

Biology
Research Experiences for Undergraduates (REU)
Programs

REU Site Directors Pandemic Check-In

Jan. 15, 2020

Bio REU Leadership Committee

2020

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Executive Summary

We convened the Biology REU Leadership Council to discuss the challenges of operating REU programs next summer given the pandemic. The pandemic puts significant constraints on the ability of Site Directors to operate programs; they must deal with institutional limits beyond their control (e.g., host institutions that may not allow summer programs, the inability to use campus housing, and limits on events sizes) and face challenging and novel situations on a limited budget. In some instances, those barriers can be addressed. In other instances, they preclude the ability to a Site Director from offering a program. Based upon discussions of the REU LC and conversations with the larger community, we make the following recommendations, which are fleshed out in greater detail in the body of the report.

1. **Allow for a second no-cost extension if the program must be cancelled or curtailed two years in a row.**
2. **Allow programs to accept students who are local, including from within the institution, for participation in the REU.**
3. **Support students who were accepted into programs that were cancelled in 2020.**
4. **Allow us to accept previously accepted students without a new admissions process.**
5. **To facilitate our ability to involve students who were accepted in 2020, whose programs were cancelled, and who have already graduated: develop a mechanism for accepting and funding such students in 2021.**
6. **Allow flexibility and provide guidance on the extent of the flexibility permitted in our proposed budgets.**
7. **Allow flexibility on program size and goals**
8. **Develop background/context for reviewers concerning program activities in 2020 and 2021.**

The report also includes additional information that may be useful for PIs in deciding whether to run their programs and/or plan for summer 2021 REUs.

Pulse Check Survey – In November of 2020, the site director community was surveyed to learn more about modifications, obstacles and lessons-learned from the decision-making process for running virtual programs in summer 2020. Please find survey questions in **Appendix 1** and responses in **Appendix 2**.

FAQs – Many questions have been asked during the Pulse Check Survey initiated on 11/4/20, the PI meeting on Nov. 24th and Dec. 3, and follow-up questions received by NSF and the Leadership Council. Please find responses to these questions in **Appendix 3**.

If you have any questions not covered in this report, please post them on the REU Slack Channel.

2020 Pandemic Check-In

Goals

Given ongoing effects of the Covid-19 pandemic on REU site activities, the Leadership Council (LC) for the Biology REU program (BIO-REU) decided to communicate with the larger REU Site Director community. Only approximately 25% of programs operated in 2020.

Furthermore, lingering uncertainty over the direction of the pandemic means that some programs may not operate in 2021, raising concerns about the loss of an REU opportunity for a cohort of undergraduate students. The LC decided it would be important to host a forum with the larger community to identify and potentially address barriers to programs operating in 2021, as well as to communicate lessons learned from programs that operated in 2020.

Activities

To address these issues, the LC conducted the following activities this fall:

1. Met over Zoom to strategize on Oct. 22, Oct 28, and Nov 18
2. Conducted a survey of the site director community in mid-November.
3. Hosted a Zoom meeting of site directors on Nov. 24
4. Hosted a Zoom make-up meeting on Dec. 3 for site directors who could not participate on the Nov. 24 meeting or who had follow-up questions.
5. Moved communications with site directors from a listserv to a Slack channel.
6. Posted resources concerning last and next summer on the bioreu.org website.

Agenda for Site Director Meeting of Nov. 24 (times PDT)

8:30 am	Identify Objectives of Serving More Students Next Summer, Meeting Agenda and Details of How Questions Answered (Ian)
8:35	Introduction of LC
8:45	NSF Overview (Sally O'Connor, REU program officer)
9:05	Summary of Survey Results (Liz Silva)
9:20	Question and Answer Session
9:40	What we learned from last summer (Joseph Ayoob, Fern Tsien, Alan Berkowitz)
9:55	Closing Remarks/Next Steps

Recommendations

- 1. Allow for a second no-cost extension if the program must be cancelled or curtailed two years in a row.**

Institutional restrictions on travel, student researchers, and mentor availability, and limitations in creating remote experiences, may necessitate a second year of cancellations. Site directors would like reassurance that they will be able to request a second no-cost extension if they must cancel two years in a row.
- 2. Allow programs to accept students who are local, including from within the institution, for participation in the REU.**

