree of advance planning will affect only the first program offering under a multi-year award. If institutional funds can cover the early advertising costs, then a delay in the actual delivery of funds may be acceptable since the next substantial expenditures will occur in the spring when travel arrangements will be made. If a planning grant was used to develop the international REU site program, some promotional activities may be possible under the terms of that award given sufficient funds. In the end, however, plan early to avoid mismatches with established agency funding cycles.

4.4.2 Inquire about longer-term funding

The additional lead-time required for operating an international REU site program (compared with a domestic program), coupled with the need for timely funding to cover early program needs, can be addressed practically through longer-term awards that increase the interval between the preparation of renewal proposals. The continuity assured through longer-term funding is beneficial, too, since international research labs

need to be cultivated as hosting sites. Five-year awards (rather than the more typical three-year duration) make sense for international REU programs, and especially those that may operate on an every-other-year basis. Engage program officers in discussions of timetables for planning and execution, and explore alternative funding schemes that realistically address project needs for additional time in program planning and recruitment; for example, explore the possibility of three years of funds with an award duration of four years. Otherwise, good student participants may be lost to competing research opportunities if acceptance to the international REU program is made "subject to funding."

4.5 Do a risk assessment: safety and security

Arrange a meeting between the project director and the REU program administrative team with officers at the sponsoring home institution to assess program risk. Include appropriate university officers in this important discussion; at a minimum, invite the general counsel for the institution and other officers according to program needs. For example, directors of REU site projects in the field of chemistry might choose to consult with an office of environmental health and safety, whereas directors of projects in marine science might consult with a campus diving and/or medical officer. Since the sponsoring university may have significant liability exposure based on the nature of the research work and on the age of the participants, a risk assessment exercise and safety plan protects the interests of all. For field projects, especially, build risk mitigation costs into the budget.

4.5.1 Collect the necessary permissions and clearances

From the risk assessment exercise, derive suggestions for the program application form and other paperwork needed to address both general and specific liability issues. These documents include, variably: (1) waiver of liability form, (2) parental permission and travel release form, (3) health insurance information and consent-to-treat form, and (4) medical clearance form that requires the certification of a physician that the applicant is fit to participate in the program (Appendix 3). Use these documents to disclose accurately and specifically the risks or challenges imposed by program participation (for example, risks of international travel generally, geographical isolation of the group, stressful working conditions, endemic diseases, potential chemical exposures or other health concerns at the foreign site, *etc*.).

Engage the appropriate officers at the international host institute to ascertain if there are additional requirements for permissions and liability waiver forms at the host site, or if there are requirements for special insurance (*e.g.*, chemical lab safety insurance); determine these. For field projects, research permits or residency permits for researchers may be required. Early discussion with the foreign host institute resolves these issues, and the necessary paperwork can be sent with the other home-side forms to participants, and be received by the program office in timely fashion. With the assistance of the appropriate "country desk" at the State Department, or the appropriate foreign offices, look into the need for special permits or clearances to operate at the foreign site

and into issues of citizenship immunity. Avoid "short cuts;" cover all official bases and always "do the right thing."

For programs with reciprocal elements, coordinate foreign student visits with the appropriate international affairs office on campus. Determine the visa requirements for student visitors under the program, the necessity of supporting documentation and forms (for example, letters of guarantee and Form IAP-66), and the timetable for requesting the necessary visas and forms.

4.5.2 Assure Safety and Security

International travel carries with it inherent risks, since both participants and staff will be outside the protective borders of the United States. Abrupt changes in political stability and surprise terrorist actions in the air or on the ground are not impossible events in today's world. International REU program directors are alert to this potential for personal harm, even if it is slight. Protect the interests of participants, staff, home and host institutions, and sponsoring agencies by evaluating these risks and completing these proactive precautionary steps:

- seek formal program recognition from the home and host institutions (Sections 3.2.2 and 5.2.1);
- coordinate foreign visits with U.S. Embassy, and provide a roster of participants (Section 5.1.11);
- assess travel safety to and at the foreign site (use consular fact sheets or contact the appropriate U.S. State Department country desk; Section 5.1.1);
- include safety and security concerns in the overall risk analysis exercise, and seek expert advice as appropriate;
- know the location of the nearest medical facilities; and
- maintain close, regular contact with local reliable adults in the area where students will be residing.

If concerns regarding safety and security do arise, do not proceed with the international site program until a risk analysis has been repeated; if the program is underway, call the participants and staff home if warranted. Consider devising a "backup" domestic program, although this may be a luxury reserved for center-based REU programs capable of securing an adequate number of qualified mentors on short notice.

4.5.3 Conceive and implement an emergency management plan

Develop contingency plans for some emergency situations and be ready to set the appropriate precautionary or reactionary measures in place. For example, in the case of a field study at a remote locale, have plans for emergency communication and for medical evacuation. Following on the example of a field expedition, risk assessment studies may also reveal the need for additional material and training support (medical supplies and training, CPR training requirement for all participants, satellite telephone for emergency communication, *etc*.). Involve students in this responsibility. Similarly, establish a

prescribed chain of command in the event of injury or incapacitation of the group's leader, and brief all participants on this in advance. In some situations, by necessity, the chain of command includes one or more student participants who may be called upon in various means for support or leadership.

Conceive an evacuation plan for individuals and for the entire program group, in the event it is needed. Coordination with the U.S. Embassy is essential in an emergency situation, when instructions may be issued to all American visitors (Section 4.5.2).

Include in the emergency management plan clear instructions for contacting the American Embassy at the foreign site, and for communicating a roster of participants. Maintain a list of emergency contacts and procedures in a centralized office accessible to all participants.

4.5.4 Have family contact information in case of emergency

Be certain that the on-site supervisor (American REU director or international host administrator) has emergency contact information and signed consent-to-treat forms for each student participant. Collect this information as part of the pre-trip paperwork from accepted applicants and make several photocopies for distribution to on-site program staff. Respect the privacy of this information (Section 5.1.4).

4.6 Develop an individualized international REU program timeline

According to its nature and size, each international REU site program develops a somewhat unique calendar. A sample timeline for a representative summer program's annual cycle is presented in Appendix 2. It organizes the major events from the perspectives of the home-side program office, the international counterpart and student-participant perspective. Smaller REU site programs with student participants from a single institution will adopt simpler, compressed timelines. Note that the time span of activities for a single program cycle (including advertising and follow-up surveys) can easily exceed one year in duration and, as a consequence, calendars for consecutive annual programs will overlap.

5. Pre-Program Activities

5.1 Home-side activities

5.1.1 Develop an advertising and recruitment strategy

Develop a recruitment strategy that will attract qualified applicants from the target audience, including members of underrepresented groups (women, minorities, and persons with disabilities). Provide equal access for students at institutions where opportunities for research are limited. The overall quality of advertising, of the student recruitment mechanism, and of the selection processes and criteria are important elements since these will be scrutinized in agency evaluation of the international REU site program proposal for funding.

Web resources provide ready assistance in developing outreach to underrepresented groups. Some useful sites are:

American Indian Science & Engineering Society (AISES)
http://aises.org/

Association for Women in Science (AWIS)
http://www.awis.org/

Historically Black Colleges and Universities (HBCU)
http://eric-web.tc.columbia.edu/hbcu/index.html

Minority On-Line Information Service (MOLIS)
http://www.sciencewise.com/molis/

National Society of Black Engineers
http://www.nsbe.org/

Society for Advancement of Chicanos and Native Americans in Science (SACNAS)
http://www.sacnas.org/

Society of Women Engineers (SWE)
http://www.swe.org/

[Each of these sites offers many useful links to additional societal and institutional resources.]

Active partnerships with minority-serving institutions can increase the numbers from underrepresented groups in the applicant pool.

The NSF Louis Stokes Alliances for Minority Participation (LSAMP) Program supports partnerships among academic institutions, government agencies and laboratories, industry and professional organizations for the purpose of increasing the

number of minority students successfully completing baccalaureate and advanced graduate degrees in science, mathematics, engineering and technology. Active LSAMP programs have established networks of contacts that can be utilized for dissemination of program announcements. The LSAMP Program Web site includes a list of program awardees; the URL is:

http://www.ehr.nsf.gov/ehr/hrd/amp.asp

Real and/or perceived cultural barriers may deter some students from pursuing the application process. Clarity in advertising can highlight the accessibility of programs to all qualified undergraduates, and encourage their application. For some students, there may be a lack of understanding by the family of the value of the additional research experience (beyond the normal academic year program) and the necessity of leaving home to do this. There may be too few role models for leadership in the particular field of study, or they may not be fully accessible to the targeted student audiences. The professional societies listed above provide important networks to address these issues. Some students and their families may rely on summer employment for financial survival; for these students, the value of the summer allowance can be a critical factor in their decision to participate.

Primarily undergraduate institutions (PUIs) offer another academic "tier" for targeted recruitment. The Council on Undergraduate Research promotes undergraduate research-based education in PUI settings. The Council maintains a directory of institutional members and a registry of undergraduate researchers at its comprehensive Web site:

http://www.cur.org

Establish effective recruiting linkages with PUIs, especially if they are minority serving. Partnership with local PUIs is an effective first step in opening up single-institution REU programs while simultaneously adding an additional dimension of diversity. Strive for diversity in partner institutions as well as applicants. If possible, formalize (or "franchise") these institutional partnerships and build them into the proposal for funding.

Utilize electronic communication, the most efficient and least expensive advertising mechanism. Effective use of electronic dissemination requires time investment in "targeting," however. Whereas "broadcast" e-mails can potentially reach large audiences, application returns from selected addressee audiences generate higher quality, more appropriate applicants. Develop program-specific distribution lists along the following lines:

- chairs of academic/departmental programs in specific fields of science and engineering*;
- membership lists of professional societies*;
- professional society newsletters (especially student newsletters);
- student participants in other REU site programs (this is useful if previous research experience is desirable);

- other agency-sponsored undergraduate research programs (*e.g.*, NIH Minority Access to Research Careers); and
- research centers and field stations.

[* Target especially individuals at institutions with strong evidence of research and academic activity in the target disciplines, and institutions with more than two faculty members in the field.]

Send each target audience a "personalized" letter with the program information that is most relevant to the reader, and request that the announcement and the Web address (URL) be shared with students and mentors.

5.1.2 Maintain a content-rich Web site

An informative resource site is essential, especially for larger programs looking to tap a national applicant pool. A content-rich Web site with clearly visible contact information provides interested viewers with an exciting overview, and a means for communicating with program staff. Prospective students learn about the program through Web-based features highlighting program activities, laboratory projects and foreign host sites, alumni reports (Section 7.1), *etc*. Clearly state eligibility requirements (for example, that only U.S. citizens and permanent residents are eligible under program funding from NSF), and post application materials as downloadable documents. Word processor documents and interactive PDF files are ideal for this purpose.

If possible research topics were solicited from host scholars (Section 5.2.2), make these topics available on the program Web site before applications are due, so students can rank order their preferred projects. Or, give applicants this choice after applying or even after acceptance.

Additional Web links for logistical-related information are useful at later stages when accepted students are preparing for their travel:

- U.S. Passport Service (http://travel.state.gov/passport_services.html)
- U.S. Department of State (http://www.state.gov) for links to a catalog listing of services and information for U.S. citizens abroad, and to travel warnings and consular information sheets
- Traveler's Health Information from the United States Centers for Disease Control & Prevention (http://www.cdc.gov/travel/)
- NSF Overseas Offices in Tokyo (http://www.nsftokyo.org/) or Paris (http://www.nsf.gov/home/int/europe/index.htm), if these are appropriate to program destinations in East Asia or Europe, respectively
- Web address (URL) of foreign host institution
- insurance requirements and links to providers (Section 5.1.13)
- foreign tourist bureaus

- map of foreign arrival airport
- counterpart government agency (if appropriate)
- foreign consulate in U.S. (for visa application)
- foreign weather*
- currency conversion*
- foreign time (http://www.worldtimeserver.com/)
- international telephone dialing instructions including comprehensive listing of country and city codes (http://www.att.com/global/english/consumer_information/dialinginstructions.html)

[*Links to Web-based weather services and currency converters appear on the weather and financial pages, respectively, of on-line editions of major newspapers.]

