

Audit of NSF's Controls over Graduate Research Fellowship Program Funding

NATIONAL SCIENCE FOUNDATION
OFFICE OF INSPECTOR GENERAL

March 30, 2023
OIG 23-2-004





AT A GLANCE

Audit of NSF's Controls over Graduate Research Fellowship Program Funding

Report No. 23-2-004

March 30, 2023

WHY WE DID THIS AUDIT

NSF's Graduate Research Fellowship Program (GRFP) recognizes and supports outstanding graduate students who are pursuing full-time, research-based master's and doctoral degrees in science, technology, engineering, and mathematics (STEM) or STEM education. In its fiscal year 2023 budget request to Congress, NSF requested \$355.51 million for the Division of Graduate Education to fund GRFP. We performed this audit to determine whether NSF properly distributes, monitors, and accounts for GRFP funding.

WHAT WE FOUND

Although NSF distributed, monitored, and accounted for most GRFP funding as required, improvements are needed to reduce financial and management risks. For example, NSF did not always ensure all GRFP reporting and participation requirements were consistently enforced. NSF also did not always supply the information or guidance institutions needed to properly manage awards. This occurred, in part, because NSF did not have sufficient standard operating procedures for the GRFP or adequately train GRFP staff. In addition, NSF had insufficient information technology controls to determine award amounts and ensure awards were made only in support of eligible fellows.

Since we began our audit, NSF has started to address some of these areas, such as hiring program leadership and additional staff to oversee GRFP, obtaining contractor support to document its existing processes, revising its Administrative Guide, and improving its IT controls.

WHAT WE RECOMMEND

We made six recommendations to strengthen NSF's oversight of GRFP.

AGENCY RESPONSE

NSF agreed with all six recommendations and has initiated several responsive actions, such as increasing resources, updating the GRFP Administrative Guide, and conducting webinars to communicate program requirements and responsibilities.

FOR FURTHER INFORMATION, CONTACT US AT OIGPUBLICAFFAIRS@NSF.GOV.



National Science Foundation • Office of Inspector General
2415 Eisenhower Avenue, Alexandria, Virginia 22314

MEMORANDUM

DATE: March 30, 2023

TO: Karen A. Marrongelle
Chief Operating Officer
Office of the Director

FROM: Mark Bell [REDACTED]
Assistant Inspector General
Office of Audits

SUBJECT: Final Report No. 23-2-004, *Audit of NSF's Controls over Graduate Research Fellowship Program Funding*

Attached is the final report on the subject audit. We have included NSF's response to the draft report as an appendix. This report contains six recommendations aimed at improving NSF's oversight of the Graduate Research Fellowship Program. NSF concurred with all of our recommendations. In accordance with Office of Management and Budget Circular A-50, Audit Followup, please provide a written corrective action plan to address the report recommendations. In addressing the report's recommendations, this corrective action plan should detail specific actions and associated milestone dates. Please provide the action plan within 60 calendar days.

We appreciate the courtesies and assistance NSF staff provided during the audit. If you have any questions, please contact Elizabeth Kearns, Director of Audit Execution, at 703.292.8483 or ekearns@nsf.gov.

CC: Christina Sarris, Michael Wetklow, Sanya Clark, Dan Reed, Ann Bushmiller, Jacqueline Huntoon, Victor McCrary, Sylvia Butterfield, John Veysey, Steve Willard, Charisse Carney-Nunes, Jon-On Hahm, Criselda Cruz, Christopher Hill, Teresa Grancorvitz, Daniel Hofherr, Quadira Dantro, Alexander Wynnyk, James Moore, Jolene Jesse, Jamie French



TABLE OF CONTENTS

Background.....	1
Results of Audit.....	2
Enforcement of GRFP Requirements.....	3
NSF’s Guidance for Institutions.....	5
GRFP Office Procedures and Guidance	6
IT Controls.....	7
Recommendations	8
OIG Evaluation of Agency Response	8
Appendix A: Agency Response.....	9
Appendix B: Required Reports and Actions for Fellows and Institutions.....	10
Appendix C: Objective, Scope, and Methodology.....	11