Travel and housing restrictions could be overcome by accepting students who are local to the program and have already arranged housing. Providing flexibility to Site Directors around expectations concerning serving students from within their institution will in some instances have a significant impact on the ability of programs to operate.
- 3. Support students who were accepted into programs that were cancelled in 2020.**

Encourage mechanisms to support students in 2021 who lost opportunities in 2020, including mechanisms for communicating opportunities to students.
- 4. Allow us to accept previously accepted students without a new admissions process.**

To reduce workload and to support students who were accepted into programs in 2020 that were cancelled, site directors should have broad discretion for how to handle admissions of such students in 2021.
- 5. To facilitate our ability to involve students who were accepted in 2020, whose programs were cancelled, and who have already graduated: develop a mechanism for accepting and funding such students in 2021.**

NSF REU funds are congressionally restricted to current undergraduate students. When the 2020 programs were canceled, many students who had been accepted were rising seniors. An alternative funding mechanism for supporting post-bac students could be important to retaining them in the scientific pipeline.
- 6. Allow flexibility and provide guidance on the extent of the flexibility permitted in our proposed budgets.**

Some programs that will run online only may have reduced costs for "in-person" expenses (such as housing and transportation). Simultaneously, other expenses may accrue such as access to stable internet, a computer, and specialized software. Clear guidance on which of those additional expenses can be categorized as participant support costs as well as how expenses could be shifted to other categories would be helpful.
- 7. Allow flexibility on program size and goals**

With limitations on the ability to recruit mentors (whether PIs or NSF fellows), a given program may lack sufficient research projects to support a typical cohort of students. Having flexibility to reduce cohort size and carry unexpended funds forward (e.g., for more students in a future year or through a no-cost extension) would increase the number of students served in 2021. Additionally, while in-person experiences may be prohibitive and mentors may be more scarce, it might be possible in some cases to shift to a remote format, to computational rather than field- or lab-based projects, to group projects

(multiple students with one mentor); to computational skills-focused training or more technically based projects; or to field-based projects that are conducted individually and remotely (e.g., in local yards or parks). Flexibility to consider such creative options may increase our ability to serve more students.

8. **Develop background/context for reviewers concerning program activities in 2020 and 2021.**

Given the difficulty in operating in 2020 and 2021, and how programs that have operated have had to make substantial changes (e.g., moving to online, computational, or group projects), there is concern about how renewal proposals will be evaluated. General guidance to the site director community about how to frame changes in activities, goals, and achievements and to reviewers about how to evaluate such changes would help to alleviate some of this anxiety.

The Leadership Committee

The Bio REU Leadership Committee (LC) was established following the 2007 Bio REU PI workshop. Its mission is to promote an active and diverse undergraduate Biology research program. The LC plans and hosts the Bio REU PI workshops, develops and maintains a website for REU Site directors (www.Bioreu.org), develops and maintains a Slack channel for communication, and provides feedback to NSF concerning the program.

Leadership Committee members for the 2020 Zoom Teleconference:

Ian Billick (Chair)	Rocky Mountain Biological Laboratory
Joseph Ayob	Univ. of Pittsburgh
Janet Branchaw	University of Wisconsin - Madison
Britt Carlson	Parkland College
Camellia Okpodu	Xavier University of Louisiana
Robert Podolsky	College of Charleston
Juan Ramirez-Lugo	Universidad de Puerto Rico-Rio Piedras
Elizabeth Silva	Univ of CA San Francisco
Michelle Evans White	University of Arkansas
Alan Wilson	Auburn University

Bio REU PI Workshop History

The 2019 workshop was the seventh workshop held for Bio REU PIs. Below we summarize previous workshops and the focus/outcomes/notes of those meetings.

YEAR	FOCUS/OUTCOMES/NOTES
2003	Included UMEB PI's
2007	Established Leadership Council
2010	America COMPETES
2012	Assessment, RCR, sustaining programs
2014	Evidence-based practices
2017	Common assessment
2019	Science communications, longitudinal tracking
2020	Teleconference/Pandemic response

Appendix 1: Survey Questions

What institution are you with (please avoid acronyms)?

What type of program do you run?

Did you run a program in 2020?

What modifications, if any, did you make to your 2020 program that allowed it to run?