5.1.3 Launch an effective participant selection scheme

Each international REU site program will develop a selection scheme that is best suited to the nature of its program. Effective design of application forms provides the director or screening committee with the most useful information possible for participant selection. Application forms serve the program staff in other ways. They provide important information for host matching, for follow up communications and program evaluation and reporting to the sponsoring agency, and even emergency contact information (this is required information in the case of successful applicants). Request the following information on the application:

Personal Information:

- Name
- Home Address/Phone/E-mail
- Institutional Address/Phone/Fax/E-mail
- Citizenship (U.S. Citizen/U.S. Permanent Resident/Other; if permanent resident, request citizenship to confirm visa eligibility and requirements)
- Passport Number (So as not to deter application by those student presently lacking a passport, simply alert applicants that a passport will be needed for program participation.)

Academic Information:

- Year in School (Freshman/Sophomore/Junior/Senior)
- Department/Major/Program
- Coursework Summary
- Name/Address/Phone/E-mail of Department Chair/Advisor

Emergency Contact Information (this can be collected from accepted applicants):

- Parent/Guardian Name/Address/Phone
- Parental Permission
- Insurance Information and Consent to Treat
- Physician's Medical Certification

Ask students, "How did you learn about the program?" Their responses contribute to more effective advertising and promotion.

Academic credentials are useful for evaluation and selection of participants. According to the scientific objectives of the program, the following components are suggested:

- Statement of Career/Research Interests and Objectives
- Summary of Previous Independent Research
- Undergraduate University Grade Transcript
- Letters of Reference from those familiar with the applicant (the reference form should include space for writer's contact information, should follow-up communication be necessary)
- Language Training (Foreign Language and Years of Study) and International Experience

Address the readiness of the applicant to pursue an overseas research project in the application package through either self-assessment or through directed queries to the reference writers. In the context of an application for an international study and research experience, reference letters from writers outside the applicant's home department may be more revealing (and valuable) in terms of assessing the applicant's interpersonal skills and his/her ability to function in novel and/or stressful situations. Use targeted questions to elicit from recommenders the information that you desire, *viz.*, indications regarding the likelihood of student success in a specific overseas program, especially where cultural or field condition concerns exist. It may be useful to request at least one letter from someone who has seen the student in a variety of situations (or, at least, in situations outside of the classroom) and who can speak to those observations. Bluntly stated, a faculty member who sees the applicant for less than three hours per week in many cases will know that person in only limited ways, and may not be able to comment on the student's ability to travel and study abroad. Similarly, letters from the department chair will be of little practical use unless the chair also has been an instructor of the student. Explore personal readiness (maturity, independence, *etc*.) and interest level with the applicant through directed questions on the application, or through in-person or telephone interviews. Consider results of these assessments in the context of the specific host site, and the availability on-site of support and personal interactions.

A sample application and related program forms appear as Appendix 3.

Consider application mechanisms that permit (or even encourage) e-mail or electronic submission. Similarly, devise a document management scheme that provides convenient access to those who will review the applications. A Web-based application system efficiently addresses both goals.

The selection process yields a pool of applicants to whom acceptance packages will be sent. Draft a congratulatory acceptance letter, but also include a clear statement (and calendar) of obligations including: timely acceptance of the participation offer, completion of the parental consent form, participation contract, and associated health and personal information documents, *etc*. Obviously, some time is required to complete these formalities. Nevertheless, an earlier deadline for their completion and submission is preferable to a later deadline. Students not intending to participate might delay their withdrawal notification in the face of relaxed deadlines, and make it unnecessarily difficult to fill the vacated space on short notice. Ask the accepted applicants to execute their formal acceptance through a signed letter of intent, or perhaps through a contract-like document that includes parental consent, acknowledgment of participant responsibilities, a participant's code of conduct, waiver of liability, *etc*.

There is substantial competition among REU programs for the best student applicants. Timely acceptance actions by the screening committee, competitive allowances, and the overall attractiveness of a program contribute to successful recruiting. Increase the acceptance rate of first-round offers by establishing personal contact with accepted applicants. Call each student on the telephone to deliver a congratulatory message, and encourage him or her to stay in contact by e-mail or telephone, as necessary.

Consider selecting several candidates as program alternates to fill participant slots should they become available as a result of participant withdrawal. Selection of alternates depends on the study interests of participants and the negotiated student-host pairings; appropriately identified, program alternates with compatible interests can be seamlessly placed into host labs. As with accepted students, establish personal contact with those on the "alternate list" to retain their interest. This may also encourage reapplication in the following year of students near the top of the alternate list. In any event, preparation will allow quick action, if needed, to replace participants who withdraw. (See Section 5.1.14 below on withdrawal procedures.)

At some point during the application review process, ask the foreign host or potential foreign mentors to review the credentials of those student applicants slated for acceptance (Section 5.2.3). For reciprocal programs, a parallel review of foreign student applications will be underway by domestic program mentors. Following approval by the host scholar, send accepted students a letter of invitation to the program that includes the name of the assigned host and suggested scientific topic(s) for research. Ask the students to respond formally and in a timely manner to the invitation. Although it sounds overly complicated, this carefully choreographed notification and acceptance by host and

student offers both the chance to withdraw from a possible mismatch. This deliberate exchange leads quite naturally to the virtual introduction of host and student, and to the initiation of communication regarding the student's research work (Section 5.2.3).

5.1.4 Protect program information

The program office gathers and maintains personal and potentially sensitive information during the application and screening processes. As with other university records, the use and distribution of these materials is regulated. Specifically, the Family Educational Rights and Privacy Act (FERPA; 34 C.F.R. Part 99) is a Federal law designed to protect the privacy of education records. Under FERPA, postsecondary students also have certain rights with regard to viewing their educational records, including reference letters. Program staff should be trained in appropriate document management procedures; the home institution likely has established guidelines in place, and the office of general counsel can assist in policy design and implementation.

Consider incorporating on the reference request form a waiver statement concerning rights to access. A sample reference request form including a waiver statement is included in Appendix 3 as part of the sample application. Information on FERPA is available on-line at the Family Policy Compliance Office of the Department of Education at:

http://www.ed.gov/offices/OM/ferpa.html

Consider privacy implications as they affect alumni tracking and plans for longitudinal evaluation, especially if the services of a third-party contractor are envisioned.

5.1.5 Organize and execute pre-trip orientation

The pre-trip orientation is an efficient mechanism to distribute information to program participants, and to collect information (for example, final check on program documents and completion of a pre-trip questionnaire, if desired). The pre-trip orientation can be "virtual" by way of an informative Web site operated in much the same way as a distance-learning course; an on-line handbook and readings coupled with e-mail communications comprise the minimal components, and these may be adequate for some programs. During this period, be sure to maintain telephone or e-mail contact with students, and encourage them to communicate in return. Alternatively, the orientation can be a gathering in the United States from which all participants depart for the foreign site, or it can occur several weeks in advance of departure. All approaches have merits and costs; the selection of the most effective and efficient mechanism depends on the size of the program and the geographical distribution of participants. Face-to-face orientations are ideal since they allow efficient transfer of large amounts of information (including necessary paperwork) in a "captive" setting. Orientation meetings include ample opportunities to solicit questions from participants and to provide immediate feedback.

Provide to all participants through advance mailing the supplementary forms that are to be submitted prior to departure (participation contract, health and emergency contact information, *etc*.). Request that these be completed prior to arrival at the orientation, or that they be received at the program office by a specific date. Similarly, ask students to provide any special information needed for program administration (for example, bank routing and account information if the stipend will be delivered by direct deposit). Do not neglect to poll the students regarding individual dietary needs or special medical requirements. International travel with prescription medications and paraphernalia (for example, insulin and hypodermic syringes and needles), may require a physician's prescription or other documentation.

Screen participants for language proficiency, if this is a concern. Use the results of a placement test to estimate instructional needs at the on-site program.

Optimally, include as much host lab placement information as possible for the participants at the orientation meeting; the name and contact information for the assigned host/mentor, and the research topic or field of study, are essential. Contact information (especially e-mail addresses) for past participants, or the use of "advice letters" solicited from this group, adds to the successful preparation of student travelers. Consider inviting program alumni to the orientation program. Their commentaries based on personal experiences will both excite and reassure new student participants.

Begin a virtual introduction of each student participant to his/her intended host by providing a copy of the host's resume, some selected reprints and background information on the proposed student project(s). Add a note of formality and build student confidence in the program by assembling the information in a presentation packet to be delivered at the orientation. Alternatively, ask the host scholar to send these materials directly to the student with an invitation to initiate direct communication. Soliciting these materials early in the cycle stimulates the host to consider seriously the student's role in the foreign laboratory, and in the specific research project. Indeed, the earlier that the student participants know some details about the work the better. Encourage the students to read and to arrive at the international site prepared to begin their projects. All of these strategies reduce the barrier to a quick and effective start. Whereas bringing all international host scientists to the orientation is impractical, one or more foreign scholars can represent the group; they can present an overview to the foreign site facilities and program activities, and they can begin a personal association with the participants.

For many participants, the international REU experience is the first opportunity to travel and to study abroad, or even to venture outside their home state (!). Consequently, students may harbor some apprehension about this academic and scientific "adventure." Include an overview of the foreign culture in the orientation program, especially if the host culture is one to which the participant has probably received little exposure through foreign language coursework or through the anecdotal reports of classmates who have traveled to the region. Do not neglect a frank discussion of "culture shock" as part of the pre-departure exercises or the on-site orientation. Many resources exist to meet this challenge (Section 6.8). Faculty or local scholar-scientists who have worked in the

foreign site can bring interesting and useful commentary to a group presentation. In addition to an overview of an American's life abroad, a scientist or engineer can comment on the scientific, and perhaps academic, infrastructure that the student will encounter. Similarly, scientists visiting the U.S. from the foreign host site (or simply from the foreign country) can offer commentary and practical advice.

Do not neglect to brief the student participants on standards for acceptable dress and behavior, if this is a concern in the host country.

A wealth of print information is available from tourist bureaus; many of these organizations maintain offices in major U.S. cities on the East and West Coasts. Embassies, consulates and foreign trade organizations may be able to assist by providing maps and brochures. City and regional maps, especially, will help students establish an early "connection" with the host site. Encourage every participant to purchase a commercial tourist guidebook for use in his or her individual explorations.

Provide explicit instructions for contacting the participant abroad. A simple guide to international dialing, including telephone number and country and city codes and the time difference for the foreign laboratory or housing site, will be a ready reference to those desiring telephone communication (Section 5.1.2). Include the fax number at the foreign institution, should there be need to transmit documents. Ask student participants to share this information with their families. Include contact information for the program director, as well, should the participant's family need this in the event of emergency.

5.1.6 Elucidate clearly program requirements, goals and expected behaviors

The REU program is a rigorous, research-based study experience, quite different from traditional study abroad programs with which the student may be familiar. Host scientist-engineers invest quite heavily in the program (through both laboratory resources and personal time) and students must accept a substantial degree of participatory engagement and responsibility. Elucidate clearly both program and individual goals. Stipulate in advance any requirements for scientific reporting and program assessment, and for a final written technical report. Inform students early on codes for behavior, policies with respect to alcohol and drug abuse and sexual harassment. If the ages of program participants span the legal drinking age in the foreign host site, directors need to consider carefully their alcohol policy, their ability to enforce it while on site, and reasonable measures to protect the interests of the program, the director and the other student participants. Aside from the responsibilities borne by the program and the director for the overall well-being abroad of participants, some foreign governments severely punish drug law and other violations.

With the advice and assistance of general counsel at the home institution, develop a contractual document to be signed by each participant that outlines a code of behavioral conduct and proscribes the consequences of violations. An example is provided in Appendix 3.

5.1.7 Choose efficient international travel mechanisms

Manage international travel arrangements more simply through effective early planning. The details of international travel will be handled differently if students leave from a common domestic airport, compared with beginning their international travel from their various hometowns throughout the country. A common port of embarkation simplifies the international travel leg since all participants depart as a group; although there may be some added expense, this arrangement is ideal for programs that hold immediate pre-departure orientation sessions. Alternatively, there may be some cost savings if participants travel through the international portal nearest their homes. For greater efficiency and to remove from the director the burden of this management task, assign a program assistant or travel agent the responsibility for travel arrangements. An early query to participants regarding their intended departure and return cities (Appendix 3) saves much time in last-minute follow-ups as tickets are booked; additionally, travel costs can be estimated early in the program's budget cycle.

