Writing a shared instrumentation grant (successfully)

Ken Dunn, PhD
Scientific Director
Indiana Center for Biological Microscopy
Indiana University Medical Center

Shared Instrumentation Grant Program (S10)

- Encourages applications from groups of NIH-supported investigators to purchase or upgrade commercially available instruments that cost $50,000 to $600,000

- A single instrument, and accessories – not a bunch of different things.

- Ask for everything you need, but don't pad it to $500K.

- Buy a new thing, replace an old thing

- Reviewers should not evaluate the scientific merit of the research project components, because these have been previously peer reviewed.

- Technically true, but the S10 is also evaluated according to "impact"

- Funds should be expended expeditiously, within 18 to 24 months from the date of award.

- High-End – A single major item of equipment to be used for biomedical research that costs $600,000 to $8,000,000. Instruments in this category include, but are not limited to, structural and functional imaging systems, macromolecular NMR spectrometers, high-resolution mass spectrometers, cryoelectron microscopes and supercomputers

Shared Instrumentation Grant Program (S10) - Eligibility

- Eligible Institutions/Organizations.   Eligible institutions include domestic non-profit organizations, public or private institutions such as universities, colleges and hospitals.

- Eligible Project Directors/Principal Investigators (PDs/PIs). Each applicant institution must propose a Principal Investigator who can assume administrative/scientific oversight responsibility for the instrumentation requested.

- Eligible principal investigators include any technically qualified research scientist. This person need not be an NIH grantee but must be affiliated with the applicant institution and registered on the eRA Commons.

- PI needs to have credentials that indicate expertise with instrument.

- Multiple Principal Investigators are not allowed under the S10 mechanism.

- To be eligible to apply, three or more NIH funded investigators (Principal Investigators of active P01, R01, U01, R35, R37, DP1 or DP2 research grants) who will be users of the requested instruments must be identified. (Principal Investigators on NIH peer reviewed research grants at the time of the application and award).

- Three is a bare minimum, but don't go so high that it threatens efficiency.

- Major users can be individual researchers, or a group of investigators within the same department or from several departments at the applicant institution. NIH extramural awardees from other nearby institutions may also be included

- They like supporting surrounding institutions, but question value if it involves getting into a car to use the instrument.

- Once this eligibility requirement has been met, additional users with other types of active NIH research grants (such as but not limited to R03, R21, R55, P30, P41, P50) mechanisms can be added as major or minor users. (NIH training grants and contracts are not eligible).

- The projects supported by NIH research grants should together require at least 75 percent of instrument time. The major user group should require at least 35 percent of total usage time.

- If your major users account for 35%, maybe you should reconsider your "major users"

Shared Instrumentation Grant Program (S10) – Equipment documentation

- Describe the instrument requested including manufacturer and model number. The model chosen should be justified by comparing its performance with other available instruments where appropriate. Specific features and any accessories should be justified, both in this section and in the description of research projects.

- Demonstrate a thorough understanding of performance features, design choices and differences between systems. This is where you show expertise.

- Provide a detailed budget breakdown of the main equipment and accessories requested including tax and import duties, if applicable. An itemized quote from a vendor should be included.

- In the end, you don't need to buy the actual instrument that you describe …

- If human or infectious materials, which could create a potential biohazard, are to be analyzed, funds for accessory containment equipment for the instrument may be requested in the budget. In this case, a signed letter from the institutional biosafety committee stating that they have reviewed the proposed containment plan and that the plan adheres to documented biosafety regulations is required in the application.

Shared Instrumentation Grant (S10) – Justification of Need – 9 pages

- Describe and justify the instrument requested.   Compare to alternatives available on the market.
- In particular describe what it does that your users' group needs.
- Justify specific features.   Each accessory must be used by at least half of major users.

- Inventory similar instruments existing at the applicant institution, neighboring research institutions, or otherwise accessible; describe why they are unavailable or inappropriate for the proposed research. Document "unavailability with a letter.
- Do an exhaustive survey of any instrument that might remotely serve the purpose of the proposed instrument. Disarm anyone on the committee who thinks otherwise.

- Include specific documentation on the current usage and downtime of existing instruments and estimate of the projected usage for the requested instrument.
- Again, if replacing an instrument, document use of the previous instrument. For any instrument, estimate projected number of hours for each major user, minor NIH-funded users and other users.

- Defined and justify Accessible User Time, the number of hours the instrument can be used.

Shared Instrumentation Grant Program (S10) – Justification of Need - continued

- The application should also show a clear need for the instrumentation by projects supported by multiple NIH peer reviewed research grants (including, but not limited to those listed above) and demonstrate that these projects will require at least 75 percent of the total usage of the instrument.

- This would be a good place for a table – investigator, user category (major, minor, unfunded), grant number, how the instrument would be used and for how many hours.

- These grants can be annoyingly long, and so reviewers appreciate summary tables that they can use to establish a simple overview.

- The most important thing here is that the proposal has to make an ironclad case that the research of each investigator would be significantly enhanced by capabilities ACTUALLY provided by the proposed system, capabilities that are beyond those of instruments currently available to the researchers.

Shared Instrumentation Grant Program (S10) – Justification of Need

Review Criteria.

The review committee will consider the following criteria:

- Will the instrument requested have a significant impact on biomedical/behavioral research and contribute to the advancement of human health?
- Is the need for the instrument clearly and adequately justified?
- Are all features and accessories justified by their need by Major Users?
- Is Accessible User Time well defined?