ABBREVIATIONS

COE	Cost of Education
GRFP	Graduate Research Fellowship Program
IT	Information Technology
PER	Program Expense Report
STEM	Science, Technology, Engineering, and Mathematics



Background

The National Science Foundation is an independent federal agency created by Congress in 1950 “[t]o promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense; and for other purposes” (Pub. L. No. 81-507). With an annual budget of \$9.5 billion (FY 2023), NSF funds approximately 25 percent of all federally supported basic research conducted by America’s colleges and universities. In fields such as mathematics, computer science, and the social sciences, NSF is the major source of federal funding.

GRFP Mission and Goals

The purpose of NSF’s Graduate Research Fellowship Program (GRFP) is to help ensure the vitality and diversity of the scientific and engineering workforce of the United States. The program recognizes and supports outstanding graduate students who are pursuing full-time, research-based master’s and doctoral degrees in science, technology, engineering, and mathematics (STEM) or in STEM education. In its fiscal year 2023 budget request to Congress, NSF requested \$355.51 million to fund the GRFP.

GRFP was launched in 1952 and is one of NSF’s oldest programs. Each year, the program receives about 13,800 applications, and it awards about 2,060 fellowships. GRFP is a critical program in NSF’s overall strategy to develop the globally engaged workforce necessary to ensure the Nation’s leadership in advancing science and engineering research and innovation.

Financial Support to GRFP Fellows and Institutions

GRFP provides 3 years of financial support for fellows, which they must use within a 5-year period. The fellow’s institution of higher education receives the GRFP award and distributes a stipend to the fellow. At the time of our audit, the stipend was \$34,000 for each 12-month fellowship year.¹ Additionally, the institution receives a fixed cost-of-education (COE) allowance, which was \$12,000 at the time of our audit, in lieu of all required tuition and fees for each of the 3 years the fellow chooses to use the fellowship funding.²

Each year, fellows identify their planned status for funding: tenure, reserve, military leave, or medical leave. “Tenure” means the fellow is receiving GRFP financial support during the fellowship year, is conducting full-time research and/or coursework under the direction of an advisor, and is making satisfactory progress as certified by the institution. “Reserve” means the fellow is enrolled in an institution of higher education but is not receiving a GRFP stipend.

¹ The fellow may use the financial support in any three 12-month units, starting June 1 or September 1, over the 5-year period that begins in the fellow’s initial award year.

² For fellows in good standing on tenure for at least 6 months during a year, the institution is entitled to receive the full COE allowance; for fellows on tenure for 1-5 months, the institution can receive half of the allowance.



Reserve status allows fellows to incorporate professional development opportunities into their graduate programs.

Administration of GRFP Awards

NSF's GRFP Office, within the Division of Graduate Education in the Directorate for STEM Education,³ is responsible for GRFP program management and oversight. NSF GRFP *Administrative Guides for Fellows and Coordinating Officials (Administrative Guide)*,⁴ outlines the administrative policies and procedures for the fellow and the fellow's graduate, degree-granting institution (GRFP institution). The Administrative Guide incorporates all policies, rules and regulations, and the terms and conditions found in the Fellowship Offer Letter, the annual GRFP Program Solicitation, and the Notice of Grant Award.

Per the Administrative Guide, the awardee institution is responsible for financial management of the award and disbursement of stipend funds to the individual fellow. The awardee institution is also responsible for the conduct and results of GRFP-supported projects and activities.

Audit Objective

The objective of this audit was to determine whether NSF properly distributes, monitors, and accounts for GRFP funding. To accomplish this objective, we evaluated NSF's application of program requirements, conducted additional reviews for three judgmentally sampled GRFP institutions, and met with NSF and institution staff responsible for administering the fellowships. Our audit scope included active GRFP awards from 2010 to 2020. During this timeframe, NSF administered a total of \$2.77 billion in 3,530 awards and amendments to 305 institutions in support of GRFP fellows. Please see Appendix C for more information about our objective, scope, and methodology.