Do not assume that the student participants have international travel experience. Care is necessary to inform students of travel needs, requirements and restrictions according to country and city destinations; this avoids unnecessary, costly and disruptive misunderstandings and problems. A detailed procedure for arrival on site should be posted on the program Web site and sent to every participant well before departure. Specifically, describe the configuration of the international arrivals lobby of the airport (some airports have on-line maps and terminal plans) and clearly identify a meeting point where a program representative will greet participants. Provide participants with a photograph of the foreign program director or reception person to aide in recognition. Consider asking participants to take shuttle transportation to a nearby hotel with facilities to accommodate a welcome desk or hospitality room. Prepare similar protocols for check-in at participant housing and at the host laboratory. (See Section 6.1)

A good working relationship with a single, qualified travel agent/consultant cannot be understated. In addition to the convenience of a single contact for travel planning, find a travel agent committed to locating the most economical fares for a particular level of service. Be advised, however, that some lower fares carry restrictions regarding itinerary changes and fees may be imposed for changes. If restricted tickets are used, flight insurance is desirable to protect program investments in airfare. Discourage student participants from capriciously changing their itineraries. Medical and family emergencies are legitimate reasons for alterations in travel plans, and flight insurance is a wise investment to protect the budget from these unavoidable circumstances (and, perhaps, in the event of program withdrawal; Section 5.1.14). Economy/coach fares on U.S. flag carriers (wherever possible) are the rule, although in rare cases a participant with special needs (physical disability, for example) necessitates an upgraded class of travel. Upgrades require justification to the project director's sponsored research office. To facilitate participants' interactions with the travel agent, supply the agent with a list of participants including their contact information, departure cities, intended dates of travel and itinerary.

If programs elect to leave travel arrangements to the participant, reimbursement of airfare will entail additional paperwork, or providing additional funds to the student through the allowance mechanism. Provided in this way, participants will be free to manage fully their own itineraries, and use the lowest cost airfare (restricted or not), if they wish. (It may be a beneficial experience for some students to assume this responsibility.) From the program perspective, this can create problems in synchronizing participant arrival at the foreign site. If this model is followed, set a reasonable arrival window at the foreign airport.

No matter which mode is selected, the project director must provide to the foreign host a complete roster of participants with their respective travel information (flight dates and times, flight numbers, originating airports, *etc*.). Then, if flights are delayed or cancelled (due to weather, for example), all parties are able to make and follow informed contingency plans.

Three particular items deserve special note, especially for new project directors. First, early planning and action with respect to international travel cannot be overemphasized. Depending on the international destination and the seasonal nature of some tourist travel, obtaining reservations on popular routes is difficult for a large number of travelers and this can become increasingly so if all participants are to travel as a single contingent. Second, pay careful attention to restrictions on the use of carriers. Most likely, the funding award will carry provisions regarding the use of U.S. flag carriers for project-related travel. The use of non-U.S. flag carriers can be requested on some routes when this is the only available service, or in emergency situations (urgent medical or other evacuation from the foreign site). The Federal Travel Regulations, under 49 U.S.C. 40118 (commonly referred to as the Fly America Act), dictate permissible air carrier use. A plain language version of the Federal Travel Regulations is available on-line at:

http://policyworks.gov/org/main/mt/homepage/mtt/ftr/ftrhp.shtml

Knowledgeable travel staff at sponsored research offices can answer questions as needed. Also, project directors will be expected to purchase only economy class tickets on U.S. carriers for participants and project staff. Travel using other than economy class may be necessary in some circumstances, and requires justification. And third, some universities may dictate competitive bidding procedures for large numbers of ticket purchases; plan early!

Assuring program accessibility to physically disabled individuals may require special travel arrangements (including upgrade to business class air service). Since accessibility standards differ at international sites compared with those in the U.S., carefully examine the foreign site (and other anticipated foreign destinations that may be part of site visit activities) for accessibility. For example, stairs-only access to public transportation is an insurmountable physical barrier for some participants; providing taxi service when necessary removes this impediment to full participation by a disabled student. Survey the foreign site for accessibility, and develop contingency plans (and hold commitments of contingency funding) for challenged participants.

5.1.8 Require emergency contact information

Ask each student participant to complete an emergency contact information form, included as part of the acceptance package sent to participants. Retain original forms in the program office, and provide copies to the project director and to the foreign site director. The emergency contact information form also includes consent-to-treat language, if the director or home institution deems this necessary. Review consent-to-treat language with general counsel at the home institution. Sample forms are presented in Appendix 3.

5.1.9 Seek written parental permission

According to the ages of the participants and following the recommendations of the home institution, parental permission is essential for the student's participation. A separate, signed parental release for international travel by the student may also be desirable. As with emergency contact information and consent-to-treat, parental permission is requested in the acceptance package sent to the participant. Telephone contact with each participant's parent(s) or guardian(s) by the program director can allay parental concerns, should they exist, and may strengthen parental support and encouragement to the student. Discuss issues of parental permission and consent-to-treat with general counsel at the home institution, and with the foreign host institution as well. Sample forms are presented in Appendix 3.

5.1.10 Assist with passports, visas and travel documents

Explore fully the passport and visa requirements for lengthy stays in the foreign locale since the maximum permissible stay without a visa can vary greatly. Coordination with a single consular office simplifies visa processing for the group; make an effort to brief the consular staff in advance. Processing by a single consular office reduces confusion resulting from slight differences in interpretation of rules from consulate to consulate. In some cases, letters of guarantee (or equivalent documents) are required in support of visa applications. Prepare these using a template and send them to participants as part of the program acceptance package with specific instructions for visa application, including the address of the appropriate consulate. Tailor the letter of guarantee to suit the needs of the consulate; typical information includes: name and home contact information of traveler, institutional affiliation, clear statement of the REU site program, dates of formal program activities, contact information for the foreign-side director, and assurance that the traveler's expenses (including return airfare) are provided by the program.

Alert student participants to the typical time required to process a visa application, and encourage them to apply early. U.S. permanent residents who will travel under a foreign passport may have different visa requirements. Use the citizenship information on the application form (Section 5.1.3 and Appendix 3) to anticipate these cases, and be prepared to provide additional documentation in support of visa applications. Build in a flexible budget element to accommodate the costs of visits and permits (Section 4.5.1).

5.1.11 Coordinate visit with U.S. Embassy

Contact the U.S. Embassy in the foreign country regarding the extended visit of undergraduate scholars under the international REU site program. The requirements may vary but, at a minimum, provide Embassy officers with the identity and contact information for the U.S.- and foreign-side program directors and a roster of participants. Additionally, some countries have required procedures for registration of visitors, and the Embassy or Consulate can advise on this matter. If the Embassy has a science officer, extend an invitation for that person to meet the student participants and their mentors; offer the opportunity to attend and speak at the opening ceremony.

5.1.12 Arrange to deliver participant stipend/allowance

The amount of the participant allowance or stipend depends on the nature, duration and site of the REU activity, and on how travel expenses to the foreign site and housing accommodations will be provided. The foreign site director will be instrumental in assembling the budget for the host site support and activities. Since many participants will forego summer employment to participate in the REU activity, this should be factored into the calculation of the allowance.

The mechanism for delivery of the allowance depends strongly on the home organization's sponsored programs and payroll offices, and they should be consulted in this matter. However, there may be some discretionary authority on the part of the director(s) in determining the number and timing of payments. Payments can typically be made as a lump sum or as installments during the program period. The payroll unit can arrange direct deposit of installment payments into a student-participant's bank account; with an automatic teller machine (ATM) bankcard, students can retrieve the funds while abroad. If students are expected to pay individually for transportation expenses, then it is important for the payment (or, at least, the first installment) to reach the student in a timely manner. Similarly, the director may choose to withhold the final payment until all of the reporting requirements are completed (Section 7). The campus sponsored programs office provides important guidance regarding the forms necessary to initiate payment to participants, and the deadline dates for forms submission to assure payment on a particular schedule (many campus systems have a fixed calendar of payment dates, and deadlines for payroll actions). Send the necessary appointment and payroll forms to students as part of the acceptance package.

5.1.13 Insure student participants

Although participants may carry individual insurance of their own, alert them to the possible need for repatriation and medical evacuation and encourage them to look into this special coverage. Refer students to their home university's international studies office for detailed information on insurance companies that provide travel insurance for students. Alternatively, the program may opt to provide an insurance package to its participants, or to require its purchase (and, perhaps, provide the funds for this as part of the student allowance). If the foreign counterpart organization has access to insurance coverage for visiting scholars, explore this option with the foreign host. At the time of

publication, the following companies provide student travel insurance (no endorsement or recommendation is implied):

Council on International Educational Exchange (CIEE)
205 East 42nd Street
New York, NY 10017
http://www.ciee.com/
(This is the organization that provides the International Student ID cards. The cards automatically cover the holder with basic accident/sickness insurance; additional insurance packages are also available through the CIEE.)

HTH Worldwide Insurance Services
12900 Federal Systems Park Drive
Suite 2A
Fairfax, VA 22033-4421 USA
703-322-1515
http://www.higsinc.com/

In some countries, laboratory-related insurance is required; determine these requirements well in advance of student departure for the foreign site (Section 5.2.6). Include the cost of student insurance in the budget request.

For reciprocal programs, the domestic institution may require specific levels and types of insurance coverage for visiting foreign students and scholars.

5.1.14 Establish deadlines and procedures for participant withdrawal

Participant withdrawals at late dates pose a variety of problems—return of a purchased airline ticket and cancellation of foreign housing (perhaps incurring a financial penalty), disappointment of an international host scholar who has already committed laboratory resources and invested intellectually in the mentor-student relationship, and the possibility of running an underenrolled international REU program if an alternate participant cannot be enlisted on short notice.

It is very difficult to enforce deadlines for program withdrawal. A participant contract, carefully drafted, can set the necessary tone regarding the seriousness of commitments by the program and research mentors, and the student. Practically speaking, any reimbursement of financial losses other than return of the unused airline ticket and the participant stipend or allowance will be difficult for the program to realize. There may be legitimate reasons for some withdrawals (medical or family emergency, for example), and care should be taken to distinguish between these unavoidable circumstances and capricious withdrawals (resulting, for example, from shopping around for alternate research programs or summer employment). As discussed above (see Section 5.1.7), flight insurance can be a worthwhile investment to limit the financial impact of a withdrawal, especially in larger programs where the likelihood of a withdrawal event is greater.

5.2 Foreign-side activities

5.2.1 Seek coordination with foreign host institution

Obtain approval for the proposed activity from the foreign host institution as required. This is beneficial for several reasons. Official sanction of the activity adds legitimacy to the project (a factor in considerations of safety and security; see Section 4.5.2 above), and is an important factor in obtaining domestic funds for the program. Formal recognition of the activity by the foreign host institution provides essential groundwork for obtaining support services, including foreign-side funding, access to university facilities, assistance with and priority for on-campus housing arrangements, and access to higher-level foreign administrators for representational appearances at program functions. Recognition by university administration can be a form of reward for foreign researchers that take on the duties of host and mentor without additional compensation.

5.2.2 Identify potential international host scholars

A successful, long-running international REU site program depends on first-rate host researchers. Prior to the host selection process, the domestic and foreign project directors assemble a list of potential host scientists/engineers/scholars. The list will ideally have been assembled and scrutinized earlier in the planning phase of the REU site program (Section 3.1.6), but changes in site staff through time and findings from post-program evaluations call for the regular review of the roster. The roster includes scientists whose research interests match appropriately the needs of the program. Additionally, devise a screening or evaluative "quality control" mechanism to gauge either the demonstrated or potential effectiveness of these individuals as mentors, and their laboratories as successful research and learning environments. Important criteria include:

- successful previous mentorship of undergraduate students (domestic or foreign);
- number of laboratory personnel (associates, post-docs, graduate students, and others);
- accessibility of the host scholar to students;
- size and funding of research program (a measure of how well the host can support the laboratory activities of a visitor); and
- English-speaking ability (if this is a program concern).

Optimally, the foreign site director will know all potential hosts personally and professionally, and can assess their suitability. Recruitment of potential host scholars begins by invitation from the domestic and foreign project directors, but can be expanded at any time to include recommended colleagues of current hosts and even self-nominations. Involve the U.S. program director, if possible, in the recruitment and selection processes.

Solicit from each potential host scholar a short profile of his or her research interests and possible topics for student research. A sample host profile request form is included in Appendix 3. If received in the early stages of project planning, lists of possible student projects can be included in program advertising to engage student interest (Section 5.1.2).

5.2.3 Match host scientists/engineers with students

Begin the matching process at the home institution using the lists of acceptable applicants and available host scholars. Importantly, host availability and the potential for good, specific student-mentor matches contribute to final selection of participants. Engage the international counterpart in the matching process. Expedited delivery of students' applications to the host site(s) is essential for the matching process; this step can be nearly seamless using a Web-based application (Section 5.1.3). The foreign site director reviews the applications, considers possible placements in consultation with individual mentors, and reports his/her impressions to the domestic program director. This step is critical if student placement in specific labs (based on scientific interest and preparation) is a criterion for acceptance to the program.

