

The Resource Allocation Program at the University of California, San Francisco: Getting More from Intramural Funding Bucks

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Abstract: *Intramural funding programs within both large and small research institutions are an essential mechanism to foster collaborative, novel, or preliminary research activity, and to further institutional research strategic goals. At most research institutions in the United States, these funding opportunities are managed by each funding agency or program, independently of each other. The lack of a shared administrative structure for these independent programs can lead to inefficiency and ineffectiveness of any one program. For example, a researcher must navigate several websites to determine which funding opportunities are available and then face multiple submission deadlines scattered across the entire academic year. The Resource Allocation Program (RAP), a shared*

administrative structure at the University of California, San Francisco (UCSF), has centralized the announcement, submission and review process for opportunities offered by multiple intramural funding sources. Results of the shared structure include increased efficiency due to consolidation of internal review committees, increased visibility of funding opportunities, increased transparency and consistency of the selection process, and enhanced availability of valuable review feedback.

Keywords: *intramural funding, seed funding, scientific review*

Introduction

Intramural funding programs within both large and small research institutions are an essential mechanism to foster collaborative, novel, and preliminary research activity, as well as further institutional research strategic goals. Seed or pilot funding has been critical to individual research efforts, enabling researchers to establish experimental feasibility and generate preliminary data for more mature grant submission efforts. As Balaji and colleagues noted in their study, receipt of internal awards of even \$20,000 can serve to jumpstart research projects and their subsequent higher-level funding (Balaji, Knisely, and Blazyk, 2007). Research institutions and their associated individual programs and departments can utilize such internal funding mechanisms to strategically support specific areas of research. The University of California, San Francisco (UCSF), like many large research institutions, has many internal funding programs sponsored by private foundations, large National Institutes of Health (NIH) funding-based centers, departments, and schools.

At most research institutions, intramural funding opportunities are run independently of each other. In 2007, UCSF developed an intramural funding opportunity management program that accommodates multiple funding agencies/programs and grant mechanisms, simultaneously offering much added value to the campus-wide intramural funding enterprise. Having determined that good models for efficient intramural funding opportunity management did not exist at similar institutions, the UCSF Clinical and Translational Science Institute (CTSI) proposed, through funding from its NIH CTSA grant (PI-Dr. Joseph McCune), to establish the Strategic Opportunities Support (SOS) Center that would support a seed grant funding program. The SOS Center developed an initial infrastructure for this seed funding program that allowed for efficient publicity, application and review of seed funding proposals. We soon realized this infrastructure could be utilized more broadly across the campus.

In an effort to support the most promising novel research ideas and young investigators, as well as the work of established investigators and internationally recognized faculty, the SOS Center further improved its initial infrastructure for the distribution of seed funds. The new, improved infrastructure, based in part on the NIH's Center for Scientific Review (CSR), was named the Resource Allocation Program (RAP) and was launched in the fall of 2007. In 2011, RAP was placed under the centralized management of the Executive Vice Chancellor and Provost's Office in order to realize the objective of supporting the entire campus and additional funding programs. The SOS Center continues its mission within CTSI and participates in the RAP consortium.

RAP is a campus-wide program responsible for coordinating intramural research funding opportunities. RAP serves as a consortium composed of numerous (currently 16; see Figure 1) UCSF funding agencies that may share overlapping goals while maintaining full autonomy over their funding mechanisms and awardees. (At UCSF, major funding programs are often referred to as “funding agencies”.) This cooperative venture between RAP and UCSF funding agencies awards nearly \$5 million per year to UCSF faculty and distributed 145 awards during FY 2012-2013. RAP is designed to harmonize the award process by providing a standardized, centralized, and transparent process for the submission, review, and tracking of intramural research funding. This single-application process allows for a more efficient and cost-effective approach.

Prior to the 2007 establishment of RAP, each UCSF funding agency ran independent competitions. A researcher had to navigate several websites to find out what funding opportunities were available and then face multiple deadlines, scattered across the entire academic year, in order to submit applications via primarily a “paper” or manual submission process. The review process was anything but uniform as each agency handled the review differently and reviewers were recruited on an as-needed basis. The reviewer pools utilized by each agency were fairly small and not able to offer broad skill sets. Conflicts of interest within each agency were a constant challenge during both the review and award process.

Program Description

RAP is a central institutional resource at UCSF, administered by the Executive Vice Chancellor and Provost’s Office and its component Research Development Office (RDO). Specific objectives of the program are to:

- publicize intramural funding opportunities of member agencies and coordinate high-quality review of proposals by experts appropriate to the proposal topic;
- coordinate funding of proposals among the funding agencies, maintain a database of prior proposals, and publicize successful applications on the Internet;
- provide a forum for inter-agency communication regarding any aspect of the application process; and
- carry out self-evaluation by developing metrics for success according to the RAP objectives.

RAP’s benefits are well explained in its slogan, “One Application, Many Funding Opportunities, One Deadline.” Llorens and Kellough (2007) described the increased efficiency and performance of a “one-stop” recruitment process in their discussion of centralizing personnel administrative services. For similar reasons, RAP was transitioned centrally on campus in order to increase the overall efficiency of intramural funding processes; to increase the visibility, accessibility and ease of use for researchers; and to minimize the administrative redundancies of the application process among funding agencies. RAP provides a common application process and a common deadline for a wide range of intramural grant mechanisms. Funding opportunities are open to all UCSF appointees in all UCSF schools and affiliated sites.

Since its inception in 2007, RAP has grown from managing three intramural funding programs to the current 16 programs, whose funds come from a variety of intramural and extramural sources. RAP’s founding members comprised the UCSF School of Medicine Research Evaluation and Allocation Committee, the UCSF Gladstone Institute of Virology & Immunology Center for AIDS Research, and the CTSI SOS Center. UCSF’s Academic Senate and the Helen Diller Family Comprehensive Cancer Center joined RAP at a later date. As additional funding agencies have joined RAP, the number of grant mechanisms has increased in number and diversity, as shown in Figure 1 below.