Results of Audit

Although NSF distributed, monitored, and accounted for most GRFP funding as required, improvements are needed to reduce financial and management risks. For example, NSF did not always ensure all GRFP reporting and participation requirements were consistently enforced. NSF also did not always supply the information or guidance institutions needed to properly manage awards. This occurred, in part, because NSF did not have sufficient standard operating

³ The Directorate was previously known as the Directorate for Education and Human Resources.

⁴ NSF 11-031, 2011; NSF 12-061, 2012; NSF 13-085, 2013; and NSF 16-104, 2016: *Graduate Research Fellowship Program Administrative Guide for Fellows and Coordinating Officials 2011, 2012, 2013, and 2016*, respectively. These Administrative Guides applied to the 2011-2021 fellowship years. In March 2022, NSF issued NSF 22-067, *Graduate Research Fellowship Program Administrative Guide* to address emerging audit issues.



procedures for the GRFP or adequately train GRFP staff. In addition, NSF had insufficient information technology controls to determine award amounts and ensure awards were made only in support of eligible fellows.

Since we began our audit, NSF has started to address some of these areas, such as hiring program leadership and additional staff to oversee GRFP, obtaining contractor support to document its existing processes, revising its Administrative Guide, and improving its IT controls.

Enforcement of GRFP Requirements

NSF distributed, monitored, and accounted for most GRFP funding as required. However, NSF awarded funding to some institutions in support of fellows who did not meet participation requirements, continued funding some institutions that did not comply with reporting requirements, and continued funding an institution that did not exempt fellows from paying tuition and fees as required. Further, we found instances in which fellows received more or less than the full stipend amount to which they were entitled.

NSF Did Not Consistently Enforce GRFP Participation Requirements

NSF did not always use information provided by fellows or GRFP institutions to ensure funding was provided only for participants complying with participation requirements; for example:

- Between 2010 and 2019, NSF awarded approximately \$824,231 in GRFP funding to institutions in support of fellows the institutions reported had exceeded program limits for time, COE allowance, and stipend.⁵
- Between 2012 and 2019, NSF awarded more than \$1.2 million to institutions in support of fellows the institutions reported had made unsatisfactory progress or did not submit required activity reports.⁶

NSF Did Not Always Enforce GRFP Reporting Requirements

According to the Administrative Guide, institutions must fulfill specific reporting requirements before receiving GRFP funding each year, including certifying the program expense report (PER), as outlined in Appendix B. For example, NSF relies on PERs to determine award balances and additional funding amounts. PERs specify stipend and COE allowance information for the previous fellowship year. According to NSF records, from 2016 to 2019, NSF awarded

⁵ As previously discussed, the GRFP program is designed for fellows to be enrolled in the program for a 5-year period, and receive support for 3 of those 5 years, or 36 months. The institution also receives COE support during the 3 years that the fellow is receiving funding.

⁶ Calculation based on information submitted by institutions in NSF's web-based grants management system, FastLane.



approximately \$46 million in GRFP funding to 20 institutions that did not certify a PER as required.

NSF also requires institutions to submit an annual completion report certifying the completion status — in progress, completed, graduated, transferred, or withdrawn — of fellows at the institution and degree, if awarded.⁷ The rate of noncompliance for submitting completion reports peaked in 2018, with 61 percent of institutions not complying, and decreased to 38 percent noncompliance in 2019. As we previously reported,⁸ one institution in our sample did not submit a completion report between 2016 and 2021.

These reports are important to ensure federal funds are properly expended and program requirements are properly implemented. When these reports are missing or inaccurate, NSF cannot ensure institutions are receiving the correct amount of funding.