What barriers did you experience to running in the way you originally planned? What barriers did students have in participating in the program?

Do you plan to run a program in 2021?

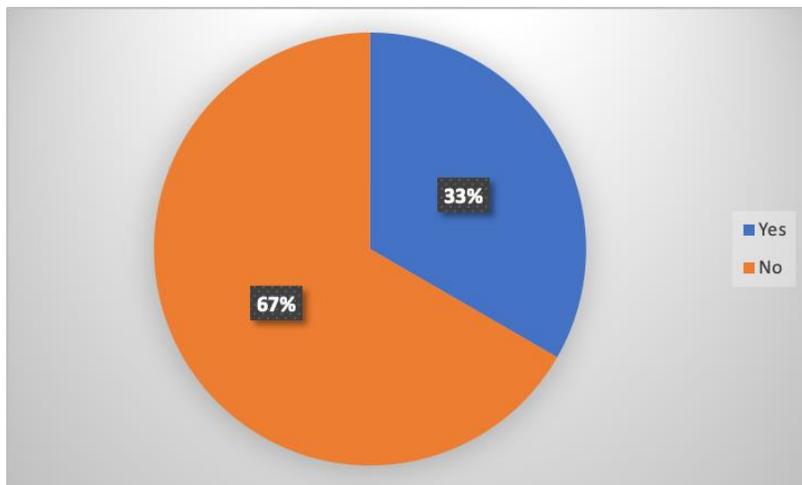
When considering a 2021 program what barriers do you foresee? Examples could include travel restrictions, housing, faculty mentors/projects, other COVID restrictions.

What additional support do you need from NSF or the leadership council?

What additional questions do you have for NSF or the leadership council?

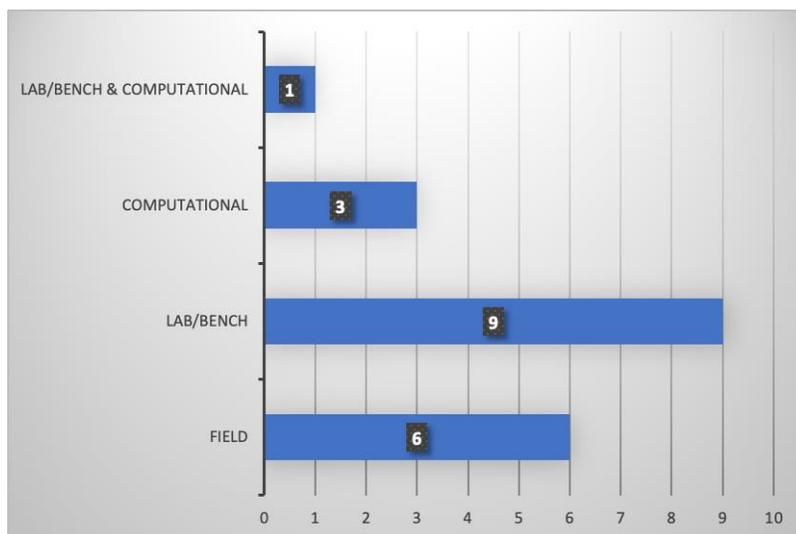
Appendix 2: BIO-REU Pulse Check Survey Results

Did you run a program in 2020?



* 38 (67%) did not run a 2020 program; 19 (33%) did run a 2020 program.

Of those who ran a program: What type of program do you run?



* Respondents indicated they flipped their lab/bench program to be computational/remote

What modifications, if any, did you make to your 2020 program that allowed it to run?

Created new activities

- “We held research seminars with former participants and faculty.”
- “We had three formal student presentations during the ten week-long program.”
- “We had seven interns, each matched with a remote project. They participated in weekly professional development meetings, weekly meetings with our peer mentor team, a three-day R workshop, and two end of program symposia (one for our program and the Leadership Alliance conference).”

Admitted fewer students for a more focused virtual experience

- “Accepted fewer students (5 instead of 10), all relatively local to [town] or our field stations (but only 1 of 5 was a [student]) so students already had their own off-campus housing, or were able to arrange it. All students had their own personal vehicle to use for the program. Minimal in-person team building activities. Workshops and presentations all virtual. Research all in field but with proper safety protocols. Mentor meetings virtual and in-person as part of field work. Provided allowance for off campus housing and Wi-Fi/cellular.”

