Center for Scientific Review
National Institutes of Health

Review Of P41 Applications

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Review Philosophy

The NCRR supports "research resources" in a variety of areas of biomedical science. Applications for such centers are made *via* the P41 funding mechanism, and are reviewed by the Center for Scientific Review (CSR). A resource is centered on technological development, and various aspects of the project must support and make use of the technology. The following information reflects NCRR policy, and should guide review of a research resource application.

Resource Plan

The 5 required components (technological research and development, collaborative research, service, training and dissemination) should be clearly described. Absence of sufficient detail in the written proposal on one or more of these will be detrimental in review of the project (and, in fact, may well provide a sufficient basis for the application to be returned without review).

Research and development is the major resource activity. Research projects can be divided into two categories: Core (technological research and development) and collaborative. Both categories of research are required. The emphasis placed on each research category depends on the goals of the resource and the stage of development of the resource technology and should reflect a balance in terms of the advanced technological needs of the scientific community. While service is one of the key elements of the resource, the P41 mechanism was not designed to support service-only centers.

New applicants are expected to have active research and development core and collaborative research projects at the time of application and to detail their plans for expanding these and adding the service, training, and dissemination components, if not yet established. Investigators submitting continuing competing applications are expected to have all five components in place at the time of application.

a. Technological Research and Development

The reviewers should evaluate whether the resource technology is dynamically evolving, state-of-the-art, an important area for research and development in its own right, and likely to advance the frontiers of biomedical research. The resource technology should not be broadly available by other means. An element of high risk (and potentially high payoff) may be present in one or more of the core projects and is appropriate for this component. Investigators should,

however, present alternative approaches to solving technological problems in the event that their main conceptual thrust should prove unfeasible.

Reviewers should characterize the uniqueness of the NCRR Biomedical Technology (BT) Center's technological goals and the synergy between core and collaborative projects in advancing the focal technology. Reviewers should identify what makes this resource "unique" in the technological goals it is pursuing as well as in the cluster of collaborative projects to which the advanced technology is being applied. In competing continuation requests, reviewers should look for evidence of new meritorious efforts and significant progress during the past grant period.

b. Collaborative Research

The reviewers should determine whether the resource staff is continuously developing new, significant applications of the resource technology in the biomedical sciences through high quality collaborative research projects. The projects served by the new technology should be broad in scope and involve a variety of biomedical research areas.

The resource is expected to be highly responsive to a regional or national user community whose members are primarily grantees and contractors of other NIH programs. It is the applicant's responsibility to identify user communities that both need and will use the research capabilities to be provided by the resource.

Collaborative projects that have already been peer-reviewed should be evaluated on the basis of how they clearly advance and motivate further technological research and development and for the appropriate use and impact of the new technology on the collaborative project itself. Those that have not been peer-reviewed should include more detail and will be evaluated on the scientific merit of the research proposed; however, it is expected that the majority of collaborative projects are independently funded. As indicated below, resource funds cannot be used directly to support collaborative projects; for example, salaries of personnel working on collaborative projects cannot be part of the resource budget.

In competing continuing requests, reviewers should evaluate the balance that has developed between collaboration and technology research and development and between collaboration and service. Reviewers should assess whether collaborative projects are driving core research and whether collaborative projects are making good use of the new technological advances. Long term collaborations may roll over into service projects and new collaborators in important biomedical fields should be actively sought to invigorate the resource.

c. Service

Reviewers should determine if the resource is available to outside users. The equipment and technology utilized for service should be state-of-the-art and should meet significant biomedical research needs. The nature of the service projects should be multicategorical and have a regional or national geographical distribution. For resources that do a substantial amount of service, reviewers should evaluate how costs are shared by the users, including fee for service systems.

d. Training

Reviewers should evaluate, in new applications, the adequacy of plans for providing opportunities for training; and, in competing continuation applications, if there have been reasonable results accruing from these efforts to date. Examples of appropriate training activities include the

individual, special training given to collaborators and service users; training and education on the technology/methodology through hands-on laboratory experience, on-line tutorials, seminars and lectures on a regular basis; and short courses, symposia and workshops on the use of the resource's technology in biomedical research.