The host profiles, including possible research topics (Section 5.2.2), together with the applicants' statements of interest and research preferences (Section 5.1.2) are immensely helpful in assigning students to host labs. Use these documents to achieve the best possible student-mentor match.

Notify host scholars and participants as soon as possible of the assigned matches. Provide contact information (e-mail preferably) to both parties and encourage early and vigorous communication (Section 5.1.3).

5.2.4 Organize and execute orientation for foreign host scientists and engineers

Prior to the arrival of participants at the foreign site, convene an orientation meeting to brief host scientists/engineers on the program calendar and administrative aspects of the program. Scheduling conflicts during the course of the program are certain to arise since some hosts will have special plans for themselves or for their students that will be difficult to rearrange (attendance at research conferences, or site visits to other labs). Reduce or avoid these conflicts through early dissemination to the host scientists of a calendar of program activities. Be realistic in your portrayal of which activities are critically important for participants (language lessons or disbursement of in-country allowance, for example) and those that are less important (field trip to a cultural site), and share this information with all program staff. Timely announcement of important dates such as those for the opening and closing ceremonies will pay off in greater host participation. If representation from governmental or host institution offices is desired, be certain to secure their participation as soon as possible through timely invitation.

5.2.5 Secure local accommodations for participants

Arrangement of local accommodations varies according to the host-side organization. When all participants stay at a single site, foreign directors negotiate for student placement in a single dormitory or other residence and arrange payment as a single transaction. When participants are distributed geographically to separate sites, host scientists request guest housing at their respective universities or institutions; payment mechanisms will be more complicated in this case.

Since the academic calendars at some foreign sites differ from those in the U.S. generally, do not rely on the availability of dormitory housing during the full summer vacation period for U.S. students. Resolve or avoid problems through early planning and adjustments in the program calendar where needed. For example, if cultural orientation and language training are planned during the first week of the program but dormitory space is not yet available, consider hosting these activities at another site. Alternatively, plan site visits for the final week, if housing must be vacated before the conclusion of the program.

5.2.6 Review and anticipate special on-site needs

As mentioned earlier (Section 5.1.13), discuss the issue of special laboratory-related student insurance with representatives of the hosting organization(s) since they share some exposure and liability during the extended stays of visitors under a formal program.

If English language textbooks or reference volumes are required, send these ahead when suitable resources are unavailable at the international host site. Field guides for species identification might be critical for an ecology field expedition, as would introductory texts on particle physics at a high-energy physics center.

6. Activities At Foreign Site

6.1 Receive and greet student participants

Arrange and coordinate a reception team to meet students at the airport, or other arrival point. A single program administrator and several student assistants (graduate or undergraduate students from the host labs) can efficiently manage the arrival point reception. Prepare a checklist of needed items and services:

- roster of arriving students, including their itineraries;
- signage to identify the reception area, and nametags for program staff; and
- arrangements for transfer to program site.

For programs where all students have a common embarkation point and destination, consider having someone from the program accompany them in travel. A seasoned traveler can direct the group should problems arise (for example, diversion to another destination due to weather or mechanical problems).

For transport to the program site, consider using a charter bus that can handle program staff, participants and their luggage. Alternatively, if public transportation (bus, tram, or subway) is to be utilized, engage the services of a baggage transfer company to deliver all of the luggage to the program venue. Arriving students will be fatigued, and they will better endure the final segments of their travel without the burden of luggage if economical alternatives are available.

6.2 Introduce students to on-site program, staff and facilities

The first organized activity for participants is a welcoming reception and on-site orientation. Although a pre-departure orientation delivers much advance information, the on-site meeting adds essential practical knowledge about the site and scheduled activities. A 1-to-2 day welcome/orientation meeting usually includes:

- opening and welcome by foreign program director;
- welcoming remarks by institutional and/or Embassy representatives;
- introduction of foreign program staff;
- summary of program calendar with any last-minutes changes (clearly, highlight dates for required group activities and student reporting sessions);
- introduction to foreign site:
    - campus map showing locations of laboratories, housing, dining halls, *etc*.
    - local map of surrounding areas with information on shopping for food and sundries
    - guide to local transportation (especially if housing is located off-site)
    - location of exchange banks and local currency information

  - daily calendar (especially if coursework such as language training is included in the program); and
- introduction to students from host lab.

For a dispersed program at the foreign site, where participants are separated in their laboratories and housing, provide a roster with contact information to facilitate their communication and interaction.

Prepare for each student participant, a wallet card with important contact information (name, address, and work and home telephone and fax numbers) for the individual host scholar and institute, and the American Embassy.

A bus or walking tour of the host city is helpful, but not essential. Combine this with a "kick-off" site visit or industrial tour appropriate to the program's theme, if possible.

6.3 Provide foreign language training or other formal coursework as appropriate

The need for language training or other formal coursework depends on the nature and duration of the program, the language skills of the students and hosts, and the necessity for language skills for daily living and research activities. At a foreign site where little or no English is spoken outside of the host lab, several hours of "survival" language training is most useful. Implement a language training program built on either intensive class work over the first week of the on-site program, or on shorter classes meeting daily or weekly throughout the duration of the program. Explore the availability of language programs through the host institution or, alternatively, through an external contractor; in either case, seek guidance in planning from competent instructors. If the number of student participants is large, discuss with language instructors the optimal language class size. Divide large groups into smaller classes according to speaking proficiency and previous formal training. Evaluate participants' language skills at the pre-departure orientation (or by e-mail through a self-evaluation report); use these results to estimate the number and level of language classes needed. If there is linkage with a domestic program, consider initiating foreign language training prior to departure.

6.4 Organize seminars and colloquia for student participants to discuss and to report on individual projects

Include ample opportunities for students to discuss their research projects with other students and with host scholars. Arrange these opportunities through informal "data presentations" to small groups, and through a more formal gathering (Section 6.7.1). Another means of facilitating exchange is a site visit model wherein each participant provides a short tour of her/his host laboratory to the other participants. If the number of participating students is large, designate sub-groups for this purpose. If the

program uses a distributed host site model, participants will "reunite" during these lab exchanges.

6.5 Emphasize individual research and mentoring

Individual research and mentoring is the scientific focus of the student experience at the foreign site. Execution of this program component hinges strongly on the field of study, foreign site facilities, and program staffing. There is no "one size fits all" program model. Each international REU program is unique and expresses the creative essence of the project director. Overall, however, the organization of the program and of group activities reflects the priority of the students' laboratory work in host labs.

Provide each host scholar with resource materials on mentoring. Hosts will be aware of their responsibilities to the student from the pre-arrival orientation meeting, but reference materials on mentoring will be useful practically, in any event (and especially for first-time mentors). The following short book from the National Academy of Sciences provides a wealth of information on mentoring, and includes clear discussions on the multiple roles of mentors, specific needs of undergraduate students, cultural bias, and diversity issues. For program directors, the book contains a comprehensive listing of additional mentoring resources. The book is available in print and Web-based versions:

National Academy of Sciences 1997. *Advisor, Teacher, Role Model, Friend: On Being a Mentor to Students in Science and Engineering*. National Academy Press: Washington, D.C. 84 pp. ISBN 0-309-06363-9 Available on-line at:

http://www.nap.edu/readingroom/books/mentor/

As part of a mentoring plan, consider the submission of short interim reports by the host scholars to promote honest discussions about the student's research progress.

Encourage U.S. mentors to check on their students. The "home connection" is important for those students traveling abroad for the first time, and problems may be revealed through that link that would go unmentioned otherwise. Mid-term data reporting or program evaluations by participants may also reveal shortcomings. Detected early, many problems can be resolved through mid-course correction (program-level problems) or through intervention by the U.S. or foreign program directors (individual participant problems).

The National Science Foundation offers support to improve undergraduate mentoring. A useful example is the NSF Undergraduate Mentoring in Environmental Biology (UMEB) Program, which serves two intents. First, this activity provides research support for talented students and fosters an enriched and culturally diverse research and educational environment. Second, it enables faculty members to become better mentors through active engagement with students in research. The UMEB program description is available on-line at:

http://www.nsf.gov/bio/progdes/umeb.htm

6.6 Complement individual research work with group activities

6.6.1 Facilitate site visits and other scientific activities appropriate to the international REU site theme

Visits to research and industrial sites build upon the laboratory projects of the group. For example, a site visit to a computer chip R&D or manufacturing facility complements an REU program in electrical engineering. Discuss these outings with host scholars during their orientation meeting; utilize their professional contacts to arrange invitations to desirable facilities. Informal and impromptu site visits for subgroups of students, arranged individually by host scholars, are to be expected. Promote these networking opportunities by allocating modest funds for transportation and incidental expenses.

Guest speakers from other institutes in the foreign country provide refreshing and informative breaks for participants. Select topics for presentation that are central to the group's overall research interest, or choose them from an intersecting research field to add an interdisciplinary element.

6.6.2 Organize cultural and historical site field trips

Field trips to cultural and historical sites are effective "ice-breaking" tools during the first week at the foreign site. Careful selection of sites strengthens the cultural awareness of the participants and introduces them to the surrounding areas. Plan carefully the number and frequency of these field trips so as not to disrupt the productivity of the participants in their laboratory projects. Plan occasional evening outings to museums or cultural events (traditional theater, for example) to limit disruptions to the workday.

6.7 Use formal activities to recognize the program's close

Generally speaking, organize closing activities that comprise more than just a simple farewell reception or a dinner; include the presentation of certificates of achievement to participants. Altogether, for a large group, the closing activities could occupy a full day and might include reporting and evaluation exercises, a recognition ceremony and dinner.

Even if the number of participants is small, devise a formal closing ceremony as visible recognition of the students' efforts and accomplishments. For a very small group of participants, host a luncheon with appropriate university officials or representatives of the sponsoring agency. If participants are scattered among several sites during the program, and unable to spend much time in group-centered activities, the closing ceremony is an opportunity to "re-connect." A "reunion" meeting in the U.S. can substitute for a closing ceremony at the foreign host site.

6.7.1 Require participant reports on individual projects and accomplishments

Participant reporting is a very important component of the international REU site program. The requirement for a final presentation encourages students to continue their strong efforts in the laboratory and to manage their individual projects with that goal in mind. Successful projects include not just experimental design and data collection, but analysis and interpretation of findings, and reporting. Students will enjoy an element of pride, certainly, in a well-done and successful project (although what constitutes a successful project can be quite broad). Since a successful project reflects well on the host lab, engaged mentors share an interest in the outcome of student projects. Finally, experience in oral presentation to a scientific audience is always needed, especially for undergraduates.

Model the format for the student presentations on the typical professional conference for that field. Specifically, some combination of either platform presentations or poster presentations works effectively for groups of almost any size. Because of time constraints, poster presentations are preferable to platform presentations for larger groups. Additionally, poster presentations typically elicit more extensive comments from visitors. If a more formal gathering is desired, pre-select a few of the participants to deliver platform talks as part of a "student research symposium" that includes both posters and oral presentations. Base the selection of speakers on project abstracts submitted by the students or on suggestions from host engineers. Invited remarks from university or agency representatives add a degree of formality to the proceedings.

6.7.2 Conduct exit surveys of participants

Conduct exit surveys on-site prior to departure of the participants. Conducting the survey by mail after the program's close adds unnecessary work and potentially compromises full participation. Some questions are best answered while the international REU experience is still fresh in the minds of the participants, while other questions are better answered after some reflection. Exit surveys reasonably address issues related to daily schedules and time spent in different activities, housing accommodations, the convenience and quality of local support facilities (dining halls and/or restaurants, laundry, *etc*.), and sufficiency of the allowance relative to the actual costs of participation. Reserve other questions relating to the outcome of research projects, to satisfaction with the host and mentor, and to whether initial expectations were met and future career goals affected by the international REU experience for follow-up questionnaires after return home (Section 7.2). Despite the advantages, perhaps, of more considered responses by the participants, it may be hard to achieve good returns once students disperse.

6.7.3 Publicly and formally recognize REU activities at a closing event

Formal closing events add legitimacy in the eyes of the home and host institutions. The closing program is a showcase not only for student research accomplishments, but also for the international REU program and the hosting laboratories. Work to realize some public relations benefit through these more visible

program components, and definitely advertise the event to the local academic and research communities.