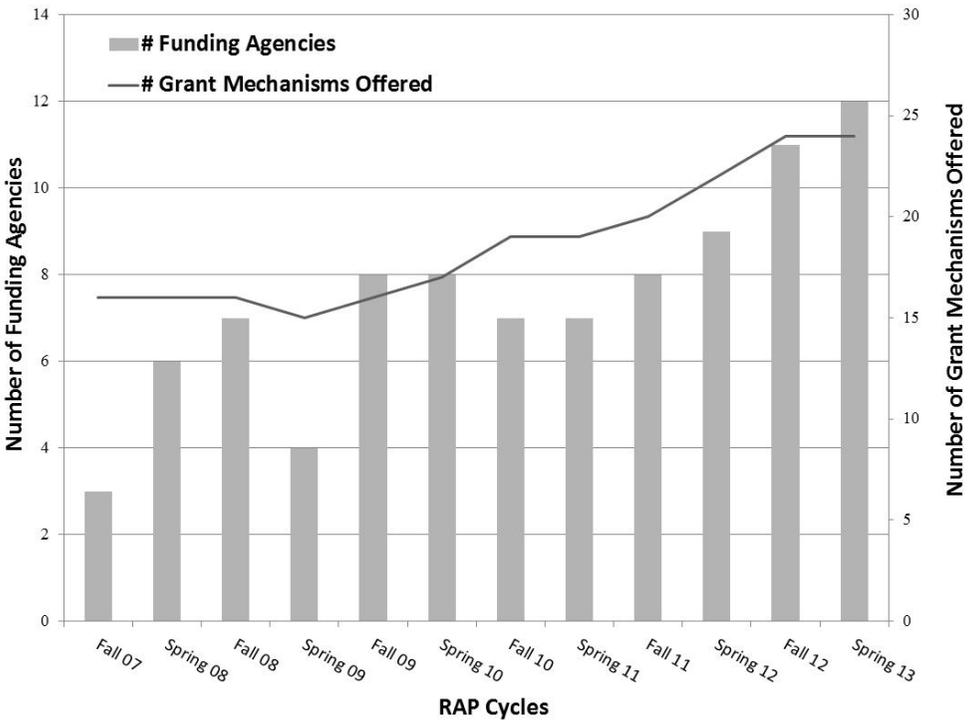


Figure 1. RAP Growth from Fall 2007 to Spring 2013. This figure includes only those agencies that use the full spectrum of RAP services: funding opportunity dissemination, submission and review management. Some intramural funding agencies choose to use only the dissemination and submission capabilities of RAP.

Organizational Structure and Governance

Bill Kirby, a long-time expert in research administration, described the need for programmatic commitment to quality, strong customer and stakeholder focus, and built-in continuous improvement processes in his Quality Management Model for successful research administration programs (Kirby, 1992). He went on to describe in a later paper the need to understand

research administration programs as “systems” or consortia of “interdependent components” or stakeholders (Kirby, 1996). The RAP founding leadership also recognized the value of group buy-in and stakeholder cooperation in order to establish a successful program structure. Thus, RAP has a multi-dimensional leadership structure that includes several entities, all playing a significant role in the program’s governance.

The operational RAP leadership team includes the chair and vice-chair of the RAP Executive Committee, the RAP Program Manager, and the Research Development Office Director. As shown in Figure 2, the multi-dimensional leadership team is guided by two committees: an Executive Committee and a larger RAP Committee.

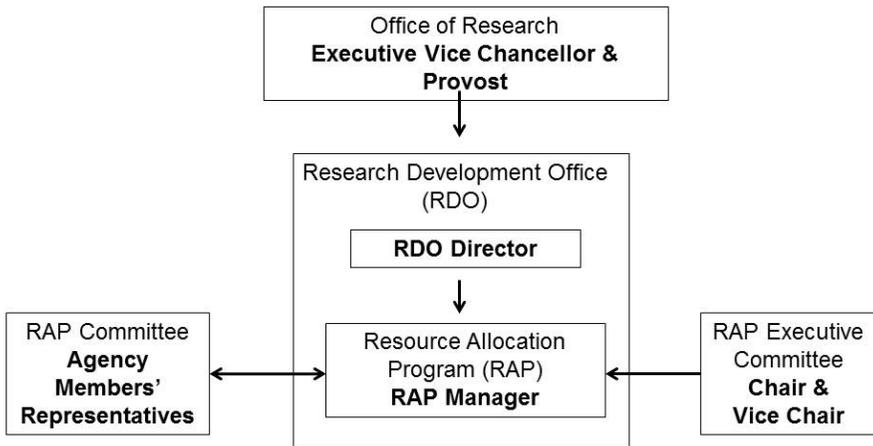


Figure 2. RAP Organizational Structure

The Executive Committee is composed of a chair, vice-chair, and program directors (all of whom are faculty members) whose programs have funded more than 10 percent of RAP awards in the previous two cycles. The Executive Committee provides guidance on program policy and operational issues, and meets on an as-needed basis. The committee’s chair and vice-chair are appointed by the UCSF Executive Vice Chancellor. The term of office for both is three years and is renewable.

The RAP Committee, an essential aspect of the consortium-nature of the program, is composed of faculty directors and staff of the participating funding programs. Each funding program appoints one faculty member to the committee, as well as one staff member, usually a program manager, to improve up and down communication and increase effectiveness. Although faculty opinion is essential, we recognize that in order to achieve successful implementation, it is also important to involve staff members at the early stage of any discussion. Just as a scientist brings valuable perspective on medical and scientific issues, administrators can weigh in on the feasibility of programmatic matters such as budgeting, project timelines, and resource availability.

The RAP Committee regularly holds a monthly teleconference that allows all members to participate in continuous program improvement. RAP leadership requires consulting with the entire committee on significant changes regarding policy or major program improvements. This committee convenes in-person twice a year to make final funding decisions at the end of each cycle, and annually for a programmatic retreat.

RAP Program Features

Leslie Wimsatt and colleagues presented the highlights from a faculty workload survey conducted by the Faculty Standing Committee of the Federal Demonstration Partnership in Washington, D.C. (Wimsatt, Trice, and Langley, 2009). This 2009 survey highlighted the heavy administrative burden that is placed on our research faculty, with upwards of one-third of their time spent on pre- and post-award activities. Add to this the fact that grant funding success rates at NIH, the largest funder of research grants in the US, has declined by nearly 30% since 1996, sitting at approximately 18% for R01 equivalent awards (Garrison & Drehman, 2013), and we have a highly competitive funding environment and a limited amount of time available for researchers to spend on administrative tasks. For these reasons, among others, RAP has sought to optimize the ease-of-use to research applicants and maximize the potential funding success rate for any submitted proposal through a multi-faceted approach described in further detail below.

