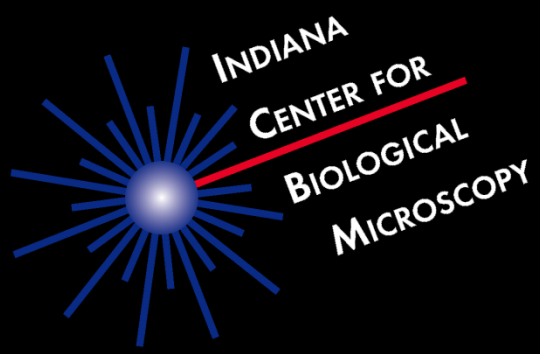

Writing a shared instrumentation grant (successfully)

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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
- Ask for everything you need, but don't pad it to $600K.

- The SIG Program provides funds to purchase or upgrade a single item of expensive, state-of-the-art, specialized, commercially available instrument or an integrated instrumentation system. An integrated instrumentation system is one in which the components, when used in conjunction with one another, perform a function that no single component could provide. The components must be dedicated to the system and not used independently.
- A single instrument, and accessories – not a bunch of different things.
- Buy a new thing, replace an old thing

- To promote cost effectiveness, to encourage optimal sharing among individual investigators, research groups and departments, and to foster a collaborative multidisciplinary environment, the instrument should be integrated in a core facility, whenever possible.

Shared Instrumentation Grant Program (S10) - Eligibility

- Eligible Institutions/Organizations. Eligible institutions include institutions of higher education and domestic non-profit organizations.

- 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.

- The PD/PI chosen for this application should have documented (in the biographical sketch) technical expertise directly related to the type of the chosen instrument. The PD/PI does not need to have an NIH research grant or any other research support, but is expected to be an expert on the requested instrument. The PD/PI may be a Core director, tenured, or non-tenured faculty member of the applicant organization. The PD/PI must be affiliated with the applicant organization and must be registered on eRA Commons.
- PI needs to have credentials that indicate expertise with instrument.

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

Shared Instrumentation Grant Program (S10) – Eligibility (continued)

- Three Major Users who have substantial need for the instrument must be identified. Each Major User must be a PD/PI on a distinct active NIH research award in an area of basic, translational, or clinical research.
- Three is a bare minimum, but don't go so high that it threatens efficiency.

- PDs/PIs on NIH training or fellowship grants (i.e., T and F mechanisms) and other non-research grants are not eligible to be Major Users.

- Once this eligibility requirement of three Major Users with NIH-funded research projects has been met, additional users with active research awards from NIH or other sources may be added as Major or Minor Users.

- Investigators with funding from sources such as other Federal agencies (e.g., NSF, DoE, DoD), private foundations or academic institutions can be added as Major Users, provided they are engaged in basic, translational or clinical research and can demonstrate a substantial need for the instrument.

Shared Instrumentation Grant Program (S10) – Eligibility (continued)

- Major Users can be researchers from the same department or from several departments, divisions or schools at the applicant institution, or from nearby or regional institutions. In certain circumstances, as technology dictates, Major Users may come from distant institutions, but they must demonstrate the need for the instruments and describe plans for regular access to the instrument.
- They like supporting surrounding institutions, but question value if it involves getting into a car to use the instrument.

- To demonstrate the clear need for the requested instrument, the projects supported by NIH research grants should together require at least 75 percent of the Accessible User Time (AUT) – see Section IV.2 Other Project Information for the definition of AUT. Major Users supported by NIH grants should together require at least 35 percent of the AUT.
- If your major users account for 35%, maybe you should reconsider your "major users"

- The Major User group must meet the eligibility requirement at the time of submission. In addition, if/when the application is considered for funding, the SIG Program Staff will check that the Major User group eligibility requirement is also met at the time of award.

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

- Compare performance of the requested model with other similar instruments available on the market.
- In particular describe what it does that your users' group needs.

- Justify the need for specific features and special accessories. Each such accessory must be utilized by at least three Major Users. Explain why the chosen model and its manufacturer are the most suitable for your user group.

- Preliminary data are not required, though if feasible, you may include preliminary data to justify your choice.

- Provide an inventory of similar instruments existing at your institution, neighboring research institutions; describe why each similar instrument is unavailable or inappropriate for the proposed research. If similar instruments are listed as "unavailable," add a letter to the Letters of Support section from the instrument manager explaining why the instrument is not available to your user group.
- 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.

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

- Include specific documentation on the current usage and downtime of each of these existing instruments in annual hours and a realistic estimate of the projected usage for the requested instrument. You may use tables to clarify the presentation. Tables included within this section will count towards the specified page limit.
- Again, if replacing an instrument, document use of the previous instrument. For any instrument, estimate projected number of hours for each major user and other users.

- For the requested instrument, define and justify the Accessible User Time (AUT) which is the number of annual hours the instrument can be used for any research purpose. AUT hours may be limited by the times an instrument operator is available (if an operator is required), site or building access schedules, estimated or scheduled maintenance, start-up and standardization, and any other factors that take time away from the use of the instrument.