Shared Instrumentation Grant (S10) – Technical Expertise – 3 pages

- Describe the technical expertise present at the institution to set up, run and maintain the instrument.
- This includes the PI, the people who will be actually using and maintaining the microscope and the PIs of the major, and to a lesser extent, minor user groups.
- The narrative of the proposal and the research projects does more to establish the expertise than any effusive descriptions of the personnel.
- Specify who will operate the instrument, train new users, and ensure that it is operated safely and appropriately maintained.
- The more complex the technology, the more important to establish how the necessary expertise will be developed for all of the users groups.

- Address how technical support for sample preparation and data interpretation is handled.
- Having experienced people working from a core facility can be a real strength here.

Shared Instrumentation Grant Program (S10) – Technical Expertise

Core Review Criteria

- Does the institution have the technical expertise to make effective use of the requested equipment?

- How well qualified are the participating investigators to operate and maintain the instrument, conduct the projects, and evaluate the research results?

- How will new users be trained?

- How will biosafety procedures be implemented?

Shared Instrumentation Grant (S10) – Research Projects – 30 pages

- Give a brief description of the major users' projects.   Because the projects have been previously peer reviewed, the project descriptions should be concise and focus on the benefit of the instrument to the research objectives of each user.
- This is hard – you'll need the investigators to write the project descriptions and explain why they need the instrument. You'll need to go through this text, limit the text to the relevant imaging aspects, see if the argument for the instrument makes sense, ideally put it into some kind of cohesive form with a consistent argument. You may lose some of your major user group here.
- Sufficient technical detail should be included within the research plan to evaluate whether the instrument is appropriate, would be effectively employed, and would provide advantages over other methods.
- They'll claim otherwise, but if you've got the opportunity to collect preliminary data, you've got to do it. Data need to demonstrate that the system, when used in a way impossible with current instruments actually generates the data you claim to need.
- The need for special features and accessories must be justified. Special features must be needed by at least half of major users.
- Use of these special features should be highlighted in the narrative, and included in a table.

Shared Instrumentation Grant Program (S10) – Research Projects - continued

- If possible, each user should highlight those publications that demonstrate the user's expertise in using the requested instrumentation.
- These need to be someplace more prominent than the biosketch, but also highlighted in the biosketch for those reviewers who check.
- 30 page limit for Research projects, up to 6 pages for any one major user (recommend three pages or less). For minor users, only include a very brief summary of the research related to the need for the instruments.
- Resist the temptation to overwhelm reviewers with detail. This may mean that you need to go through someone else's text with a broad sword, probably someone more important than you.
- By the time the reviewers are finished reading the research projects, they need to believe that each member the group has a real need for the instrument – that the instrument ACTUALLY provides capabilities that will advance their research, capabilities unavailable on systems currently available to them.

Shared Instrumentation Grant Program (S10) – Research Projects

Core Review Criteria

- Will research with the requested instrument advance the knowledge and understanding of the proposed projects?

- How would the research project of each major user be enhanced?

- Do users justify requested instruments for specific projects?

- Do at least half of major users need requested accessories?

- You need to judge the need for and appropriateness of the requested instrumentation, not the research itself; these latter judgments have been rendered by other Study Sections.

Shared Instrumentation Grant (S10) – Institutional Commitment – 3 pages

- One member of advisory committee who represents financial commitment of institution.
- Describe the institutional infrastructure (space, environment and utilities) available to support the instrumentation.
- Describe and confirm institutional support for maintenance and operation of the instrument.
- Confirm that the institution will provide backup for the financial plan for 5 years.
- Provide letter from institution describing previous S10 awards and their management
- Matching funds are not required

In practice, the committee wants the institution to have "some skin in the game". Best is real matching funds, not just continued support of personnel who are already supported. You can pitch institutional commitment in terms of the space and salary support your facility is receiving, but nobody has respect for it. Also, don't bother with vague letters from institutional representatives.

Shared Instrumentation Grant Program (S10) – Institutional Commitment

Core Review Criteria

- Did the institution provide required letter of commitment to backup the financial plan?

- Is the backup plan sufficient for the expected lifetime of the equipment?

- Has the institution provided letter describing previous S10 awards?

- Is the management of awarded S10 instruments sufficient?

- Is institutional infrastructure (technical support, space, environment and utilities) available to support the instrument?

Shared Instrumentation Grant (S10) – Administration – 6 pages

- Describe the organizational plan for administering the grant. Describe day-to-day management. Who will operate and maintain the instrument.
- You need to convince the reviewers that you can take care of the instrument.
- Include how the instrument will be utilized, how requests are made, how time will be allocated to competing research projects and how schedules are posted.
- This really is scrutinized – the critical determinant for a subset of reviewers.
- Describe plans for attracting new users
- This is actually important – you want to convince that use will grow with time.
- Submit a specific financial plan for long-term operation and maintenance. Must include plans for year one, years 2-5 strongly recommended.
- You probably need a recharge system to make a credible case. And include realistic estimates of income and costs. And have them equal one another.
- Specify the plans for fully funding the instrument. Specify the sources and amounts of additional needed funds (private, state or institutional funds) and a projection of when they will be available. Provide documentation (separate letters signed by appropriate institutional officials).
- This is where the "matching funds" come into play. Letters need to be very specific.
- List names and titles of broadly-based Advisory committee. Include institutional official to represent financial commitment. Describe plan for regular meetings.

Shared Instrumentation Grant Program (S10) – Administration

Core Review Criteria

- Is the plan for the management and maintenance of the requested instrument appropriate?

- Is the financial plan for fully funding the purchase and long-term operation and maintenance of the instrument reasonable?

- Is the membership of the advisory committee broadly based to oversee the use of the instrument and to provide oversight of the instrument including sharing arrangements? ?

- How will research time be allocated among the projects? Are the sharing arrangements equitable?

- If needed, are the policies to manage human subject, animal or biohazardous materials projects adequate?