NSF Did Not Always Enforce Tuition Exemption Requirements

The Administrative Guide requires institutions to exempt fellows from paying tuition and fees typically charged to graduate students of similar academic standing. However, as previously reported,⁹ we found one institution was holding fellows responsible for tuition in excess of NSF's COE allowance and allowing fellows to cover the tuition shortfall through research or teaching positions. In response to our report, NSF updated the Administrative Guide to clarify its position that institutions cannot use teaching or research assignments to make up the difference between NSF's COE allowance and the institution's regular tuition and fees.

NSF Did Not Monitor Institutions' Policies and Procedures for Paying Fellows

According to the Administrative Guide, institutions are responsible for paying fellows accurately. However, NSF did not monitor institutions to ensure they had the necessary policies and procedures to pay fellows the correct amount. We previously reported about instances in which fellows received more or less than the full stipend amount to which they were entitled.¹⁰ For example, an institution overpaid a fellow \$1,769 in 2016 because a department entered the incorrect stipend amount into the institution's payroll system; the institution also underpaid another fellow by \$1,417, or half a month of stipend, because of incorrect proration policies. As a result of our audit, the institution agreed to modify its graduate appointment and payroll

⁷ The completion report was introduced in NSF 13-085.

⁸ [OIG Report No. 22-6-006](#), *The Massachusetts Institute of Technology's Administration of Graduate Research Fellowship Program Funding*

⁹ [OIG Report No. 22-6-001](#), *The Massachusetts Institute of Technology's Noncompliance with Certain Graduate Research Fellowship Program Terms and Conditions*, February 2022

¹⁰ [OIG Report No. 22-6-006](#), *The Massachusetts Institute of Technology's Administration of Graduate Research Fellowship Program Funding*



systems to automate the calculation and charging of stipends consistent with the requirements of the Guide.

NSF's Guidance for Institutions

NSF provides administrative guidance for institutions through its fellowship solicitation and the Administrative Guide but does not provide any specific training on GRFP administration. We found that the Administrative Guide was not always sufficient to fully support institutions in administering the award. For example, the Guide did not contain complete instructions for splitting the COE allowance between institutions when fellows transfer from one institution to another, or clearly define which fellowships could not be combined with GRFP funding.

Splitting COE Allowances for Transferring Fellows

At the time of our audit, the Administrative Guide did not contain instructions for splitting COE allowance between institutions when fellows transfer to different institutions during the fellowship year. According to the Guide, institutions receive \$6,000 of COE for 1 to 5 months of tenure and \$12,000 COE for 6 to 12 months. We found 27 instances in which institutions cumulatively claimed \$139,000 more than the annual COE limit of \$12,000 per fellow. As a result of our audit, NSF clarified in its March 2022 update to the Administrative Guide that if the fellow is at the original institution for 6 months or more, that institution would receive the full COE allowance and the receiving institution would not receive COE allowance for the fellow during that fellowship year. However, NSF does not have a specific IT control to prevent institutions from inadvertently exceeding the COE limit in this situation.

Support From Other Federal Fellowships

GRFP fellows cannot concurrently accept or combine support from another federal graduate fellowship¹¹ with GRFP funding. However, because the Administrative Guide did not clearly define what would be considered support from another federal graduate fellowship, fellows inconsistently applied this condition to their acceptance of the GRFP award. For example, one fellow accepted a GRFP award concurrently with a Department of State Fulbright award, which was not identified in the Administrative Guide, while another Fulbright fellow declined the GRFP award as required. As a result of our audit, NSF added the Department of State to its list of examples of U.S. government agencies from which fellows cannot concurrently accept fellowship support. However, NSF does not have a process for reviewing other fellowships, scholarships or grants reported by GRFP fellows to determine if the fellows remain eligible for GRFP funding.

¹¹ The Guide defines federal graduate fellowships as "awards that are offered to individuals from the US Government ... to support the graduate education of individuals."



Table 1 contains additional examples of insufficient guidance for institutions.