Shared Instrumentation Grant Program (S10) – Justification of Need

The review committee will consider the following criteria:

- Reviewers will provide an overall benefit score to reflect their assessment of the likelihood that the requested instrument will exert a sustained, powerful influence on the conduct of research projects and their scientific outcomes, in consideration of the following review criteria.
- Is the need for the instrument clearly and adequately justified? Is the equipment essential and appropriate?
- Are all specific features and special accessories of the requested instrument well justified; in particular, by their need of Major Users? Justification of selection of the proposed instrument may include, but is not limited to, comparison with other commercially available instruments of similar function.
- Is Accessible User Time (AUT) reasonable, well defined and explained?

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

- Describe the technical expertise of individuals who will set up and run 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. If the instrument requires complex sample preparation or consultation for experimental designs, describe the expert individuals who will serve in that capacity. Address technical support for data collection, management, and analysis.
- The more complex the technology, the more important to establish how the necessary expertise will be developed for all of the users groups.
- 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 or other assigned personnel to operate and maintain the instrument, conduct the projects, and evaluate the research results, including analysis and interpretation of data?
- How will new users be trained?
- How will biosafety procedures be implemented?

Shared Instrumentation Grant Program (S10) – Research Projects – 30 page limit

- You must focus this Research Projects section on detailed explanation of how the requested instrument will advance research projects.
- Demonstrate that NIH-funded investigators will use the instrument at the level of at least 75% of AUT.
- All major users must have substantial need for the requested instrument. Use up to 4 pages to describe research for any one major user (recommend three pages or less).
- 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.
- You can divide this section into subsections Research Projects of Major Users or Specific Research Topics. The latter format may be useful to avoid redundancies in the presentation of research projects if several Major Users follow similar protocols and scientific benefits of the new instrument for their projects are comparable.
- Note that this may be complicated by the 4 page limit per project.

Shared Instrumentation Grant Program (S10) – Research Projects – 30 page limit

- Give a brief description of the major users' projects. Since the projects have been previously peer reviewed, describe their details only as necessary to explain how the requested instrument will advance the projects' research objectives. Present sufficient technical details about types of samples or specific experimental protocols to be employed to allow evaluation of whether the instrument is appropriate, would be effectively utilized, and would provide advantages over other methods and other similar existing or new instruments.
- 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.
- 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 – 30 page limit

- In particular, explain the need for special features and accessories of the requested instrument by describing the specific studies that will utilize these options as at least three Major Users must need any of these special options.
- Much of this will go into 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. Direct the reviewer to the tables.
- 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.

- 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.

Shared Instrumentation Grant Program (S10) – Research Projects – 30 page limit

- Preliminary data are not required, but if available, they may be used to illustrate the benefit of the requested instrument to the research projects.

- 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.

- Describe how generated data will be handled and analyzed so that benefits of the entire experimental set-up can be judged. Summarize benefits that the requested instrument will provide towards answering specific scientific questions. Be succinct and clear.

Shared Instrumentation Grant Program (S10) – Research Projects – 30 page limit

- Conclude the Research Projects section with a subsection on Minor Users' Projects to describe the need of the requested instrument to advance projects from Minor Users and the user community at your institution (e.g., unfunded users who have significant need for the instrument to develop their research programs or users whose expected needs are at the level of 1% or less of AUT).

- 4 page limit for the ENTIRE section on the research projects of minor users

- In cases of certain technologies, a large number of users, exceeding what is necessary to make a strong case for the need of the instrument, may be expected. In such cases, you may select a representative smaller group of Major Users and describe their research projects' needs in detail in subsections Research Projects of Major Users. Then, devote a separate subsection Other Users' Projects to describe research and instrumentation needs of your large user community, including Minor Users'. Keep in mind that the sole number of users is not a compelling factor to justify scientific needs for the requested instrument.

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 will the research projects of individual Users be enhanced?
- Do Users adequately justify the requested instrument for the needs of their specific projects?
- If accessories are requested for the instrument, do at least three Major Users require each of the accessories for their research projects?
- 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 Program (S10) – Summary Tables – 6 pages total

As a reminder, state AUT in annual hours, as introduced in the Justification of Need Section. Then, show a table summarizing Research Projects of Users. The table should have the following columns:

- User's name
- Grant number (for NIH awards list the grant numbers as R01IC123456),
- Brief title of the project
- Grant start and end dates
- Estimated percentage of AUT hours.
- If there are multiple Users funded by the same grant, list a total of their estimated percentage of AUT hours of use of the instrument for projects supported by that grant.

In addition, make a separate table to indicate the users' needs for any requested accessories.

Do not list users whose annual usage is at the level of 1% or less of AUT.

Shared Instrumentation Grant (S10) – Administration – 6 pages

- Organizational/Management Plan: Describe how the instrument will be utilized, how requests to use the instrument will be made, how time will be allocated among Major Users, how other projects and new users will be enlisted.
- This really is scrutinized – the critical determinant for a subset of reviewers.
- New users are actually important – to convince that use will grow with time.