Recognize successful participation and research accomplishments in a formal closing ceremony. Offer a printed certificate of accomplishment as a physical reminder of the student's participation; students will display it and make it part of their personal academic portfolios (together with a copy of his/her final technical report). The certificate can be presented by the REU site director(s), or by an official of the hosting institution. A sample certificate is included in Appendix 3. Invite speeches of various sorts, as appropriate to the circumstance, and arrange a formal thanks to the scientific hosts from the participants. Include the closing ceremony as part of a farewell reception or gala dinner.

6.8 Be aware of and recognize culture shock and reverse culture shock

6.8.1 Prepare student travelers for culture shock

Incorporate an overview of culture shock and reverse culture shock into the international REU program agenda. This may have been included as part of a pre-departure orientation (Section 5.1.5) but it is, nevertheless, appropriate to address the phenomenon at the on-site orientation (Section 6.2).

Describe for participants the well-known "U curve of cultural adaptation." A clear understanding of the phases of culture shock—honeymoon (exhilaration), conflict (depression) and recovery (adjustment and balance)—aids students in coping with culture shock and assists program staff in recognizing psychological problems of different underlying natures. Encourage students to keep a journal of their personal experiences and to take photographs, and to correspond with friends and family.

Excellent resource materials exist for program staff and student participants. The following print volumes are useful, but some are intended for a broad audience of travelers (students, established researchers and other professionals):

Black, J.S., and H.B. Gregersen 1999. *So You're Coming Home*. Global Business Publishers: San Diego, CA. 233 pp. ISBN 0-9663180-3-X

Black, J.S., and H.B. Gregersen 1998. *So You're Going Overseas*. Global Business Publishers: San Diego, CA. 201 pp. ISBN 0-9663180-0-5

Carlson, J.S., B.B. Burn, J. Useem and D. Yachimowicz 1990. *Study Abroad: The Experience of American Undergraduates*. Greenwood Press: Westport, CT. 264 pp. ISBN 0-313-27385-5

Storti, C. 2001. *The Art of Coming Home*. Nicholas Brealey Publishing/Intercultural Press: Yarmouth, ME. 203 pp. ISBN 1-85788-297-0

Storti, C. 2001. *The Art of Crossing Cultures, 2nd Edition*. Nicholas Brealey Publishing/Intercultural Press: Yarmouth, ME. 153 pp. ISBN 1-85788-296-2

The following Web-based references are particularly appropriate for student audiences and for international REU program staff:

http://wings.buffalo.edu/studyabroad/shock.html [culture shock]

http://wings.buffalo.edu/studyabroad/rculture.html [reverse culture shock]

http://studyabroad.tamu.edu/travel_reentry.html [reverse culture shock]

http://www.culturegrams.com [culture shock]

6.8.2 Discuss reverse culture shock in a pre-return briefing

Prior to departure from the international site, review with participants their cross-cultural experiences and their management of culture shock. Introduce them to the reverse culture shock that they will individually and variably experience upon return (disengagement from the host lab situation, euphoria upon return to home, alienation among peers, and readjustment to the home culture) and to the coping strategies that exist for them (for example, involvement with international programming and student groups on campus or continued foreign language study). Use the resources listed above (Section 6.8.1).

7. Post-Program Activities

7.1 Require final written technical reports

Clearly explain to students the reporting requirements associated with program participation; distribute reporting instructions at the outset (Section 5.1.5). Quite separate from other evaluation and assessment reports, the final written technical report will summarize the scientific and scholarly accomplishments of the student. Since the final days of the on-site program are occupied in the completion of student projects and in preparation for the student symposium or other presentation, set a reasonable deadline after the formal close of the on-site program for submission of final technical reports, if this cannot be completed before departure. As with evaluation questionnaires, it is difficult to retrieve these reports after the students have dispersed.

Provide clear instructions and format requirements for the final technical reports; include a template for information such as host scholar and laboratory assignment, and individual site visits arranged through the host scholar/engineer. If a published record of the international REU program is envisioned, strict adherence to formatting requirements yields significant timesaving in assembly and publication. In addition to typical technical report elements, include components such as a listing of site visits or special activities.

Student reports have additional uses for REU program directors. The technical reports provide perspective on the effectiveness of host scholars in guiding undergraduates in research. Use summaries and extracted "nuggets" of student accomplishments in annual reports to funding agencies as evidence of international REU site program performance. Compile technical reports into a "yearbook" as a formal record of the REU program, and send this to participants as a memento of their summer experience and for inclusion in their personal academic portfolios, and to university administrators as part of program promotion locally. After appropriate editing and reformatting, post technical reports on the program's Web site as part of the advertising and recruitment campaign (Sections 5.1.1 and 5.1.2).

Enforcing student compliance with reporting requirements is difficult in some cases, especially when students return to a distant home campus. There are few remedies to non-compliance after the students have left the REU program. Follow-up reminders noting the importance of these reports sometimes elicit responses from students. If an installment plan for delivery of the participant allowance is used, consider holding the final payment until the technical report and any other reporting and evaluation documents are submitted.

7.2 Conduct a program evaluation

The program evaluation offers participants and host mentors the opportunity to report their satisfaction with the program. It also provides to REU directors as much as

possible a robust measure of program success, and can lead to important improvements in the program's structure and management.

The evaluation plan for an international REU site program includes: (1) measures to gauge program success in meeting its overall stated objectives and goals, including any integrated academic and research components; (2) mechanisms for assessment from the perspectives of student participants, host scientists/engineers, and program directors; (3) plans for tracking and longitudinal follow-up of student participants with regard to their continued interest and involvement in research and in global issues and collaborations.

In formulating the evaluation plan, include appropriate measures to address the program's success in meeting the broader NSF objectives. Consult the NSF Strategic Plan regarding the Foundation's outcome goals for investments in people, ideas and tools. The NSF Strategic Plan is available on-line at:

http://www.nsf.gov/cgi-bin/getpub?nsf0104

In this broader context, outcome measures for international REU programs might include:

- program success in introducing students to the profession;
- research results and publications;
- student persistence to the baccalaureate and/or Ph.D. degrees;
- student recruitment into science and engineering careers; and
- long-term effects on career decisions.

Careful selection of control groups for comparison is important for a robust evaluation.

As with other program components, a well-developed evaluation plan will strengthen the international REU site proposal during review.

7.2.1 Use evaluation questionnaires

Evaluation questionnaires for student and host researchers reflect the specific REU program for which they are developed, and for reciprocal programs, parallel evaluation instruments should be designed for domestic and foreign students and hosts. Nevertheless, several general categories of evaluation questions are envisioned for student participants in most international REU programs. Student questionnaires address:

- organizational quality and overall experience;
- value of the scientific research component;
- quality of research and/or laboratory facilities;
- quality of individual research guidance and mentorship;
- influence/effect on long-term career planning;
- administration and helpfulness of program administrators;

- usefulness of the pre-trip and on-site orientations;
- quality and value of formal program activities (language instruction, seminars and lectures, site visits);
- quality and value of cultural program; and
- quality of support services (housing, food, transportation).

Samples of evaluation questions for students appear in Appendix 4.

Both quantitative and qualitative data are very useful in assessing the productivity and success of the research component of the student experience. This is a difficult area for assessment over the short term since typical measures of accomplishment such as research presentations at professional meetings and published reports are realized only in the months and years following the conclusion of the actual research work. Whereas these metrics can be collected in longer-term follow-up surveys, more realistic (but more qualitative) short-term measures for productivity by REU program participants are whether data presentations were made to laboratories or work groups at the host site, whether plans exist for the participant to continue his/her collaboration with the host lab or scholar, and whether the research will continue as a senior thesis or independent study project at the student's home institution in the U.S.

Evaluation questionnaires designed for host researchers and mentors address complementary issues relating to host satisfaction. For these instruments, the relevant categories are:

- organizational quality and overall experience;
- value of undergraduate student researcher in the lab generally;
- quality of individual undergraduate scholar;
- helpfulness of program administrators;
- usefulness of the host scientist orientation; and
- willingness to participate in the future.

Samples of evaluation questions for host scholars appear in Appendix 4.

The development of useful evaluation questions is a multi-step process involving: (1) specification of the goals and objectives of the evaluation, (2) identification of the audiences for the evaluation, (3) consideration of the resources available to conduct the evaluation, and (4) formulation and refinement of evaluation questions.

Follow-up questionnaires to those students who were accepted to the program but declined to participate are informative to program directors in diagnosing and correcting such problems as non-competitive allowances (*i.e.*, an applicant accepted a better offer), late date for notification of acceptance (*i.e.*, the applicant accepted another offer before receiving acceptance to this program), or poor match to a host scholar or research project.

7.2.2 Use available resources for designing the program evaluation plan and instruments

Guidelines for the development of a project evaluation plan are available in two NSF publications, both of which are available on the World Wide Web:

Frechtling, J.A. (Ed.) 1993. *User-Friendly Handbook for Project Evaluation: Science, Mathematics, Engineering and Technology Education*. National Science Foundation Publication 93-152. Available on-line at:

http://www.nsf.gov/cgi-bin/getpub?nsf93152

Frechtling, J., and L. Sharp (Eds.) 1997. *User-Friendly Handbook for Mixed Methods Evaluations*. National Science Foundation Publication NSF 97-153. Available on-line at:

http://www.nsf.gov/cgi-bin/getpub?nsf97153

This pair of documents recognizes that both quantitative and qualitative techniques can be combined in a mixed method evaluation to produce the greatest utility in outcome measurement and in program improvement. Although decision makers often demand quantitative measures of results, additional qualitative evidence complements qualitative data and completes the evaluation story. Mixed method evaluation incorporates student and faculty questionnaires, interviews, and the reports of observers. Both of these volumes include annotated bibliographies of technical references.

Another useful handbook of clear guidelines for effective program evaluation is:

Joint Committee on Standards for Educational Evaluation (J.R. Sanders, Chair) 1994. *The Program Evaluation Standards: How to Assess Evaluations of Educational Programs, 2nd Edition*. Sage Publications: Thousand Oaks, CA. 222 pp. ISBN 0-8039-5732-7

This reference manual was prepared by the Joint Committee on Standards for Educational Evaluation, comprising educators and evaluation specialists. It addresses program evaluation in a variety of settings. It is very readable and highly organized. It offers a hands-on approach to educational evaluation, leading the reader through a series of steps from designing the evaluation to collecting and analyzing the data to reporting.

The International Education of Students (IES) Model Assessment Practice is available on-line (together with additional information and materials) at:

http://www.iesabroad.org/menus/ies_MAP.htm

This assessment model, developed by the Institute for the International Education of Students, is a conceptual framework for defining quality in study abroad programs. Four areas are addressed:

- the student learning environment;

- student learning and development of intercultural competence;
- resources for academic student support; and
- program administration and development.

The following article discusses the development of the IES Model Assessment Practice:

Gillespie, J., L.A. Braskamp and D.C. Braskamp 1999. Evaluation and study abroad: developing assessment criteria and practices to promote excellence. *Frontiers: The Interdisciplinary Journal of Study Abroad*, Fall 1999. Available on-line at:

http://www.frontiersjournal.com/back/five/gillespie.htm

http://www.iesabroad.org/info/frontiersarticle.htm

7.2.3 Include a budget for evaluation

Engage the services of an expert in program and project evaluation, and include him/her on the management team. Do not neglect to include this important component of a successful, enduring REU program in the initial budget request.

7.3 Encourage alumni communication

Provide the means for program alumni to stay "connected" with the program and with each other, and use this in program evaluation and recruitment.

7.3.1 Develop an alumni Web site

Consider development of a "program alumni Web site" or a listserv. Make it a useful resource; post participant reports at this site, and provide links to domestic and international research and employment opportunities. Include a directory of alumni, and encourage students to update their contact information after graduation and at intervals thereafter. Use the alumni Web site as one part of the recruiting program and as a resource for new participants preparing to depart (Sections 5.1.1, 5.1.2 and 5.1.4). Enlist a student assistant (perhaps a program alumna or alumnus) to design and maintain the Web site.

7.3.2 Organize reunion meetings

Organize reunion meetings, especially if the program follows a single-institution model and alumni are more likely to stay in residence nearby. Run alumni reunions in parallel with pre-departure orientation meetings and host a mixer where new participants can meet alumni and share practical advice.

8. Overall International REU Site Project Evaluation

Whereas exit surveys and post-program evaluations address REU site performance with regard to student participants and their hosts, longitudinal data are needed to evaluate the program's achievement of its broader overall objectives and goals.