Table 1. Additional Missing or Unclear Guidance to GRFP Institutions

Missing Guidance
<i>The Administrative Guide did not provide a definition or instructions regarding the following:</i>
If institutions should request a supplement for negative award balances
How institutions should claim COE allowance when a fellow's tenure spans more than 3 years because of approved deferments
What Special Reserve Status means and how to use it
When an institution can receive COE allowance even though the fellow does not receive a stipend
How to handle the overlapping months when a fellow changes from fall to summer status
Unclear Guidance
<i>The Administrative Guide did not provide sufficient instruction to determine how to apply the following requirements:</i>
The information required and length of time allowed for fellows to take paid medical leave - see page 9 and 11 of 2022 Guide.
What corrective measures NSF will allow institutions to take to avoid NSF terminating fellowships for non-compliance with fellowship terms and conditions - see page 20 of 2022 Guide
Who at NSF will approve changes in a fellow's primary field of study after the first year and what criteria will be used - see page 20 of 2022 Guide

Source: NSF OIG-generated based on the 2016 Administrative Guide

GRFP Office Procedures and Guidance

NSF staff and external experts¹² previously identified weaknesses in NSF's financial oversight of GRFP and the systems supporting the program, including the need for increased resources, insufficient standard operating procedures, largely manual and unreliable financial processes, and some unavailable or inaccurate financial records. We also found the GRFP office needed defined roles and responsibilities; better standard operating procedures, guidance, and training; and additional controls to ensure program accountability. For example:

- We found GRFP staff sometimes prioritized disbursement of GRFP funding over enforcement of GRFP requirements. Some program staff reported not enforcing GRFP requirements due to a reluctance to negatively affect a fellow's graduate education. Leadership and staff, the latter of which reported having heavy workloads, also reported prioritizing the selection of fellows and disbursement of funds over accountability.
- The GRFP office experienced leadership turnover and did not have sufficient guidance to educate new supervisors on the program. GRFP leadership and staff told us they did not always understand the funding determination process.

¹² 2018 Committee of Visitors Reviews. NSF relies on external reports, such as these Committee of Visitors reviews, to provide it with external expert judgments in two areas: (1) assessments of the quality and integrity of program operations; and (2) program-level technical and managerial matters pertaining to proposal decisions.



- Staff also noted that program policies were difficult for the public to find and not user friendly, resulting in numerous inquiries from institutions.
- Institutions in our sample stated they received inaccurate guidance from NSF or had to repeatedly e-mail NSF to obtain guidance, such as for discrepancies between institution and NSF records, errors in PERs, problems with medical leave requests, and questions about when new fellows could begin. For example, one institution noted that NSF records showed some fellows had more tenure months than what the institution's records reflected. The institution said it e-mailed NSF but never received a response, so it paid the fellows for the additional tenure months.

Since we began our audit, the GRFP Office has taken action to address some of these areas, such as hiring a project manager, obtaining contractor support to document its existing processes, and revising its Administrative Guide. NSF and GRFP senior leaders have also acknowledged the need for additional controls and have continued taking action to strengthen the program. For example, as a result of our audit, NSF hired a senior program manager and added multiple employees to oversee GRFP.

IT Controls

At the time of our audit, NSF had insufficient IT controls to determine award amounts and ensure awards were made only in support of eligible fellows. For example, the GRFP module in FastLane, NSF's web-based grants management system, did not have adequate controls to detect instances in which institutions claimed more COE or stipend support than allowed.

In addition, fellows were allowed to change their status, such as from "tenure" to "reserve," in the GRFP FastLane module after an institution had certified its PER. The status updates did not flow through to the PER, and as a result, NSF could not ensure the COE or stipend amount was correct. To address this issue, NSF's Division of Information Systems implemented new controls to notify institutions when fellows change their status in FastLane after the institution has certified its PER. This notification prompts institutions to re-certify the PER if necessary. GRFP management also receives a copy of the notification to the institution.