Training courses offered by the resource may not constitute a requirement for receipt of an academic degree.

e. Dissemination

The reviewers should evaluate in new applications, the adequacy and appropriateness of the proposed plans; and in competing continuation applications, if there has been reasonable and timely progress in this area. Appropriate dissemination activities involve informing the scientific community about the resource's technology or accomplishments by publishing articles, books, patents, newsletters, annual reports, special issues of technical journals, world wide web pages, and press releases; presenting research results at meetings; conducting conferences; distributing software products; and transferring technologies to industry where they will be distributed widely. In resources that are developing software, reviewers should determine if the software is portable when appropriate, well-documented, user-friendly, and readily available to the user community. Dissemination includes a requirement for outreach to non-expert communities as well as the expert community, to make them aware of the new technology.

f. Administrative and Management

The reviewers should evaluate the administrative and managerial aspects presented in the written proposal. In addition, if a site visit takes place, reviewers should examine the discrete space set aside for the resource and the laboratory facilities, including those available to visiting scientists. In the case of a competing continuing application, the log books recording the hours of usage of the instruments and their idle and down time should be examined. Reviewers should take note of which instruments are in place and operational and which staff members are currently on site.

i. Institutional Commitment

Reviewers should evaluate the institution's commitment to the resource: for example, allocated space, costs associated with alterations and renovations and purchase of instrumentation and computers, and salary support for some resource staff.

ii. Staff Credentials

The reviewers should evaluate the scientific and managerial credentials of the principal investigator and the credentials of other key professional and technical staff.

iii. Resource Advisory Committee

Reviewers should evaluate the role of the advisory committee, or (in proposed resources) plans for the committee (and associated committees such as local executive and medical committees), and whether the members have or will have sufficient breadth and ability to take an effective role in the review and guidance of the resource operations.

g. Scoring

For resource grant applications, each core project in the Technological R&D section should be scored separately. Also, each of the other components of the center, Collaborative Research, Service, Training, and Dissemination should be scored separately. Finally an overall score for the resource grant application should be assigned as shown below. The median score for NIH applications should be about 3.0.

	Score
Technological Research and Development	
Core Project 1	_____
Core Project 2	_____
Core Project 3	_____
Collaborative Research	_____
Service	_____
Training	_____
Dissemination	_____
Overall Score For The Resource	_____

The overall score for the resource is generally not the average of the individual scores but rather should take into account the synergy of the individual components and reflect the individual scores weighted in a balance that is appropriate for the goals of the resource and the stage of development of the resource technology. It should also take into consideration the administrative and management aspects of the resource.

For competitive renewals, the overall score should also reflect an evaluation of the accomplishments and progress of the center during the previous grant period.

Budget

Details of the budget including the length of the grant period should be discussed after the resource application has been finally scored. Percent effort for personnel should be evaluated in the context of their specific contribution to the research of the resource. Graduate student and postdoctoral support can be requested only if they are active participants in a core research project. Requests for individual instruments or for aggregates of instruments should be consistent with the technological goals of the resource and with the projected timetable for technology development as presented in the application.

Activities for which funds may be requested are technological research and development, training, dissemination, advisory committee meetings, and the resource's share of efforts associated with collaborative and service projects. In collaborative and service projects, the outside investigators

must derive their primary support from sources outside the resource grant. Individuals not included in the resource budget who participate in the training experiences may not be paid a stipend.