Comprehensive shift to online format

- “...we ultimately arranged for an entirely remote/online program, and we:
 - 1) adapted most existing projects to permit this;
 - 2) shifted some interns to other projects if their originally planned projects could not proceed in an online-only format;
 - 3) offered deferrals to Summer 2021 for 2 students who preferred to wait for a potential “normal” onsite program/project;
 - 4) ensured that all interns had the necessary technology and data access to participate effectively; and
 - 5) moved all professional development activities online and developed online/remote enrichment and engagement activities for the interns.”
- “Research projects were centered around genomics, bioinformatics, novel representations of biological data and land use dynamics in tropical ecosystems using satellite images. All research topics remained aligned with the intellectual scope of the project. Students participated in virtual meetings 2–5 times a week (more early in the program and less later) for technical training, professional development, and social engagement for cohort cohesion. Program directors, participant faculty and mentors maintained open communication streams with participants through Slack and WhatsApp. Remote meetings were held through Google Meet and Zoom.”

Focused on local students

- “...in one case, materials were dropped off with interns and they carried out an experiment in their yard. “We added a couple mentors who live locally, as well as students who lived locally so they could commute for field work.”

What barriers did you experience to running in the way you original planned? What barriers did students have in participating in the program?

Making connections online

- “The biggest barrier that students seemed to have was with making connections to each other. Overall, we seemed to be pretty successful making students feel integrated into their labs and part of the larger Smithsonian community, but they did not bond as a cohort the way that our past in-person programs where interns all live in one dorm with shared common spaces.”
- “Keeping cohort cohesion is challenging for virtual REU. Social gaming required extra cost that we have no budget for.”

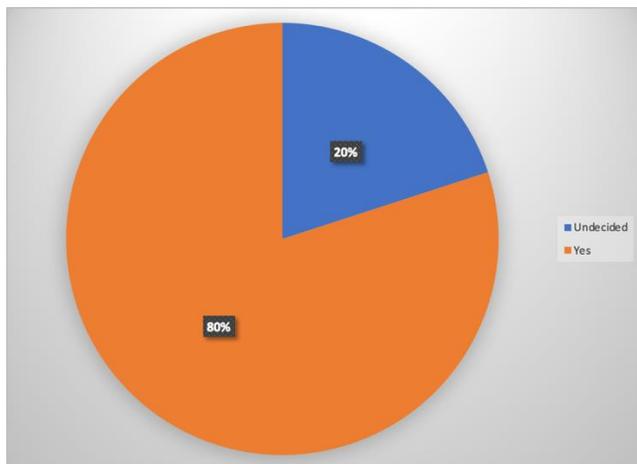
Student working from home challenges

- “Some barriers with regards to student participation were with regards to managing home life and the demands of the program.”
- “A major barrier was poor living conditions- no dedicated workspace/sleeping space and spotty internet.”
- “As a computational program, we didn't have that many barriers to running virtually. Students did have some difficulty in managing their research and program activities, while trying to deal with everything else going on. Having regular conversations with them helped to navigate what a good middle ground was and how they can help take good care of themselves.”