8.1 Conduct longitudinal tracking of participants through follow-up communications and surveys

Longitudinal tracking of student participants with regard to continued interest in their academic field of study, to their career paths, and to the lasting influences of the international research experience offers important insights into the effectiveness of the international REU program. Develop appropriate measures to assess student commitment to and progress in academic programs in the sciences, and to gauge the impact of the international REU program on improved global awareness and cross-cultural competence. Outcome measures include:

- record of publications deriving from international REU participation;
- number and frequency of subsequent visits to the host lab, or to other international facilities;
- frequency of continued communication with the international host scholar;
- participation in a subsequent international REU program in the same or a different field;
- enrollment in a graduate degree program; and
- employment in a "global" industry or company.

Develop the long-term survey instruments in parallel with those for the end of program evaluation to be sure that important items are addressed in one or the other.

Regular, conscientious communication with program alumni facilitates tracking and will prevent lapses leading to loss of contact and low response rates in subsequent surveys. Use the alumni Web site to stay in touch, and use it to issue appeals for help in locating "lost alumni" (Section 7.3.1). Maintaining an up-to-date database of past participants promotes a fast start to longitudinal evaluations.

8.2 Assure accurate financial reporting

In addition to meeting the project director's basic responsibility for fiscal accountability, end-of-program-year financial accounting, reporting and review leads to more efficient program operation. Optimization of program size or of maximum participant capacity has strong financial underpinnings. Apply cost-benefit analysis to individual program components in assessing their value to the program overall. Use the

results of the financial audit to guide the preparation of budget requests in renewal proposals.

8.3 Make course corrections

Altogether, program evaluation guides mid-course corrections, both short-term (over the course of a single program cycle) and long-term (over the lifetime of the program). Successful program staff open-mindedly consider suggestions for change, and thoughtfully adopt changes where indicated. For a new international REU site program director, lessons learned early and the timely resolution of program deficiencies will improve program operation, participant and mentor satisfaction, and long-term success.

9. Acknowledgments

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The Workshop project, and this best practices manual, benefited from the support and advice of staff in the NSF Office of International Science and Engineering. Especially noteworthy in this regard are the efforts of Bonnie Thompson, Rose Gombay and Alexander DeAngelis, with whom the idea began, and Pierre Perrolle, for his encouragement; we are grateful for their steady engagement in the project.

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11. Appendices

APPENDIX 1

WORLD WIDE WEB REFERENCES TO EXISTING INTERNATIONAL RESEARCH EXPERIENCES FOR UNDERGRADUATES (REU), REU-LIKE PROGRAMS AND OTHER PROGRM RESOURCES

NSF REU Program Web site:

http://www.nsf.gov/home/crssprgm/reu/

NSF REU Program Announcement

http://www.nsf.gov/cgi-bin/getpub?nsf01121 (current as of publication date)

Catalog listing of NSF REU site programs

http://www.nsf.gov/home/crssprgm/reu/reulist.htm

NSF Integrative Graduate Education and Research Traineeship Program (IGERT)

http://www.nsf.gov/home/crssprgm/igert/

NSF Research Experience for Teachers (RET)

http://www.nsf.gov/pubs/2001/nsf0118/nsf0118.htm

U.S.-France REU in Chemistry

http://www.chem.ufl.edu/~reu/

U.S.-France REU in Lasers and Optics
http://www.creol.ucf.edu/reu/france.html

REU at CERN Summer Student Program (Switzerland)

http://www.hep.physics.neu.edu/reu_at_cern/

U.S.-Czech Republic REU in Discrete Mathematics and Theoretical Computer Science

http://dimacs.rutgers.edu/REU/

Marine Science and Engineering REU in China

http://www.clarkson.edu/~htshen/reu_china_2001/

Biodiversity of Australia Summer Field Course

http://www.unm.edu/~austral/

Undergraduate Physics Student Research in Beijing
http://lilt.ilstu.edu/intphy/china/

The Nyanza Project: Undergraduate Training in Tropical Lakes (Tanzania)
http://www.geo.arizona.edu/nyanza/index.html

APPENDIX 2

SAMPLE INTERNATIONAL REU PROGRAM TIMELINE*

Month	Program	International Counterpart	Applicant
August	• Advertising program begins (Planning may have to begin earlier if program staff are engaged overseas in the current year program cycle.)	• Confirm potential host scientists and mentors	• Academic year begins • Begin search for REU summer programs
September	• Receive applications • Set up applicant database	• Solicit descriptions of available research topics from host scholars	• Submit application • Request transcripts and letters of reference
October	• Receive applications • Maintain applicant database		• Submit application

Month	Program	International Counterpart	Applicant
November	• Application deadline • Begin application screening (send confirmation of application receipt; follow up on incomplete applications) • Send data on applicant pool to international counterpart director	• Evaluate resource availability to accommodate visiting students (number of discipline-specific host scientists, laboratory and housing space availability, *etc.*) • Send roster of potential host scientists and mentors (including possible research topics) to program office	• Application deadline
December	• Application review • Discuss final participant number with international partner(s)	• Discuss final participant number with program director(s)	
January	• Send tentative acceptance lists to foreign-side program director(s) • Conduct host matching process	• Receive tentative participant acceptance list from program office • Conduct host matching process	

Month	Program	International Counterpart	Applicant
February	• Send notifications of acceptance based on results of host matching process (include request for confirmation of intent to participate) • Begin dialogue with program participants via e-mail/listserv • Send passport and visa information to program participants • Begin airline reservation process	• Send results of matching process to host scientists • Prepare host invitation letters (or letters of guarantee, as appropriate) to support applicants' visa applications • Reserve housing accommodations for confirmed participants • Arrange insurance for student visitors	• Receive notification of acceptance • Send confirmation of intent to participate • Establish communication with host scientist • Apply for passport (as necessary)
March	• Planning visit to host site • Inspect host labs and housing sites • Organize pre-trip orientation	• Review local program and supporting arrangements with visiting program director(s) • Convene introductory meeting between visiting project director and host scholars/mentors	• Begin pre-trip readings • Apply for visa(s) (as necessary)

Month	Program	International Counterpart	Applicant
April	• Pre-trip orientation for participants • Distribute program manual, participation contract, waiver form(s), medical insurance and emergency contact information requests • Obtain student-participant travel information (departure city, travel dates, special needs, *etc.*) • Finalize purchase of airline tickets • Virtual introduction of participants to international host(s)/mentors(s)	• Orientation meeting for host scientists and mentors	• Deadline for withdrawal • Pre-trip orientation • Begin e-mail or other communication with mentor(s) • Follow Web site for program updates

Month	Program	International Counterpart	Applicant
May	• Deliver airline tickets to student travelers • Begin distribution of stipend allowance	• Plan participant reception at airport, and arrange transportation to host site(s)	• Submit signed participation contract and waiver form(s), medical insurance information, emergency contact information • Receive airline tickets and first installment payment of stipend/allowance
June	• Participants depart • Program begins	• Participants arrive Confirm safe arrival of participants at international site • Program begins	• Depart for international site • Confirm safe arrival at foreign site (via international program host) • Program begins
July	• Program status review for mid-course correction(s) (as necessary)	• Review participant progress and submit report status report to program director(s)	• Provide feedback for program status review

Month	Program	International Counterpart	Applicant
August	• Closing activities/ceremony • Exit survey • Program ends • Last payment of stipend/allowance	• Closing activities/ceremony • Program ends	• Closing activities/ceremony • Complete exit survey • Program ends • Complete final report • Receive last installment payment of stipend/allowance
September			
October	• Send follow-up survey/evaluation questionnaire(s) • Solicit pictures for Web site album		• Follow-up survey/evaluation questionnaire(s) • Submit pictures for Web site album
November	• Prepare and submit annual status report to funding agency • Report highlights and new advice for REU reference		

* NOTE: For reciprocal programs, or for programs with linkages to domestic REU site programs, an integrated program plan and corresponding timeline should be devised.

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APPENDIX 3

Sample International REU Program Forms

3.1 International REU Program Application
3.2 Request for Letter of Reference
3.3 Participant Code of Conduct
3.4 Participation Contract, Waiver of Liability, and Assumption of Risk and Indemnity Agreement
3.5 Travel Release
3.6 Health Information Form and Physician's Statement
3.7 Health Insurance and Consent-to-Treat Form
3.8 Travel Information Request Form
3.9 Certificate of Achievement
3.10 Host Scholar Profile

Sample International REU Site Program Application

U.S.-[FOREIGN SITE] Research Experience for Undergraduates (REU)
Department of ABC
XYZ University

POSTMARK DEADLINE FOR SUBMISSION: MM/DD/YYYY

Application Instructions:

1. Complete all sections of the student application and the informational section on the top of each of the recommender forms. Applications should be typewritten.
2. Be certain to include all required information in the spaces provided and to adhere to specific space limitations where noted. Please attach undergraduate academic transcripts to the back of the application form. Unofficial transcripts [ARE/ARE NOT] acceptable.
3. Please sign and date the application on page X.
4. Send the completed application with attached academic transcript(s) to:
   U.S.-[FOREIGN SITE] REU Program
   Department of ABC
   XYZ University
   City, State ZIP
5. Letters of reference from three recommenders should be submitted by the writers directly to the U.S.-[FOREIGN SITE] REU program office at the above address.
6. The postmark deadline for submission of all materials is November 30, 200X.

Applicant Name _____

Institution _____

Academic Department _____

Year in School (as of 11/30/200X) ☐ Sophomore ☐ Junior ☐ Senior

Citizenship Status (check one) ☐ U.S. Citizen ☐ Permanent Resident ☐ Other

If Permanent Resident/Other Country of Citizenship _____

Reference letters requested from:

Name	REU Program Office Use Below
_____	☐ Received (Date _____)
_____	☐ Received (Date _____)
_____	☐ Received (Date _____)

Application to U.S.-[FOREIGN SITE] Research Experience for Undergraduates (REU)
Department of ABC
XYZ University

Applicant Name _____

Institutional Contact Information:

Academic Department _____
Institution _____
Institution Address _____
_____
Telephone _____
Fax _____
E-mail _____

Home Contact Information (during the academic year):

Home Address _____
_____
Telephone _____
Fax _____
E-mail _____

Permanent Home Contact Information: ☐ Same as above

Home Address _____
_____
Telephone _____
Fax _____
E-mail _____

Academic Information:

Academic Major _____

Degree Objective ☐ B.A. ☐ B.S. ☐ Other _____

Expected Graduation Date _____ (as MM/YYYY)

Name of: ☐ Department Chair _____

or

☐ Major Advisor _____

Transcripts Please attach one copy of undergraduate academic transcripts to the back of this application. Transfer students should include transcripts from all undergraduate institutions attended.

Grade Point Average (GPA) Overall GPA _____ Major GPA _____

Letters of Reference:

Applicants should request letters of reference from three individuals able to comment on the applicant's academic background and readiness to participate in a rigorous research experience at an international site. Typically, recommenders will be university faculty or active researchers in the field. Each writer should be provided a copy of the reference request form with completed FERPA waiver section. Recommenders may also find it useful to have a copy of the completed application. Reference letters should be submitted by the writers directly to the U.S.-[FOREIGN SITE] REU program office.

Reference letters requested from:

Name	Affiliation (Department and Institution)
_____	_____
	_____
_____	_____
	_____
_____	_____
	_____

Provide a concise description of your research interests relative to the projects that are available under the U.S.-[FOREIGN SITE] REU Program. State how participation in the REU program will benefit your academic training and how it will further your intended professional career. (Limit your narrative answer to one page.)

Describe your previous research work, and note its relevance to the REU Program theme. State explicitly whether the work you describe was part of an undergraduate independent study or honors project, another REU experience, or a research experience acquired through employment. Do not list organized laboratory coursework at your university, but do be certain that laboratory courses are clearly identified on your transcript(s).

Complete the following table regarding your foreign language training and competence.

		Proficiency (Excellent, Good, Fair)		
Language	Years of Study	Reading	Writing	Speaking

List your previous international travel experience in table below.

Country	Year(s)	Duration	Purpose

How did you learn about this program? Please be a specific as possible (*e.g.*, advertisement through a specific professional society, announcement through a faculty mentor or student club at your school, recommendation from former participant, *etc.*).

Applicant Certification and Signature:

I certify that the information provided in this application to the U.S.-[FOREIGN SITE] REU Program is correct and true to the best of my knowledge.