- Describe how users will be trained in experimental design, instrument operation and data analysis.
- You need to convince the reviewers that you can help investigators effectively exploit complex technology.

- Describe typical day-by-day management of the instrument.
- You need to convince the reviewers that you can take care of the instrument.

- Describe a plan for managing access to the instrument if users' projects involve human subjects, vertebrate animals or biohazards such as infectious materials.

Shared Instrumentation Grant (S10) – Administration – 6 pages

- Submit a specific financial plan for long-term operation and maintenance of the instrument. Explain how various operational costs will be met; specifically, costs associated with routine operation and maintenance of the instrument, and costs for support personnel.
- Typically, during year one, the maintenance costs are fully covered by one year manufacturer's warranty. In subsequent years, costs of maintenance must be considered in the financial plan. The financial plan *must* include a table for year one of operation with approximate dollars for anticipated expenditures and anticipated income, showing how these estimates were derived. For year one specific dollar amount are required; for years 2 - 5 approximate amounts are recommended. Include a description of projected changes of the financial plan over the subsequent four years.
- 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.

Shared Instrumentation Grant (S10) – Administration – 6 pages

Elements of the budget for ongoing support:

- *Operation:* Include salary support of expert personnel that will operate the instrument and oversee routine care and procedures for standardization.
- *Maintenance:* May include a service contract, or funds for parts and local technical personnel who will maintain the instrument (if personnel are qualified to do so).
- *Supplies:* Include necessary supplies for operating the instrument such as chemicals, cryogenics, and other expendable items.
- *Anticipated Income:* Enumerate the sources of income such as charge back fee structure, grants, or institutional support.

Shared Instrumentation Grant (S10) – Administration – 6 pages

- List the names and titles of the members of the local Advisory Committee. The membership of this Committee should be broad to balance interests of different users and should include members without conflicts of interest (non-users of the requested instrument) who can resolve disputes, if they arise.
- The membership of this Committee should include at least one senior institutional official who will represent the financial commitment of the institution.
- Major and other active Users of the instrument may be members, but none may Chair the Advisory Committee.
- The PD/PI cannot be a voting member of the Advisory Committee.
- The Advisory Committee should meet on a regular basis and should prepare an annual report, which will become part of the Final Progress Report and the Annual Usage Reports (see Section VI.3).

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 for the appropriate range of biomedical investigators, to balance interests of different users, and to resolve disputes, if they arise?
- 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?
- Is the financial plan for the instrument for five years or the expected lifetime of the instrument reasonable and secured, balancing anticipated expenditures and anticipated income?
- Is the expected usable lifetime of the instrument reasonable?

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.
- Confirm the institutional support toward the maintenance and operation of the instrument. In particular, confirm that the institution will commit to provide backup of the financial plan for five years from installation of the instrument or for its effective/usable lifetime.

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 the required letter of commitment to back-up the submitted financial plan in the event of a shortfall of income?
- Is the institutional commitment to back-up the financial plan provided for a time period consistent with the expected effective lifetime of the requested instrument?
- Has the institution provided the required "Letter of Support" table listing previous S10 instruments awarded and installed within the past five years?
- Is the management of awarded S10 instruments sufficient?
- Does the Institution provide adequate infrastructure support for the requested instrument including space to house the instrument and site for sample preparation, if needed?

Shared Instrumentation Grant Program (S10) – Overall benefit – 3 pages

- Explain how the instrument will impact NIH-funded research and contribute to the institution's long-range biomedical research goals.

Hard to imagine needing 3 pages here . . .

Shared Instrumentation Grant Program (S10) – Letters of support

Letters from institutional officials;

- Institutional back-up for the proposed financial plan;
- Inventory of instruments unavailable to the PD/PI (per Justification of Need).
- Letters of support promising matching funds.

If human, animal, or infectious materials, which could create a potential biohazard, are to be analyzed, a signed letter from the institutional biosafety officer stating the proposed containment plan was reviewed and adheres to documented biosafety regulations. If relevant, this letter is required in the application.

Shared Instrumentation Grant Program (S10) – Letters of support

The institution must also provide a table that includes information about performance of all previous S10-awarded instruments within the past five years; that is, FY 2011 - 2016. The table should have the following columns:

1) S10 Grant Number;
2) Year of Award;
3) Installation Date of the Instrument;
4) PD/PI's name; Generic Name of Instrument;
5) Instrument Status: (*Active* , *Pending* , *Upgraded* , *Not Available*
6) Actual Usage Time (hours/year the instrument was used for research
7) Maintenance Agreement (*Active* , *In-House*, *None* , *Not Available*
8) *Number of Publications Citing the S10 Award.*

If the instrument is currently non-functional, the institution must provide a supplementary explanatory text.

Shared Instrumentation Grant Program (S10) –

- Biosketches: Include biosketches (in the standard NIH format) of Major Users, Minor Users, and technical personnel, as applicable. Biosketches don't count towards the page limitation.