Limited faculty capacity to take on students

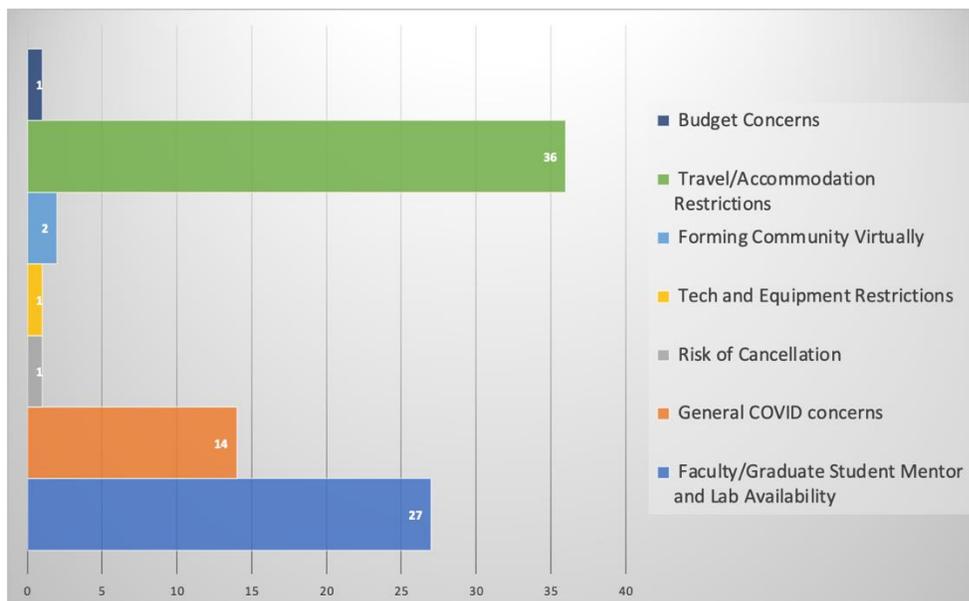
- “Fewer faculty were willing to participate because the program objectives had to change over a two- week period and because at that time many laboratories were closed. We could only offer three internships instead of 8 or 9 due to the limited number of projects.”
- “The greatest barrier was that we had already paired students with mentors when the decision was made by the university to move online. Not all of our mentors were able to provide a remote research experience and so we came up with a tiered approach to participating in our program. Some students who participated part-time then went on to find a job or take other classes all of which changed the level they were able to engage with the program.”

Do you plan to run a program in 2021?



* 40 respondents plan to run a 2021 program; 10 are undecided.

When considering a 2021 program what barriers do you foresee?



The most prevalent concerns related to travel and accommodation. Concerns include university/state government restrictions on non-student visitors or any visitors to their campuses; unavailability of housing for students; inability to apply physical distancing and quarantining measures.

The second most prevalent concern was faculty availability and/or interest in mentoring

students, as well as the availability of lab space on campus. Programs cited faculty burnout and limitations in capacity due to COVID concerns. Lab/bench-based programs indicated physical space was a limitation owing to physical distancing requirements, space capacity limits, and uncertainty around lab closures in Summer 2021.

The third most prevalent concern is categorized as general COVID concerns. Concerns include questions about quarantining and testing protocols and the health risks posed to students and mentors. Questions include how a 14-day on-site quarantine would impact their 10-week long program and how to navigate isolation of a student who contracts COVID.

What additional support do you need from NSF or from leadership council?

Annual Report

- “Guidance on how to fill out an annual report for this year when we did not hold a summer program.”

Flexibility around the cohort size

- “We offered 7 students from our 2020 cohort the option to defer until 2021. We are looking for NSF to provide guidance on the size of a cohort we should admit in 2021 (assuming we can run a our REU). We don't want to reduce opportunity for new students - Will NSF support 10 new students AND 7 deferrals from 2020 (assuming we have the capacity to host that many in mentor labs)?”

Flexibility around funding

- “It would be reassuring to know that we could apply for another NCE to carryover funding for another summer if we're not allowed to host students on campus in 2021.”
- “We could use some salary support for the PI and co-PI if we are just continuing our current program. We are waiting to see whether we are renewed or if we just work off of remaining funds with a no-cost extension. If the latter, we do not have salary funds for the PI and co-PI, nor the modest professional allowances we give to faculty.”
- “We will need to be able to use funds for COVID screening if required by our university/state for on-site participants. It would also be helpful to know if there is any supplemental health insurance we should make available (and whether funds could be used for that). Lodging and meals may cost more this year, since the university is operating on a reduced staffing level due to fewer students on campus.”
- “If we decide to run virtually, will costs like postage, student computing needs, etc. be allowed as expenses from the budget, if we are not using the travel funds for students to meet in person?”
- “It would be helpful for NSF to be very clear about what can and cannot be funded for virtual programs as soon as possible. I feel the prudent way forward is to simultaneously plan for a virtual and in-person program for 2021 and so knowing about any restrictions early on would be helpful.”

Project Guidelines

- “Provide support for developing virtual projects including support for laboratory personnel (grad students, postdocs, research assistants) to develop material for virtual training.”