Applicant's Signature _____

Date _____

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U.S.-[FOREIGN SITE] Research Experience for Undergraduates (REU)
Department of ABC
XYZ University

Sample Reference Request Form

POSTMARK DEADLINE FOR SUBMISSION: MM/DD/YYYY

Applicant Name _____

The Family Educational Rights and Privacy Act (FERPA; 34 C.F.R. Part 99) provides rights and protections regarding the disclosure of records held by educational institutions. These rights and protections apply to documents, files and materials in whatever medium, which contain information related directly to a student and from which a student can be individually identified. By signing the waiver statement below, I waive my right to inspect under FERPA the reference letter solicited herewith. This waiver applies to all future holders of the solicited letter.

☐ **I waive** my right of access to this reference letter.

_____
(Applicant signature and date)

OR

☐ **I do not waive** my right of access to this reference letter. (If waiver statement is unsigned, the student is specifically reserved the right of access to this reference letter.)

_____
(Applicant signature and date)

Recommender Instructions:

1. Please read and complete this reference request form, supplying the information requested below. If you wish to use your own institutional stationery, please attach this completed form to your letter.
2. Please sign and date the reference report where indicated.
3. Please transmit completed form, together with your reference report:

   BY MAIL TO:
   U.S.-[FOREIGN SITE] REU Program
   Department of ABC
   XYZ University
   City, State ZIP

   OR, FAX TO:
   (###) ###-####
   OR, E-MAIL TO:
   abc@xyz-univ.edu
4. The postmark deadline for submission of all materials is November 30, 200X.

[For U.S.-[FOREIGN SITE] REU program information, consult the Web site at: http://…]

Reference Report

Recommender's Name _____

Department _____

Institution _____

Address _____

_____

Telephone _____

Fax _____

E-mail _____

How long, and in what capacity, have you known the applicant?

In specific terms, explain how participation in the U.S-[FOREIGN SITE] REU Program will benefit the applicant in pursuit of his/her academic and professional careers. What unique approaches, opportunities, or skills will the applicant obtain through program participation?

Describe the applicant's potential for academic and professional achievement. Specifically, please comment on the applicant's readiness to conduct scholarly research at an international site under this REU program.

I rank this applicant in the top _____ % of undergraduate students I have known.

Please check one of the two statements below. (The U.S.-[FOREIGN SITE] REU program will honor your request to the extent permitted by law.)

- ☐ My identity and this report must be held in confidence.
- ☐ This report may be released to the applicant upon his/her request.

Recommender's Signature _____

Date _____

Sample Participant Code of Conduct

U.S.-[FOREIGN SITE] Research Experience for Undergraduates (REU)
Department of ABC
XYZ University

Participant Name _____

As a participant in the 200X U.S-[FOREIGN SITE] REU Program (the "Program"):

I agree to conduct myself overall in a manner consistent with my status as a visitor in [FOREIGN SITE], and to abide by local rules and regulations, including those of the national and municipal governments, the host institution and laboratory, and the housing authority.

I agree to abide by the local regulations regarding the consumption of alcohol. Abuse of alcohol will be punished according to local regulations and will, additionally, result in a hearing with Program administrators. Punishment from the Program will reflect the circumstances of the infraction, and will range from formal reprimand to expulsion from the Program.

I agree to refrain from the use and/or possession of drugs (other than prescription drugs used under the care of a physician) during the Program. I understand that violation will result in immediate expulsion from the Program and return to the United States. I further understand that the [FOREIGN SITE] government has a zero tolerance policy with regard to drug smuggling and possession, and that severe penalties can be imposed for violation.

I agree to refrain from sexual harassment of Program participants and staff, and of others. Acts of individuals or of groups that diminish the friendliness of the participants' workplaces and other Program venues, will not be tolerated. Punishment from the Program will reflect the circumstances of the infraction, and will range from formal reprimand to expulsion from the Program.

Applicant Agreement and Signature:

I have read and understand the above code of conduct and penalties for infractions, and I agree to abide by this code during my participation in the 200X U.S.-[FOREIGN SITE] REU Program.

Applicant's Signature _____

Date _____

Return form to U.S.-[FOREIGN SITE] Program Office at: Street, City, State, ZIP
Rev. 03/2002

U.S.-[FOREIGN SITE] Research Experience for Undergraduates
Department of ABC
XYZ University

Sample Participation Contract, Waiver of Liability, Assumption of Risk and Indemnity Agreement

Participant Name _____

In consideration of being given the opportunity to participate in the U.S.-[FOREIGN SITE] Research Experience for Undergraduates (REU) Program ("the Program"), I, for myself, my personal representatives, assigns, heirs, and next of kin:

1. **ACKNOWLEDGE**, agree, and represent that: (a) I have read the participant's code of conduct for the Program, and agree to abide by these rules and regulations for safe participation; and (b) I am qualified and in good health and proper physical condition to participate in the Program.
2. **FULLY UNDERSTAND** that: (a) international study carries with it inherent risks associated with travel outside the United States; (b) there may be other risks and social and economic losses either not known to me or not readily foreseeable at this time; (c) personal medical insurance, including emergency medical evacuation and repatriation services, is my responsibility; and (d) I fully accept and assume all such risks and all responsibility for losses, costs, and damages I incur as a result of my participation in the Program.
3. **AGREE AND WARRANT** that I will examine and inspect each activity in which I will take part and that, if I observe any condition which I consider to be unacceptably hazardous or dangerous, I will notify the proper authority in charge of the Program and will refuse to take part in the activity until the condition is corrected to my satisfaction.
4. **HEREBY RELEASE**, discharge, and covenant not to sue the Regents of XYZ University, the Department of ABC and the officers, employees and agents thereof (each considered one of the "Releasees" herein) from all liability, claims, demands, losses, or damages on my account caused or alleged to be caused in whole or in part by the negligence of the Releasees or otherwise; and I further agree that if, despite this release and waiver of liability, assumption of risk, and indemnity agreement, I, or anyone on my behalf, makes a claim against any of the Releasees, I WILL INDEMNIFY, SAVE, AND HOLD HARMLESS each of the Releasees from any litigation expenses, attorney fees, loss, liability, damage, or cost which may incur as the result of such claim.

_____ _____
Participant's Signature Date

If the participant is under twenty-one (21) years of age, a parent or legal guardian through signature below must also accept the conditions of participation.

_____ _____
Parent's/Guardian's Signature Date

_____
Parent's/Guardian's Name (printed)

U.S.-[FOREIGN SITE] Research Experience for Undergraduates
Department of ABC
XYZ University

Sample Travel Release

Participant Name _____

In consideration of being given the opportunity to participate in the U.S.-[FOREIGN SITE] Research Experience for Undergraduates (REU) Program ("the Program"), I/we, as parent(s)/guardian(s) of the above-named participant:

1. **ACKNOWLEDGE**, agree, and represent that I/we have read the Program description of planned activities in [FOREIGN SITE].
2. **FULLY UNDERSTAND** that: (a) travel outside the United States carries with it inherent risks; (b) international travel is required to participate in the Program; and (c) stops and/or layovers in third countries may be included in the above-named participant's travel itinerary to [FOREIGN SITE], and during his/her return journey
3. **HEREBY RELEASE** and give my/our permission for the above-named participant to travel to [FOREIGN SITE] for the purpose of participation in the Program

If the participant is under twenty-one (21) years of age, a parent or legal guardian through signature below must release and give permission for travel under the Program.

_____ _____
Parent's/Guardian's Signature Date

_____
Parent's/Guardian's Name (printed)

Sample Health Information Form

U.S.-[FOREIGN SITE] Research Experience for Undergraduates (REU)
Department of ABC
XYZ University

Confidential Health Information Form

Participant's Name _____

Date of Birth _____ (mm/dd/yy) Height _____ Weight_____

Health Insurance: All Program participants are required to carry health insurance that covers injury or illness while traveling outside of the United States. See Health Insurance and Consent-to-Treat Form for details.

Do you have or have you had any disease or condition requiring medication, regular physician's care, surgery or other treatment? If yes, please list:

_____

_____

Do you take any medication(s) on a regular, on-going basis? If yes, please list:

_____

_____

Have you ever sought professional help for a psychiatric or emotional problem? If yes, please explain:

_____

_____

Do you have any of the following? If yes, please explain type and severity:

Medication Allergies			NO YES	_____
Food Allergies			NO YES	_____
Other Allergies			NO YES	_____
Asthma	NO	YES	Require epinephrine or hospital?	_____
Diabetes	NO	YES	Require insulin?	_____
Epilepsy	NO	YES	Explain:	_____

Do you have any other health condition that may need to be considered? If yes, explain:

_____

I understand that submission of inaccurate and/or incomplete information about medical and psychiatric health history may result in dismissal from the program. ☐ Yes ☐ No

Participant's Signature _____

Date _____

Physician's Statement (to accompany participant's health information form)

Participant's Name _____

Participant's Address _____

Attention Physician: Your patient is requesting a health evaluation to participate in a [LABORATORY/FIELD] research program in [FOREIGN SITE] this summer. The experience requires [LEVEL OF PHYSICAL ACTIVITY] and presents [DEGREE OF EMOTIONAL CHALLENGE]. Participants must be able to function relatively independently during the [LENGTH OF TIME] duration. Environmental and other conditions the participant may face include, but are not limited to, the following: [LIST].

I examined _____ on _____, 200__.

Listed below are my patient's abnormal findings:

_____

My patient is taking the following medication(s): _____

Medication allergies: _____

Chronic medical conditions: _____

History of psychiatric or emotional problem(s)? ☐ NO ☐ YES If yes, please explain:

_____

Immunization Record:	Primary Series Date(s)	Booster Date(s)
DPT	_____	_____
Tetanus	_____	_____
MMR	_____	_____
Hepatitis A (suggested)	_____	_____
Hepatitis B (suggested)	_____	_____

In my judgment, the following physical or mental conditions are of potential concern for full and successful participation in the Program:

_____

In my opinion, _____ is ☐ **or** is NOT ☐ capable of participating in the described program.

Physician's Signature: _____ Date _____
Phsycian's Name (please print) _____
Street Address _____
City _____ State _____ ZIP _____
Phone _____

Note: The XYZ University medical officer reviews these records. Copies are retained by the on-site coordinator in [FOREIGN SITE] for the duration of the Program.
Rev. 03/2002

Sample Emergency Contact Information and Consent-to-Treat Form

U.S.-[FOREIGN SITE] Research Experience for Undergraduates (REU)
Department of ABC
XYZ University

Participant's Name: _____

Date of Birth: _____ (mm/dd/yy)

Participant's Home Address: _____

_____

Participant's Home Phone: _____

Participant's Emergency Contact Information:

In emergency, please contact: _____

Relationship: _____

Home Phone/Fax: _____

Work Phone/Fax: _____

Alternate Contact: _____

Relationship: _____

Home Phone/Fax: _____

Work Phone/Fax: _____

Personal Physician: _____

Phone/Fax: _____

Medical Insurance (include both domestic and international policies, as appropriate):

Carrier: _____

ID #: _____

Carrier: _____

ID #: _____

Personal Dentist: _____

Phone/Fax: _____

Consent to Treat:

I, the undersigned participant in the U.S.-[FOREIGN SITE] REU Program, if I am unconscious or incapacitated, do consent to emergency medical treatment as recommended by a physician during my participation in the Program. Additionally, I give my permission for Program administrative staff to authorize appropriate emergency medical treatment as recommended by a physician during my participation in the Program. This authorization shall continue in force until the conclusion of the Program on [DATE].

_____ _____

Participant's Signature Date

If the participant is under twenty-one (21) years of age, a parent or legal guardian through signature below must also give their permission for emergency medical treatment under the above conditions.

_____ _____

Parent's/Guardian's Signature Date

_____

Parent's/Guardian's Name (printed)

OR

☐ (check box) I refuse to give my consent to emergency medical treatment as recommended by a physician during my participation in the Program. Furthermore, I refuse to give my permission for Program administrative staff to authorize appropriate emergency medical treatment.

_____ _____

Participant's Signature Date

If the participant is under twenty-one (21) years of age, a parent or legal guardian through signature below must also refuse their permission to treat the participant in the event of a health or medical emergency.

_____ _____

Parent's/Guardian's Signature Date

_____

Parent's/Guardian's Name (printed)

Rev. 03/2002

Sample Travel Information Request Form

U.S.-[FOREIGN SITE] Research Experience for Undergraduates (REU)
Department of ABC
XYZ University

Applicant Name _____

Institutional Contact Information:

Academic Department _____
Institution _____
Institution Address _____
_____
Telephone _____
Fax _____
E-mail _____

Home Contact Information (during the academic year):

Home Address _____
_____
Telephone _____
Fax _____
E-mail _____

Please provide your preferred airport and dates for departure and return; select the airport that is most convenient to either your institutional or home residence before the start of the Program. You must depart from and return to the same airport, and that you must arrive at the international site no later than [DATE]. After the Program office briefs the travel agent with participants' preferences, you will receive instructions on booking your flights.