Specific justifications should be given for equipment requests and for any proposed subcontractual or consortium arrangements. In applications where total annual direct costs excluding equipment exceed the Biomedical Technology (BT) Program's budget ceiling of $700,000, scientific reasons for exceeding the ceiling must be provided in the application. Major equipment requests should include a plan for obtaining funding from other sources should the BT Program be unable to support the full request for equipment. All budget requests that exceed the $700,000 per year ceiling for direct costs, excluding equipment, and/or $500,000 for equipment for the full duration of the grant application must receive a written waiver from the BT area director. The direct recurring costs (excluding equipment) requested for the first year of a competitive renewal application cannot exceed the last year's direct recurring costs budget by more than 20%.

Animals and Human Subjects

All required IRB and IACUC, and other assurances for all research projects should have been submitted with the grant application. Any additional data reviewers request for clarification should be obtained and distributed before the review. The IRB review may be delayed until funding has been approved but must be completed and approvals submitted to NCRR before an award can be made. IACUC approval must be provided within 60 days of the receipt date of the application. The institution applying for the resource is responsible for obtaining overall IRB and IACUC approvals, regardless of whether collaborative projects have separate approvals, perhaps at another institution.

Protection Of Human Subjects From Research Risks: Evaluate the application with reference to the following criteria: risk to subjects, adequacy of protection against risks, potential benefit to the subjects and to others, importance of the knowledge to be gained. (If the applicant fails to address **all** of these elements, notify the SRA immediately to determine if the application should be withdrawn.) If all of the criteria are adequately addressed, and there are no concerns. Write "Acceptable Risks and/or Adequate Protections." A brief explanation is advisable. If one or more criteria are inadequately addressed, write, "Unacceptable Risks and/or Inadequate Protections" and document the actual or potential issues that create the human subjects concern. If the application indicates that the proposed human subjects research is exempt from coverage by the regulations, determine if adequate justification is provided. If the claimed exemption is not justified, indicate "Unacceptable" and explain why you reached this conclusion. Also, if a clinical trial is proposed, evaluate the Data and Safety Monitoring Plan. (If the plan is absent, notify the SRA immediately to determine if the application should withdrawn.) Indicate if the plan is "Acceptable" or "Unacceptable", and, if unacceptable, explain why it is unacceptable.

Gender, Minority And Children Subjects: Public Law 103-43 requires that women and minorities must be included in all NIH-supported clinical research projects involving human subjects unless a clear and compelling rationale establishes that inclusion is inappropriate with respect to the health of the subjects or the purpose of the research. NIH requires that children (individuals under the age of 21) of all ages be involved in all human subjects research supported by the NIH unless there are scientific or ethical reasons for excluding them. Each project involving human subjects must be assigned a code using the categories "1" to "5" below. Category 5 for minority representation in the project means that only foreign subjects are in the study population (no U.S. subjects). If the study uses both then use codes 1 thru 4. Examine whether the minority and gender characteristics of

the sample are scientifically acceptable, consistent with the aims of the project, and comply with NIH policy. For each category, determine if the proposed subject recruitment targets are "A" (acceptable) or "U" (unacceptable). If you rate the sample as "U", consider this feature a weakness in the research design and reflect it in the overall score. Explain the reasons for the recommended codes; this is particularly critical for any item coded "U".

Category	Gender (G)	Minority (M)	Children (C)
1	Both Genders	Minority & non-minority	Children & adults
2	Only Women	Only minority	Only children
3	Only Men	Only non-minority	No children included
4	Gender Unknown	Minority representation unknown	Representation of children unknown
5		Only Foreign Subjects	

NOTE: To the degree that acceptability or unacceptability affects the investigator's approach to the proposed research, such comments should appear under "Approach" in the five major review criteria above, and should be factored into the score as appropriate.

- **Animal Welfare**: Express any comments or concerns about the appropriateness of the responses to the five required points (*See* instructions to NIH application Form 398), especially whether the procedures will be limited to those that are unavoidable for the conduct of scientifically sound research.

Biohazards: Note any materials or procedures that are potentially hazardous to research personnel and indicate whether the protection proposed will be adequate.