Community Building

- “Guidance on changes to our approach (from an immersive/self-contained experience recruiting participants from all over to a local program with students living at home only) to accommodate COVID restrictions, with an expectation that scores on the URSSA may be affected adversely through loss of community.”
- “Permission to run an in-house program this summer, involving only College of Charleston students and faculty. That way we can allow students to live in their own housing, avoid long-distance travel, and commute on their own to work in our own laboratories.”
“Of particular interest would be information/suggestions on how to foster “group cohort-building” activities for interns, as well as opportunities for informal “intern-to-intern interactions” and “intern-scientist interactions” beyond formal program activities, mentor-intern interactions, lab-group meetings, etc.”

Communications Support

- “Facilitate ways for better communication between program directors and also better ways to share resources (workshops etc.).”

Program Ideas and Networking

- “Continuing to hear the creative solutions coming from other organizations would be appreciated.”
- “If NSF can connect those sites that are also wet lab based, maybe we can brainstorm and collectively come up with something that will work. Or if we can combine our programs to offer a virtual but much more enriching summer experience to the REU students than each individual program can offer, that would be great.”
- “Last year we did not run a poster session and it would be good to get more ideas about whether its worth trying to do this. We did have a successful symposium. We hope to be able to once again take advantage of other programs (bootcamps and social activities).”
- “It would be great to have a centralized source of best practices from the other remote programs.”

What additional questions do you have for NSF or the leadership council?

Funding	Student Participation	Programmatic Changes
<ul style="list-style-type: none"> • What is the process and/or likelihood of obtaining a second no-cost extension if we have to cancel our program again? • If the program runs online only in 2021, could some "in-person" costs (such as housing and transportation, be used for a future extension? • Will there be negative impacts on future funding if we accept a smaller cohort for 2021? 	<ul style="list-style-type: none"> • Is NSF willing to relax the requirement that participants do not yet have a bachelor's degree? • How do we protect students that lose opportunities by committing to a program that later cancels? • Is NSF trying to take measures/start new efforts in order to increase student participation for 2021 only? We are wondering if any of the changes/initiatives might be long term changes? 	<ul style="list-style-type: none"> • What options have other institutions provided for virtual options when it comes to a field based REU program? • I am thinking of keeping the number of participants to a low level in order to have in-person meetings (if possible) or to keep the Zoom meetings more personal. What other resources do you suggest to help build a sense of community? • Is there a possibility to shift some focus to local students to avoid travel issues related to covid-19, e.g., those already at the home institution or nearby? Populating the REU with local students would avoid the possible need for quarantine upon arrival, residence hall accommodations, etc.

Appendix 3: Frequently Asked Questions

These are questions generated from the Pulse Check survey initiated on 11/4/20, the PI meeting on Nov. 24th and Dec. 3, and follow-up questions received by NSF and the Leadership Council.

Q1. What is the process and/or likelihood of obtaining a second no-cost extension if programs must be cancelled two years in a row?

No-cost extensions should be initiated through research.gov or Fastlane. A first no-cost extension is automatically approved if it is submitted in the appropriate time window. While NSF cannot guarantee automatic approval of a second no-cost extension, they have indicated a strong desire to provide the support PI's need to manage a challenging situation.

Q2. Will programs be granted permission for one year to accept only local (potentially entirely within-institution) students into our program?

NSF encourages PI's to do their best in meeting the recruitment objectives laid out in their NSF proposals. However, the challenges of the pandemic are recognized and PI's are in the best position to evaluate what is the most realistic path moving forward. PI's have considerable discretion on how they operate in 2021. In light of the potential for a lost cohort of scientists, the Leadership Council encourages PI's to make it a priority to host students in 2021, making necessary adjustments.

Q3. Is NSF willing to relax the requirement that participants not yet have a bachelor's degree?

Congress has established a law that limits use of REU funds to supporting students who have not graduated. Without congressional action, NSF does not have discretion to change this limitation. NSF and the Leadership Council have been exploring ways to support students who have graduated, but currently there is no funding to support such students.

Q4. Will there be negative impacts on future funding if we accept a smaller cohort for 2021?

NSF has not issued formal guidance to reviewers concerning how programs have had to be flexible to operate. However, there is general understanding about the challenges and need for flexibility in reviewing how programs operated in 2020 and 2021.

Q5. How do we protect students that lose opportunities by committing to a program that later cancels?

This will need to be handled on a case-by-case basis. Programs are encouraged to communicate transparently and early with participants about the likelihood of a program canceling.