Domestic Airport for Departure and Return _____
Preferred Date of Departure _____
Preferred Date of Return _____

Rev. 03/2002

U.S.-[FOREIGN SITE] REU Program in Science and Engineering

University of [NAME], U.S.A. and University of [NAME], [FOREIGN SITE]

This certificate of achievement recognizes that

Jane Q. Student

successfully participated in the 2001 U.S.-[FOREIGN SITE] Research Experience for Undergraduates in Science and Engineering conducted jointly between the University of [NAME] Center for Science, U.S.A., and the University of [NAME] Institute of Engineering, [FOREIGN SITE], meeting all program requirements and completing an independent research project in advanced scientific and engineering processes.

Signature

_____

[NAME], Program Director, U.S.A.

[INSTITUTE SEAL]

Signature

_____

[NAME], Program Co-Director, [FOREIGN SITE]

[INSTITUTE SEAL]

Sample Host Scholar Profile

U.S.-[FOREIGN SITE] Research Experience for Undergraduates (REU)
Department of ABC
XYZ University

Host Scholar Name: _____

Academic Rank: _____

Department: _____

Institution: _____

Field of Study: _____

I will be available as a mentor during the Program period of [DATE RANGE].

_____ YES _____ NO If no, dates of availability: _____

Possible Student Research Topics:

(1) _____

_____

(2) _____

_____

(3) _____

_____

Contact Information:

Office/Laboratory Address _____

_____

_____

Telephone _____

Fax _____

E-mail _____

Web Site URL http:// _____

Laboratory Personnel Profile:

_____ Faculty Associates _____ Postdoctoral Scholars

_____ Graduates Students _____ Undergraduate Students

APPENDIX 4

SAMPLE REU PROGRAM EVALUATION QUESTIONS

Many evaluation items can be posed in a form where the individual respondent answers with a numerical rating suitable for statistical treatment. According to individual program needs and the nature of the evaluation questions, rating scales might be presented as satisfaction, agreement, quality, or frequency:

Rating Score	Satisfaction Scale	Agreement Scale	Quality Scale	Frequency Scale
1	Very Satisfied	Strongly Agree	Excellent	Always
2	Satisfied	Agree	Very Good	Frequently
3	Neutral	Neutral	Average	Sometimes
4	Slightly Dissatisfied	Disagree	Below Average	Rarely
5	Dissatisfied	Strongly Disagree	Poor	Never

Most of the items listed on the sample questionnaires use a satisfaction scale to measure the participants' *perceptions* of the effectiveness or usefulness of a particular program or component. The first section on both the student and host scholar/mentor questionnaires solicits ratings of some general or overall program aspects. The remainder of the student questionnaire follows in arrangement the four dimensions of the MAP framework for program evaluation: 1) Student Learning Environment, 2) Student Learning Assessment, 3) Resources for Academic and Student Support, and 4) Program Administration and Development (Institute for International Education of Students [undated]). Finally, there are some open-ended questions on both questionnaires, soliciting qualitative data to assess program effectiveness.

Sample Student Questionnaire

Organizational Quality and Overall Experience	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1 This international REU program was well organized as a whole.	1	2	3	4	5
2 The international component(s) of the program added value to the underlying scientific experience.	1	2	3	4	5

3	The foreign institutional site was well suited to host this program.	1	2	3	4	5
4	This program helped me to improve my research skills.	1	2	3	4	5
5	This program helped me to increase my knowledge in a specific research field.	1	2	3	4	5
6	This program helped me to increase my general scientific knowledge.	1	2	3	4	5
7	I will continue my pursuit of a career in science or engineering as a result of this International REU experience.	1	2	3	4	5
8	I would recommend this program to others.	1	2	3	4	5
9	I would recommend my foreign REU advisor for future projects.	1	2	3	4	5

I. STUDENT LEARNING ENVIRONMENT

Satisfaction With Pre-Trip and On-Site Orientations

How satisfied were you with:		Very Satisfied				Dis-satisfied
1	The information presented during the pre-trip orientation meeting?	1	2	3	4	5
2	The orientation materials sent by mail to prepare you for the program?	1	2	3	4	5
3	The information in the on-line (Web-based) handbook?	1	2	3	4	5
4	The print version of the program handbook?	1	2	3	4	5
5	The information presented during the on-site orientation(s)?	1	2	3	4	5

Satisfaction With Reentry Orientation

How satisfied were you with:	Very Satisfied				Dis-satisfied
1 The information presented after return to the U.S. for help in reintegration into home academic environment?	1	2	3	4	5
2 The information presented about continuing your academic studies in graduate school?	1	2	3	4	5

Quality and Value of Scientific Program

How satisfied were you with:	Very Satisfied				Dis-satisfied
1 The laboratory tours at the host institute?	1	2	3	4	5
2 The lunchtime chalk talks by program mentors?	1	2	3	4	5
3 The weekly seminar presentations by visiting researchers?	1	2	3	4	5
4 The feedback from program mentors on your interim data presentation(s)?	1	2	3	4	5
5 The end-of-program poster project?	1	2	3	4	5

Quality and Value of Cultural Program

How satisfied were you with:	Very Satisfied				Dis-satisfied
1 The "survival" language training classes?	1	2	3	4	5
2 The historical tour of the host city?	1	2	3	4	5
3 The cultural outings and field trips sponsored by the host institutions?	1	2	3	4	5

4	The home stay program?	1	2	3	4	5

II. STUDENT LEARNING ASSESSMENT*

Value of Scientific Research Experience

How satisfied were you with:		Very Satisfied				Dis-satisfied
1	Your individual research project?	1	2	3	4	5
2	The value of your project to your academic career?	1	2	3	4	5
3	The value of your project to your future graduate school or professional career?	1	2	3	4	5
4	The time available for you to complete your individual project?	1	2	3	4	5
5	Your overall academic background and readiness to participate in the program?	1	2	3	4	5
6	Your specific preparation (including recommended coursework) for your overseas research experience?	1	2	3	4	5

Communication Skills

How satisfied were you with:		Very Satisfied				Dis-satisfied
1	The program in preparing you to deliver oral presentation about your research work?	1	2	3	4	5
2	The program in preparing you to conduct scientific research in an international context?	1	2	3	4	5
3	The program in preparing you to work as part of an international research team?	1	2	3	4	5

III. RESOURCES FOR ACADEMIC AND STUDENT SUPPORT

Quality of Individual Research Guidance and Mentorship

How satisfied were you with:	Very Satisfied				Dis-satisfied
1 The guidance provided by your foreign research advisor during your project?	1	2	3	4	5
2 The availability of your foreign advisor when you needed him/her?	1	2	3	4	5
3 Your acceptance into the lab group as a contributing member?	1	2	3	4	5
4 The assistance/advice provided by your foreign (under)graduate student "colleague" in routine matters?	1	2	3	4	5
5 The assistance provided by the host lab in preparing your poster presentation?	1	2	3	4	5

Quality of Research and/or Laboratory Facilities

How satisfied were you with:	Very Satisfied				Dis-satisfied
1 The research facilities at the host institute?	1	2	3	4	5
2 The availability of research facilities to you for your individual research project?	1	2	3	4	5
3 The availability of computer support?	1	2	3	4	5
4 The availability and convenience of access to e-mail and World Wide Web services at the host institute/laboratory?	1	2	3	4	5
5 The availability of adequate library facilities at the host institute/laboratory?	1	2	3	4	5

Quality of Support Services

How satisfied were you with:	Very Satisfied				Dis-satisfied
1 The timeliness of the delivery of your airline ticket?	1	2	3	4	5
2 The timeliness of the disbursement of your participant allowance?	1	2	3	4	5
3 The location of participant housing?	1	2	3	4	5
4 The cleanliness of housing accommodations?	1	2	3	4	5
5 The safety of housing accommodations?	1	2	3	4	5
6 The dining hall food?	1	2	3	4	5
7 The convenience/location of laundry facilities?	1	2	3	4	5

IV. PROGRAM ADMINISTRATION

Administration and Helpfulness of Program Administrators

How satisfied were you with:	Very Satisfied				Dis-satisfied
1 The accuracy of the advertising about the International REU site program?	1	2	3	4	5
2 The information provided by the program Web site?	1	2	3	4	5
3 The application form on the program Web site?	1	2	3	4	5
4 The promptness of responses to your e-mail inquiries?	1	2	3	4	5
5 The appropriateness of your assigned/selected project to your interests?	1	2	3	4	5

6	The appropriateness of your assigned/selected host scholar to your project and interests?	1	2	3	4	5
7	The helpfulness of on-site program staff during the foreign program?	1	2	3	4	5

It is important to have objective measures for assessing student learning outcomes. Here are some suggestions:

- Use a pre-/post-program problem-solving test. Present each student with a problem prior to participation in the REU program, and present the same problem after participation in the program. Real-life case studies and problems built on scenarios of various sorts work particularly well since students have the opportunity to apply their knowledge and skills freely and in various ways to address a given problem at several possible conceptual and intellectual levels.
- Devise a laboratory exercise where students design, execute and/or analyze an experimental solution to a research problem in their field of interest.

Open-Ended/Freeform Questions

1. How did you first hear about the International REU Program?

2. Did you download the application form(s) from the program Web site? YES NO

3. How has your participation in this REU program affected your future career plans or interests?

4. How has your participation in this REU program helped you academically?

5. Are there any specific courses or other projects you are planning in the near future as a result of your REU project?

6. Approximately how many hours per week did you spend with your foreign advisor?

7. Are there courses or experiences that you wish you had before starting this project?

8. Did you consider other REU programs in addition to this one? YES NO

If YES:

What were the important factors in your decision to participate in this program?

What (approximately) was the typical notification date for the other program(s) to which you applied?

What was the value of the stipend in the other program(s)?

9. Would you recommend this REU program to other students? YES NO

Sample Host Scholar/Mentor Questionnaire

Organizational Quality and Overall Experience

How satisfied were you with:	Very Satisfied				Dis-satisfied
1 The organization of this international REU program as a whole?	1	2	3	4	5
2 The expected level of commitment of your time and resources to the program?	1	2	3	4	5
3 Your ability to accommodate the needs of the program within your schedule?	1	2	3	4	5
4 The fulfillment of your expectations for the program?	1	2	3	4	5

Quality of Undergraduate Student Participants and of Student-Host Match

How satisfied were you with:	Very Satisfied				Dis-satisfied
1 The academic qualifications of the student participant assigned to your laboratory?	1	2	3	4	5

2	The work ethic and productivity of the student assigned to your laboratory?	1	2	3	4	5
3	The quality of the student's research results?	1	2	3	4	5
4	The integration of the student visitor into your laboratory group?	1	2	3	4	5
5	The time allotted for the student to complete his/her project?	1	2	3	4	5
6	The appropriateness of the student's research interests to yours?	1	2	3	4	5

Administration and Helpfulness of Program Administrators

How satisfied were you with:		Very Satisfied				Dis-satisfied
1	Your role in the selection of a student researcher to work in your laboratory?	1	2	3	4	5
2	The program's overall management of on-site logistics?	1	2	3	4	5
3	The promptness of responses to your inquiries about the REU program?	1	2	3	4	5
4	The program's management of student housing and allowance disbursement without intervention on your part?	1	2	3	4	5

Usefulness of Host Scholar/Mentor Orientation(s)

How satisfied were you with:		Very Satisfied				Dis-satisfied
1	The pre-arrival orientation meeting(s) for host scholars/mentors?	1	2	3	4	5
2	The information provided to you about the REU program calendar and activities?	1	2	3	4	5

3	The explanation of your responsibilities as a host scholar/mentor, and the resource materials provided to you?	1	2	3	4	5
4	The on-site orientation and your role in the program's opening ceremonies?	1	2	3	4	5

Open-Ended/Freeform Questions

1. How has your participation in this International REU program benefited you and/or your laboratory?

2. Approximately how many hours per week did you spend with your assigned student participant?

3. Are there courses or experiences that you wish your assigned student had before starting his/her project?

4. Would you participate again as a host scholar/mentor? YES NO

5. Would you recommend this program to your colleagues? YES NO

APPENDIX 5

WORKSHOP ON BEST PRACTICES FOR MANAGING INTERNATIONAL REU SITE PROGRAMS

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