Established Funding Cycles

Spring 2013 Cycle Timeline	
Date	Task
Mon January 7	Provide Website/RFA changes
Mon January 28	Request for Applications
Mon February 25	Application Deadline
Mon March 4	List of applications is sent to RAP Executive Committee
Fri March 8	RAP EC assigns applications to Review Committees
Thu March 14	Applications are distributed to the chairs/support staff
Thu March 21	Review Committee chairs assign applications to reviewers
April 29-May 7	Review Committee meetings take place
Mon May 13	Scores are compiled and distributed to funding agencies
May 17-May 24	Funding agencies decide funding priorities
May 28-June 5	“Horse-Trading” Session to make final funding decisions

RAP offers two funding cycles per year: spring and fall. A typical cycle timeline is shown in Table 1. Discrete, regular cycles are valuable to researchers and research administration staff who are involved with the process. Researchers are better able to plan their grant preparation responsibilities. In addition, this biennial cycle supports good planning and efficient time and resource management by administrators within both the RAP program and the funding agencies.

Table 1. Typical Cycle Timeline

Comprehensive Marketing Strategy

The launch of each cycle is supported by a multi-pronged marketing plan aimed at making the campus research community aware of available internal funding opportunities. RAP broadcasts the launch of each funding cycle broadly, highlighting changes such as the addition of new funding agencies or programs or the addition of new grant mechanisms. For each cycle, an email from campus research leadership on behalf of RAP is sent to faculty and researchers, a web article is published on the UCSF website, competition information is posted on the RAP website, and posters and flyers are distributed around campus. A sample poster publicizing the spring 2013 cycle is shown in Figure 3 below.

RAP Resource Allocation Program
A collaborative effort among UCSF funding agencies

Funding for Research at UCSF has Never Been Easier

RAP Spring 2013 Cycle
Application Deadline: Monday, February 25, 2013

REAC UCSF AS ACADEMIC SENATE ADRC UCSF Helen Diller Family Comprehensive Cancer Center NCOEWH OCIM-MZHF

**One Application
Many Funding Opportunities
One Deadline**

ARI UCSF RRP CTSI DERC NIDDK CFAR AHI

Grant Areas Include:

- Career Development
- International & HIV-AIDS
- Multidisciplinary
- Pilots
- Shared Instrument
- Technology

Learn more: <http://rap.ucsf.edu>

Figure 3. Sample Poster

RAP also supports a small number of “off-cycle” funding opportunities that are offered on an as-needed basis. In these cases, funding programs need to award their funds faster than the set deadlines of the main cycles would allow. Even in these cases, outside of the discrete cycles, the sponsoring programs are still able to leverage the RAP marketing strength as well as to utilize the same grant submission framework. The off-cycle grant opportunities, always offered as a single grant mechanism, are reviewed independently and do not use the RAP review committees.

Straight-forward, Easy-to-use Submission Process

RAP’s application, review, and award management process is shown in Figure 4 below. The Request for Applications generally goes out six weeks before the application deadline. The Request for Applications defines the application submission time window for the electronic submission system (the “start date” through the “end date”). On the start date, the electronic application form is active and the website is completely updated.

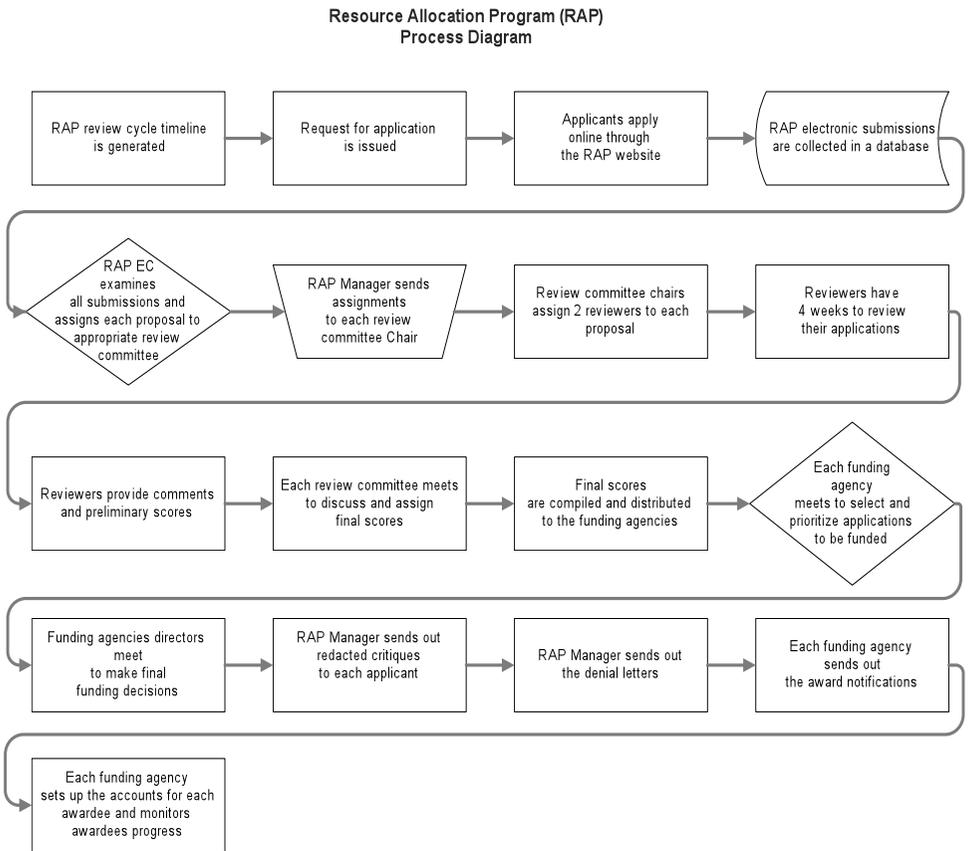


Table 4. RAP Process Diagram

Every cycle is dynamic; new grant mechanisms can be offered and existing ones can be modified. New funding agencies can join RAP and existing agencies can decide which grants they want to continue to offer. The RAP Program Manager contacts participating programs and agencies ahead of the RFA announcement and asks them to review the website content relating to the grants they sponsor. Once this full assessment of all changes is done, the entire website content is updated using software engineering resources. The Program Manager is ultimately responsible for the deployment of a new and updated version of the website and electronic application before each new cycle is launched. In this way, any agency changes, e.g., types of grants offered or changes in eligibility requirements, are appropriately communicated.