Q6. Can we offer experiences to those who were admitted in 2020 without running a new admissions cycle?

Each site director will need to decide how to handle admissions based upon their unique circumstances. NSF has encouraged all programs to run an admissions cycle that considers students who were not previously accepted into a program cancelled in 2020.

Q7. If the program runs online only in 2021, could some "in-person" costs (such as housing and transportation, be used for a future extension?

Yes.

Q8. Can NSF funds be used to cover covid testing?

Yes.

Q9. Are there supplements available for the additional expenses (COVID testing; single occupancy housing, staffing, etc.)? Or for previously unallowable expenses (working from home setup, computers, hotspots)?

Yes. PI's can request supplemental funds necessary to operate given the limitations associated with the pandemic PI's are encouraged to contact their program officer before submitting a request.

Q10. Should we be getting supplemental health insurance for the students, and if so, how can this be funded?

Site directors will need to evaluate health needs of students on a case by case basis. If they determine supplemental health insurance is needed because of the pandemic, they can make a supplemental request (see question above).

Q11. Do programs need to notify NSF of a cancellation, a change in the length of the program, a change in the number of students, or other significant changes?

Any significant change of scope must be approved by NSF, including cancellation. We encourage you to email the program officer with a description of planned changes. She will notify you if the change in scope is big enough that they should be formally submitted through Fastlane or research.gov.

Q12. If programs have enough mentors to serve more students in 2021 to catch up with a backlog is there additional funding?

Site directors are encouraged to email their program officer and discuss the possibility of pulling forward 2022 funds into 2021, and then request a supplement to replace the 2022 funding. If the plan is approved, they will need to submit a request for a change in scope.

Q13. Is a change to running a program virtually considered a change in scope that needs prior approval?

Simply changing the delivery format is not a change in scope. Changing the types of research is (e.g., going from a lab to a computational program). If you have any questions at all, you are encouraged to email the program officer and she will let you need if a formal request is needed.

Q14. Should off-site/remote students be provided housing and meal budgets as they are still incurring these costs, particularly low-income students?

PI's have broad discretion on how they handle housing and meals, including for off-site and remote students. Students should be treated equally, however.

Q15. Is there a recommendation on the degree to which programs prioritize students from last year (who were accepted but lost an experience because the program canceled) versus students applying this year.

Each site director will have to make their own decision. However, it is recommended to not completely disregard new applicants.

Q16. Can the REU grant cover housing costs for quarantining/isolating a student that tests positive?

Yes. If additional funds are needed, you may initiate a supplemental request with your program officer.

Q17. Are there other programs that can take the students accepted last year were unable to participate because the program was canceled?

We are currently exploring options to serve more undergraduates, but do not have a defined program for such students.

Q18. Can students work part-time during the program?

Documenting time and effort for individuals working on a grant is important and each institution has its own policies for tracking that. We encourage you to work closely with your home

institution in ensuring your policies are met. It is important to recognize that students are dealing with a range of pressures and you may need to be careful about putting restrictions on how students use their time outside a regular work week.

Q19. We plan to have our program in-person but have too few mentors (as they have a backlog of research and travel now). Do we have to gain approval to broaden our mentor pool past the list of mentors submitted in our grant?

Site Directors have considerable flexibility in managing their mentor pools within the scope of work identified in the grant.

Q20. Is there online content that can be shared between programs.

We recommend you share content or suggestions for desired content on the REU Slack Channel.

Q21. How much flexibility is there to move funds around?

You cannot move money out of participant costs without prior approval from NSF. You have broad discretion to move money between categories within participant support costs, as well as between categories outside participant support costs, including using PI travel funding to support mentors.

Q22. How do we fill out the NSF annual reports for programs that did not run their program due to the pandemic?

You will need to fill out an annual report, even if you canceled the program. There is a section within the annual report that asks you to address any significant issues that arose in the project. You can provide details of the problems you ran into there.

Q23: If programs move to working virtually, will that create barriers to student participation because of bandwidth, hardware, or software challenges?

Site directors should consider conducting tech surveys of students and ensuring students have the resources they need to participate.

Q24: Are there any tips for virtual programs supporting students who are hard of hearing?

Programs have not had success with automated captioning on zoom calls and have relied upon human interpreters.