Effective Website

The RAP website (<http://rap.ucsf.edu>), designed as a user-friendly, one-stop-shop for different intramural funding opportunities, is a significant resource for all users.

UCSF University of California, San Francisco

Resource Allocation Program

A collaborative effort among UCSF funding agencies

RAP

HOME ABOUT GRANTS APPLY RESOURCES CONTACT US

**One Application
Many Funding Opportunities
One Deadline**

Two Cycles per Year
Fall Cycle: September Deadline
Spring Cycle: February/March Deadline

How RAP Works

- The applicants choose the grant mechanism that best fits their proposals
- The funding agencies choose to fund the best proposals based on programmatic criteria

Grant Mechanisms

- Career Development
- International & HIV-AIDS
- Multidisciplinary
- Pilots
- Technology

DETERMINE ELIGIBILITY & COMPARE GRANTS

Fall 2013 Cycle Deadlines

Call for Applications: August 12, 2013

Application Deadline: September 23, 2013 2:00 pm PST

Award Notifications: January 2014

Spring 2013 Cycle Deadlines

Award Notifications: Mid-June 2013

Feedback Notifications: End of June 2013

UCSF-PUMCH Project Grants Deadlines

Award Notifications: July-August 2013

Grant offerings, application rules, eligibility criteria, and other requirements are subject to change from cycle to cycle. Be sure to review the website after we launch the Call for Applications on August 12, 2013 to learn the updates and prepare your application accordingly.

UPDATES

Grants/Funding no Longer Offered

- CC-CFAR Pilot Awards in HIV-Associated Malignancies
- CTSI-Clinical Research Services (CRS) Early Career Investigators Pilot Award
- Extra Funds for Eye Research – The Academic Senate will no longer fund eye research proposals at \$50k (Ryan Endowment Fund no longer available)

Completion of the Spring 2013 Cycle
RAP reviewed 148 applications and made 72 awards for the Spring 2013 cycle; 49% of the grants reviewed were awarded. Thanks to the combined efforts of multiple funding agencies, a total of \$2,404,505 was distributed to UCSF researchers. For more details and to find out the names of the awardees go to 'Resources' on the RAP website.

Figure 5. Screenshot of RAP Website Home Page

The website is organized into the following sections: HOME, ABOUT, GRANTS, APPLY, RESOURCES, and CONTACT US.

The HOME page, shown in Figure 4, highlights the program's slogan, "One Application, Many Funding Opportunities, One Deadline," and explains how RAP works. The page has information on RAP's major grant areas and links to other pages with information on current opportunities, eligibility criteria, and award amounts. The HOME page also features updates on important policy changes, new offerings, and any news pertaining to RAP. There is a well-defined, color-coded section that highlights funding cycle deadlines.

The ABOUT page briefly describes the program, mission, leadership team, and participating funding agencies. It also describes the RAP review process, and lists the standing review committees as well as all reviewers, without denoting their affiliation with a particular review committee. The GRANTS tab shows an overview of all grants offered, organized by major categories (Career Development, International, Multidisciplinary, Pilots, Technology). From this page, applicants can select each grant mechanism and find further specific information. The APPLY tab leads applicants to a step-by-step guide on how to submit a RAP application and includes an electronic submission form.

The RESOURCES page provides information on past awardees, program statistics, descriptions of success stories, sample proposals, and letters of support. Finally, the CONTACT US page provides contact information for the RAP Program Manager and the administrators of each participating funding agency.

One Simple Application Form

Applicants submit proposals to RAP via an on-line application form that is the same for all grant mechanisms offered. The application is designed to capture all information needed for the review and award process as well as for future reporting. The current application form has evolved over the years with the feedback and general consensus from all the funders. The program tries to balance the need to capture as much information as possible with the benefit of keeping the application within a reasonable length. Changes to the application form are driven by the common utility among the funders. If a new piece of information is useful to the majority of funders and applicable to most grants offered, then the implementation is deemed valuable.

Once all the required fields of the application form are completed, the applicant uploads the proposal as a single file in a PDF format. The proposals are written following mechanism-specific instructions, which are developed by the funders but harmonized to look similar and display the requirements in the same order so it is easy for the reviewers to identify missing or incomplete components. Any mechanism-specific proposal content is within the uploaded PDF file. After submission, applicants receive an email confirmation and have the opportunity to revise their proposals up until the submission deadline. RAP applications are submitted directly by the investigators who generally utilize their finance units or pre-award analysts to prepare the relatively simple budget. "Full-service," formal institutional grant administrative support is not needed.

Past the deadline, the electronic application is disabled and the review process begins. All electronic submissions are stored in a database and later downloaded by the Program Manager and placed in a common data repository to be available for review. The database allows two levels of administrative access: a basic administrative level granted to all support staff, and a higher administrative level granted only to the Program Manager that allows deleting and adding applications on an as-needed basis.

Comprehensive Expert Review

The RAP review process has been modeled after the NIH CSR study section review process (NIH, 2012), which is used to review NIH grant applications for their scientific merit, providing unbiased, expert assessments. The RAP review process uses 10 specialized standing review committees and draws from a large campus-wide pool of internal faculty, matching reviewer expertise with each proposal to provide a fair, peer-reviewed process that will encourage and stimulate research. This approach is possible at UCSF because it is a large institution with a broad spectrum of scientific areas represented. In a different setting the process might require the recruitment of external reviewers. It has been challenging to balance the benefits of utilizing senior faculty, who are more experienced, with junior faculty, who are more available and willing to serve. We try to achieve a good mix of senior and junior faculty. This balance also provides the perfect setting for mentoring opportunities. The review committee chairs are always senior faculty and expert reviewers. Finally, it is our goal during the reviewer recruitment process to have a good representation from all the schools: Medicine, Pharmacy, Dentistry, and Nursing.

Most applications submitted through RAP are assigned to a review committee organized by subject area. Currently, RAP manages 10 review committees. These committees are standing committees, each led by a chair and composed of UCSF faculty members. Each review committee reassesses subject areas, chairs, and membership on a yearly basis. Faculty members are nominated based on suggestions from the funding agencies, the chairs, and members of review committees. Nominees are also drawn from past awardees and other faculty who have volunteered for these committees.

Proposals are reviewed by at least two individuals with expertise in a closely related field and discussed by the entire topical review committee. Proposals are scored according to the review criteria delineated by the funding programs in the descriptions of each grant mechanism. Critiques are returned to the proposal Principal Investigator as feedback. Funding agencies choose to fund proposals based on the review comments, scores, and respective alignment with their programmatic goals.

The RAP review committees were formed according to the needs defined by the funding mechanisms offered through RAP and may be modified over time based on the proposals submitted. The program's goal is to establish a large pool of experts in various research areas and have all committee members be potential reviewers. However, depending on the number of proposals received and the reviewers' areas of expertise and availability, each reviewer will not necessarily review every cycle. Before RAP, each program could only use faculty reviewers who

were part of specific networks. The pools were small and often the match between application and reviewer expertise was far from ideal.

The RAP review process is perceived as fair by faculty leadership, reviewers, and applicants. Great attention goes to avoid conflict of interest during the review process, and chairs make a sincere effort to match each application with the appropriate expert reviewers. There is a strong commitment to provide a good review as each reviewer could be an applicant in the next cycle, and therefore everyone desires a fair process.

RAP Proposal Review Process

Review Committees

The RAP Executive Committee receives the full list of applications and can access all proposals via Dropbox®. The Program Manager makes the first attempt at assigning applications to the appropriate review committee. All resubmissions are reassigned to the same committee and to the same reviewers who did the review previously. The Executive Committee confirms assignment of each application to the appropriate review committee by topic. During the online submission, applicants can select the review committee, but the final decision regarding committee assignments is ultimately up to the Executive Committee and later confirmed by review committee chairs. Applicants are also given the opportunity to indicate one potential faculty member who should not review their proposal; chairs do their best to accommodate their request.

The chair of a RAP review committee plays a key role in the functioning and success of the review process. The chair and administrative support staff are responsible for managing the review process in compliance with RAP policy. The chair and support staff work in partnership to help facilitate a review process of the highest quality and fairness.

Review committee chairs receive and review the applications assigned to their committees and either agree with the assignments or suggest alternative review committees better suited in expertise. The review committee chair assigns two reviewers to each proposal, each equal in responsibility. The chair tries to avoid even the appearance of a conflict of interest and takes into consideration both the proposal PI(s) and the co-investigators. For RAP, being in the same department does not necessarily constitute conflict of interest. Faculty members with the same skill set most likely work in the same unit and are the experts needed for a good review. The general guideline for conflict of interest is that reviewers are in conflict if their research will benefit directly if the proposal is awarded, if they are in direct competition with the applicant in the research arena, or if they have a personal relationship with the applicant that may lead to bias. The larger the size of a review committee, the easier it is to manage the conflicts.

Once the reviewers' assignments are complete, support staff members contact each reviewer and provide materials necessary to complete the review of the grants assigned. This includes:

- a full list of all proposals assigned to that committee;

- customized review forms saved with a specific naming convention that makes it easy to retrieve reviews later. The review forms display the 1-9 scoring system used by RAP and scoring rubrics. Additionally, the forms have embedded any grant mechanism-specific questions that the reviewers need to address in order to provide a comprehensive review in alignment with research standards and funders' goals;
- a request to reply immediately if there is a conflict of interest so the proposal can be reassigned; and
- standard operating procedures (SOPs) developed to orient and guide chairs, reviewers, and support staff on the review process and on how to conduct the review committee meetings. The RAP review process SOPs are in alignment with the NIH review criteria and describe in great detail pre-meeting, meeting and post-meeting responsibilities to ensure consistency across the review committees.

Reviewers can access all applications assigned to their committee and previous reviews for the re-submissions. Reviewers are given approximately four weeks to review their set of proposals and assign preliminary overall scores based on the NIH scoring system. RAP does not ask reviewers to assign a score to specific review sub-categories as is done by the NIH CSR study sections.

Review Committee Meetings

Prior to the review committee sessions, the chair and support staff discuss plans and materials needed for the review session. The chair reads the reviews in advance of the meeting to facilitate the discussion, especially for those applications with a wide divergence in preliminary scores. An effort is made to have as many participants as possible attend in person with the option of teleconferencing offered as needed. The chair is responsible for ensuring each review is fair, equitable, and free of bias.

All proposals receiving a score of 5 or greater from both reviewers are triaged and not discussed, unless there are members of the review committee who would prefer to discuss them. The assigned reviewers provide their initial level of enthusiasm and concise reviews of the application with emphasis on its impact, strengths, and weaknesses. The proposal is then discussed by all committee members. Each proposal is given a final score by all non-conflicted reviewers in attendance (in person or by phone), including the chair. (These scores will be averaged to generate a single final score.) At the end of the meeting, scoring sheets are collected, and issues are either clarified or noted.

Post-Review Session Responsibilities

After the meeting, final scores are tabulated and results sent to the Program Manager. Reviewers' attendance and workload are tracked for all committees every cycle. Reviews for all the proposals in the competition are collected and reviewers' names and initial scores are redacted.

The Program Manager distributes the final results in a spreadsheet to the RAP committee (funding agencies). The sheet includes all applicants' names and proposals titles, the average

and standard deviation of the review committee final scores, and special notes. The sheet is organized by scores (from best to worse) and by grant category. The spreadsheet also contains charts with the distribution of scores among each committee and overall. Redacted reviews are made available to the funding agencies to facilitate their funding decision process.

Funding Agency Meetings

Using this list of candidate proposals and the associated final scores, each funding program plans its own internal meeting to decide funding priorities. During this meeting the funder discusses which proposals they would like to see funded, regardless of their ability to fund, and which proposals they would specifically prefer to fund. Funding agencies take reviews and scores into consideration along with how well a proposal fits their mission when deciding which proposals to fund.

The Cooperative “Horse-Trading” Session – Final Funding Decisions

One of the novel and valuable steps in the RAP process is the final funding session. All faculty directors and managers of the participating funding agencies, along with RAP staff, convene in person to make final funding decisions. The RAP Executive Committee chair moderates the session, calling every proposal in ascending order of score (best to worst) and asking who, among the funders, is interested in funding that application. The process is often referred to as “horse-trading” since it frequently involves trading one proposal for another to ensure all agencies meet their funding goals.

Our experience has shown that this meeting is remarkably successful in accommodating everyone’s needs and allowing for a higher number of proposals to be funded. All funders come into the meeting with the goal of allocating their funds strategically and supporting as much good science as possible. This step in the RAP process significantly improves the likelihood of funding a strong proposal. Proposals submitted to one program may be picked up for funding by another funding agency because the topic of the proposal is relevant to that agency as well. Sometime proposals are co-funded by two different funding agencies.

After the meeting the results are circulated one additional time and agencies have a chance to review the funding decisions and make any necessary adjustments. If there are no issues, funding decisions become final and the funding agencies can start notifying their awardees while the RAP Program Manager sends out declination letters.

Applicant Feedback

At the end of each cycle, all applicants are notified of the outcomes and receive written reviews. The reviews are redacted so as not to reveal scores, reviewers’ names or confidential comments. As has been observed before (Balaji et al., 2007), regardless of the funding outcome, this feedback is extremely valuable to applicants, especially for either their resubmissions to intramural funding opportunities or for subsequent extramural grant development. At the final step, the names of the awardees are posted on the RAP website along with the funding statistics for the cycle.

Costing Models

All programs on campus are eligible and welcome to use RAP to coordinate their funding opportunities via one of the two costing models:

Model 1: A full-service option that includes dissemination, submission, and review of proposals. Each program is charged based on the percentage of dollar amount funded in the prior academic year, i.e., their share of total cost is in direct proportion to the amount they awarded.

Model 2: A partial service option, where a funding agency uses RAP to publicize funding opportunities and administer on-line submissions. Costs are assessed on the basis of proposal submissions, i.e., there is a fixed charge per proposal submitted.

RAP has also served some programs by only advertising their funding opportunities at no cost.

A quick glance at the RAP budget will show that it is fairly lean and simple. It is composed of personnel expenses covering the Program Manager's salary and, in small percentages, the salaries of the other leadership members (RDO Director, RAP Chair and Vice-Chair). The budget also includes items such as honoraria for review committee chairs, computer support, marketing materials, and supplies.

The funding agencies that have used RAP recognize the added value and appreciate the services provided. Institutional leadership (Executive Vice Chancellor and deans of the four schools) has also recognized the value and benefits to the campus community and, in fact, partially subsidizes the program. The RAP model requires central support to succeed so that the costs are shared between the funding programs and the institution. Although RAP provides a huge value-add compared to what each single program alone could do, it can be too much of a financial burden, especially for the smaller programs, to pay for premium grant competition management services relative to other competing needs within their specific programs.

Implementation Challenges

Although the program founders had a clear vision and strongly believed that RAP would improve the management of intramural funds on campus, like in many process changes, there were some concerns. The funding programs and agencies were concerned that joining RAP would diminish their unique identity and perhaps even create confusion about their specific programmatic goals. The concern over programmatic identity was soon overcome by a simple marketing strategy. Agencies were represented on the RAP website and announcement materials with their names and logos, such that applicants easily identified the funding programs. The website continues to highlight the supporting funding program(s) for each grant mechanism offered. Some grant mechanisms are only supported by one funding program; others, e.g., the *Pilot for Junior Investigators*, are supported by several programs depending on the proposed project topic area and funder strategic goals. The Research Evaluation and Allocation Committee grants, for example, only supports researchers affiliated with the School of Medicine and the Helen Diller Family Comprehensive Cancer Center requires

faculty applicants to be Cancer Center affiliates, while programs such as the Academic Senate have a broader funding target and fewer restrictions.

Another concern expressed by the early RAP adopters was that they might not maintain full autonomy over their funding mechanisms and awardee selection. This concern disappeared when programs realized they had full control over their research funding announcement content and grant descriptions. They were (and are) still able to determine independently key components of the grant mechanism, eligibility, review criteria, and award amount. They also provide grant-specific instructions that capture additional relevant applicant information. Occasionally RAP encourages funders to follow similar parameters when providing grant descriptions and instructions if that can benefit the applicants and the overall application process. In those cases, the applicant ease-of-use and positive agency outcome has significantly outweighed any small loss of funder-relevant application information. RAP has encouraged all the participating agencies/programs to focus on the big picture and think beyond the confines of their own programmatic goals to explore together what can be done for the sake of supporting good science and collectively helping out the investigators at our institution.

Administratively, it can be challenging to change “the old way of doing things.” It is hard to change well-established methods and replace them with new practices. To that point, good communication between faculty directors and administrators has been a crucial and positive step forward itself. Successful process change requires an understanding of the change rationale, and the conviction that trying something new is worth it. During the initial implementation phase of RAP, we were fortunate that several funding program staff members involved were new, making things easier as no one was too strongly attached to old procedures. Inspired by the desire to implement innovation, the new and old funding program staff embraced the change to a centralized management structure. In addition, RAP maintains a strong “consortium nature,” with scheduled collaborative discussion that includes participants at all levels of the process (see discussion below).

Finally, coordinating staff members who support the review committees but do not directly report to the RAP Program Manager or to the RAP central leadership requires tact and consideration. Central guidance is indisputably needed to keep the process consistent, but to make things work, it is important to establish a positive model of partnership and “managing without authority.” Staff members involved need to buy-in and share the RAP programmatic goals, recognizing the value of each single contribution. Open communication is crucial so that all parties involved feel comfortable expressing their opinions, whether they be reservations or approvals. RAP management has worked hard through the organizational operations to empower each individual agency to speak its mind while encouraging everyone to keep an eye on each other’s needs as well. By fostering respectful communication, RAP management strengthens the shared belief that a strong working relationship among the RAP participants is necessary to achieve institutional intramural funding goals.

Results

This model for managing multiple intramural funding mechanisms has been very successful, owing in large part to the founders' clear vision regarding the program's purpose and goals. The program is infused with a sense of shared responsibility and accountability to the greater good of research at UCSF. Stakeholders still maintain a strong sense of ownership and commitment, and are proud of this fruitful collaboration uniquely characterized by strong involvement of funders, faculty, administrative staff, and central campus leadership.

All stakeholders benefit from a more formalized, standardized application process. RAP provides an ideal infrastructure for sharing best practices, enables staff networking, and realizes administrative efficiencies and economies of scale. RAP is able to reduce overlapping administrative functions and, at the same time, provide additional administrative functionality. Importantly, RAP maintains funding agencies' identities, and provides increased visibility of smaller funding programs.

A significant benefit of the RAP process is that researchers have an increased likelihood of receiving research funding (compared to extramural funding), while the funding agencies often see increased funding of proposals of their strategic interest. This synergy is attained through the horse-trading session where innovative proposals submitted to one agency mechanism can be co-funded or funded wholly by another agency. In this way, RAP enables the funding of strong proposals within an agency's interest but beyond their usual budget limits, and it enables an increase in the necessary seed support for campus research programs.

Not only are intramural funding programs like RAP inherently valuable for enabling the generation of preliminary data needed for subsequent grant proposals, but they also enable the opportunity for applicant mentoring and proposal quality improvement (Balaji et al., 2007). RAP is no exception in this regard because it fosters mentoring within the review committee setting and enables proposal quality improvements via quality written feedback from the expert review process. Additionally, channels are created for networking of applicants with past awardees and review committee members.

Because the RAP review committees draw reviewers from the entire campus and hold single review committee meetings, they consistently offer broader scientific coverage, save reviewers' time and reduce their workload, and lower the potential for conflict of interest. This process also creates opportunities for mentorship of junior faculty reviewers. The expert review committee structure additionally enhances selection transparency and agency accountability for their funding decisions.

The RAP process provides tracking of all submissions, enables generation of statistical data on submissions, and stimulates agencies to revisit their goals/rules. RAP is working toward helping agencies in the evaluation and administration of awardees, e.g., tracking outcomes to evaluate the return on investment, facilitating progress reporting, and monitoring expenditure of funds.

Logistically, RAP offers other benefits to both researchers and stakeholders, including the fact that grant opportunities are easy to find as they are all in one web location, one application form fits all grant mechanisms, and there are two recurring cycles per year with a single deadline per cycle.

The program has grown steadily in support of different funding agencies since its launch in 2007. In FY2012-2013, RAP facilitated the award of \$4.6 million to a broad spectrum of UCSF researchers. All four schools (Schools of Medicine, Pharmacy, Nursing and Dentistry) and the Graduate Division are routinely represented among the awardees, and a full range of biomedical research is supported through RAP funding. Due to its effectiveness and strong marketing strategies, RAP is now one of the most highly recognized programs on campus. Moreover, another program at UCSF was modeled after RAP, the Resource Allocation Program for Trainees (RAPtr), which was created to facilitate funding opportunities for students and trainees involved in research or innovation projects.

Figure 6 shows the growth in overall grant submissions regardless of the type of review (All Submissions) and grant submissions that utilized all aspects of the RAP submission and review process (RAP-reviewed Submissions). Of those grants that did go through the full RAP review process, the graph indicates the number of grants awarded per cycle and the total dollar amount awarded for that cycle.

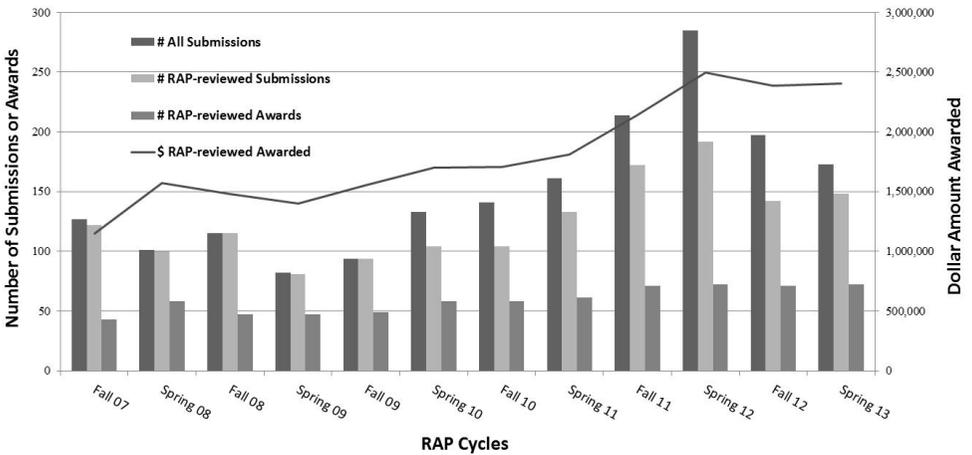


Figure 6. RAP Process Diagram

The centralized dissemination of funding opportunities not only connects researchers to potential funding in an organized, consistent, and simple way, but also provides university-wide visibility to the participating funding agencies. From the funding program perspective, this is certainly one of the biggest strengths of RAP. Table 2 shows the impact of RAP process management for one of the funding programs - the UCSF Gladstone Institute of Virology & Immunology Center for AIDS Research (CFAR). The number of applications received for

Year	Pre-RAP Management		Post-RAP Management			
	2006	2007	2008	2009	2010	2011
Number of Applications	16	14	25	37	47	46

Table 2. CFAR Grant Application Number before and after RAP Implementation

funding consideration nearly doubled after implementing RAP and its associated “marketing strategies.” Anecdotally, this program also saw awards become more broadly distributed across the four schools on campus post-RAP implementation (data not shown).

RAP has also provided a structure through which funding agency programmatic data can be captured; prior to RAP most programs did not have the resources to track program performance metrics. Through RAP, funders now have access to more comprehensive statistics and have developed an awareness of the importance of accurate metrics. We continue to seek improvements in performance assessment.

**UCSF Clinical and Translational Research Institute
Strategic Opportunities Support (SOS)
Return on Investment by Fund Year**

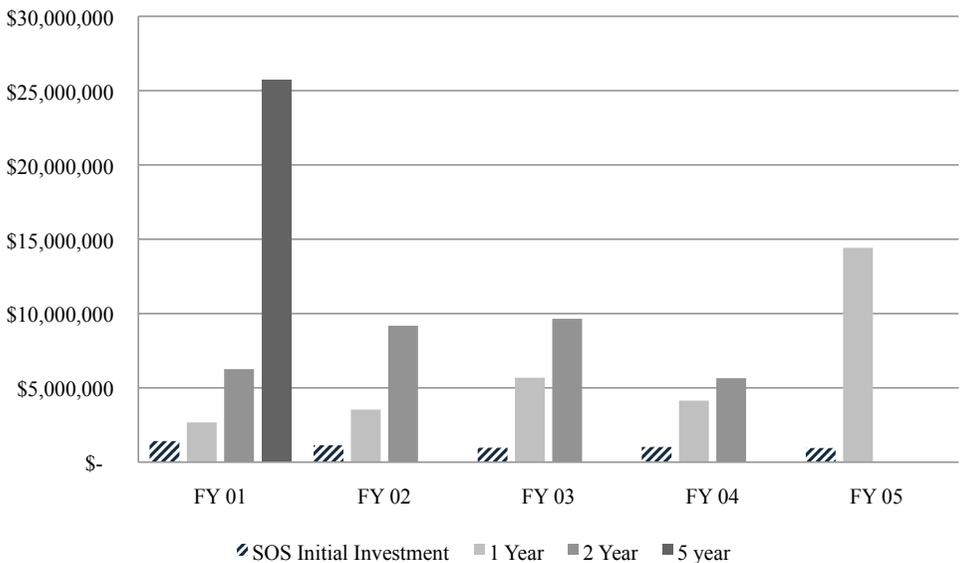


Figure 7. Return on Investment from the CTSI-SOS Program, one of the RAP funding agencies. The consistent and significant return on initial pilot funding program investment is largely due to the award of larger extramurally-funded grants.

RAP has facilitated the success of many on-campus funding programs such as CFAR and the CTSI-SOS Center. While it is hard to conclude what would have happened had an agency like CTSI-SOS not used RAP, it is evident that the investigators selected through the RAP process were successful at leveraging the results of pilot funding for successful bids to obtain larger extramural grant funding. Figure 7 shows the return on financial investment for the CTSI-SOS program, which has been able to parlay awards from RAP-funded grants into larger research awards worth six- to sixteen times more. Similarly, CFAR has reported that with an investment of \$3,032,038 between 2007 and 2011, they have seen an increase in the numbers of K, R, P and U federal awards involving HIV/AIDS and totaling more than \$135 million (see Figure 8).

	CFAR Pilot Awards	K Awards	R Awards	P Awards	U Awards	Total Awarded
Eradication/Latency	120,000	835,155	1,731,403	5,639,865	5,142,040	13,468,463
Biomedical Prevention	15,000	243,308	5,300,711	0	7,724,303	13,283,322
HIV and Women	465,000	1,161,036	6,370,934	2,858,691	16,274,838	27,130,499
HIV and Cancer	827,353	0	4,825,334	533,743	7,703,786	13,890,216
HIV and Aging	190,000	2,454,242	16,178,815	0	3,735,540	22,558,597
International	1,414,685	4,629,347	20,335,858	7,485,516	11,034,188	44,899,594
Sub-Total	\$3,032,038	\$9,323,088	\$54,743,055	\$16,517,815	\$51,614,695	\$135,230,691

Figure 8. Productivity from UCSF – Gladstone Institute of Virology & Immunology Center for AIDS Research (CFAR) Pilot Grants

The success of these programs can also be measured in the number of scholarly publications that have resulted from proposals funded through RAP. CFAR, for example, reports that between 2007 and 2011, 87 of these award recipients and mentees have contributed to 469 peer-reviewed publications related to their studies (Figure 8). Prior to RAP, the UCSF funding programs did not track much information, but have now matured through RAP-fostered discussions and have an understanding of the importance of implementing systems that allow for tracking and reporting. This illustrates another benefit of centralizing the management of intramural funding: all participants gain insight leading to improvements in operations not directly related to fund competition management itself.

Conclusion

The RAP intramural funding process offers a variety of benefits to both researchers and stakeholders. The existence of a centralized, coordinated program allows researchers to easily find funding opportunities and plan their grant-writing responsibilities, since the two cycle deadlines per year are recurring and predefined. The RAP grant format itself is also simple and consistent across multiple mechanisms. This ease-of-use helps investigators access

research funding at critical junctures in their research career, and is especially important because the funding rate for applications is usually close to 50%, much higher than most other funding opportunities.

Researchers can also benefit from the networking channels created through the program with past awardees as well as among review committee members. The RAP review process offers an ideal setting for mentoring of junior faculty reviewers by more experienced colleagues. The quality of the reviews produced through RAP is optimized because of the substantial effort done by the review committees to match each application with the most qualified expert in the field across campus. The feedback provided to applicants helps with both RAP resubmissions and grants submitted to other internal or external mechanisms.

Applicants are not the only beneficiaries of the system, however. The consortium nature of the RAP process enhances transparency and accountability of all parties involved, challenging all to operate at their best, to have an open view on issues, and to rethink and continuously improve their processes. Stakeholders, such as the funding agency staff and faculty volunteers, also gain from RAP and they recognize the added value: RAP provides a more formalized and standardized process that leads to more consistent reviews and funding decisions. All participating agencies are now able to track all submissions (funded/non-funded) and can generate statistical data for reporting purposes. This consortium process constantly stimulates agencies to revisit and improve their goals and rules, and provides an excellent infrastructure in which they can share best practices and find opportunities for networking among themselves.

The next big step in the RAP program development is implementing a robust electronic solution that will not only enable efficient submission, review, award and tracking of proposals, but robust management and reporting as well. We are now ready to streamline the review process and decrease the administrative burden through a cost-effective electronic system. The award process, handled by each agency, can also be improved. If all data, from submission to award, is kept in the same system, RAP will be able to facilitate the development of reporting best practices for all participating funders. Identifying and developing such a tool and implementing it successfully are our next big challenge.

One of the program's biggest strengths has been the stakeholders' clear vision and cooperative behavior. It is our hope that RAP will be seen as a model and will inspire other institutions, big and small, to consider implementing a centralized intramural funding management program. Although the RAP process cannot be described as simple--it is actually more complex than the singular processes used in the past by the separate agencies--participants agree there is essentially no redundancy of work and every single effort is driven by a strong purpose. The deans and the Executive Vice Chancellor have recognized the value-add of a centralized management mechanism and are fully supportive of the program, recognizing that it strives to guarantee transparency, fairness and efficiency while maximizing the investigator potential for funding. Together, the RAP staff and associated consortium of funders and faculty do more and try to do it better -- truly a great example of on-campus synergy and teamwork.

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