Recommendations

We recommend that the Chief Operating Officer, Office of the Director, ensure that the Office of Budget, Finance and Award Management; Directorate for STEM Education; and the Division of Information Systems take the following actions to improve the Graduate Research Fellowship Program:

1. Develop an organizational structure for NSF's Graduate Research Fellowship Program that identifies staff roles and responsibilities to ensure accountability for financial and programmatic oversight.
2. Develop standard operating procedures and training for NSF's Graduate Research Fellowship Program staff to ensure sufficient financial and programmatic oversight.
3. Develop a monitoring program to ensure institutions have the necessary policies and procedures to comply with program requirements in accordance with the Graduate Research Fellowship Program Administrative Guide.
4. Provide additional guidance and clarification for institutions to support them in administering Graduate Research Fellowship Program awards.
5. Conduct outreach to ensure institutions understand NSF's expectations for managing Graduate Research Fellowship Program awards.
6. Develop and implement additional information technology controls and data analytics to enforce Graduate Research Fellowship Program terms and conditions.

OIG Evaluation of Agency Response

NSF agreed with all six recommendations and has initiated several responsive actions, such as increasing resources to better implement a robust oversight and effective administration of the program; updating the GRFP Administrative Guide to clarify policies and procedures; conducting webinars over the past year to communicate program requirements and responsibilities for applicants, fellows, and institutions; and enhancing IT controls for award administration. We have included NSF's response to this report in its entirety in Appendix A.



Appendix A: Agency Response



National Science Foundation

MEMORANDUM

Date: March 28, 2023

To: Allison Lerner, Inspector General, NSF

From: Karen A. Marrongelle, Ph.D., Chief Operating Officer, NSF [REDACTED]

Subject: NSF's Response to the OIG Official Draft Report, *Audit of NSF's Controls over Graduate Research Fellowship Program Funding*

NSF appreciates the opportunity to review the OIG's Official Draft Report for its audit of NSF's Graduate Fellowship Research Program (GRFP). We recognize the rigor of the OIG's engagement, which yielded strong findings that were promptly communicated to NSF over the course of the audit. The OIG's timely feedback helped NSF identify the scope of issues presented and chart a concrete path for improvement of GRFP controls well before the audit concluded.

NSF agrees with all of the OIG's recommendations, and we have already initiated several responsive actions as well as broader improvements. More specifically, NSF has increased GRFP staffing to align with the level of resources required for robust oversight and effective administration of the program, while also leveraging existing expertise related to financial controls and risk management. NSF also updated the GRFP Administrative Guide (GRFP Guide) for fellows and their institutions in 2022 to clarify policies and procedures, including eligibility requirements for fellows and application of the Cost of Education (COE) allowance by institutions, in a more user-friendly format. NSF amplified the impact of the issuance of the updated and improved GRFP Guide by conducting webinars over the past year to communicate program requirements and responsibilities for applicants, fellows, and institutions, including three webinars in 2023 which have drawn, collectively, hundreds of attendees. NSF has also made several enhancements to information technology (IT) controls for award administration, including controls related to the Cost of Education allowance, stipend expenditures, Grant Roster Reports, and Program Expense Reports. Finally, NSF assessed GRFP financial controls in 2022 by conducting payment testing which indicated that the program is below the statutory threshold for significant improper payments within the Payment Integrity Information Act of 2019 (PIIA).

The GRFP program, which originated shortly after NSF's inception, provides support for generations of scientists across the United States. We strive for the program to be a gold standard for fellowships across all Federal science agencies. Informed by the OIG's audit work, NSF will continue to improve oversight of GRFP and to provide support for the next generation of scientists. We look forward to issuance of the OIG's final report and timely implementation of all recommendations.

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Appendix B: Required Reports and Actions for Fellows and Institutions

According to the 2016 *GRFP Administrative Guide for Fellows and Coordinating Officials* (the Administrative Guide), NSF generally provides incremental funding to institutions on an annual basis upon fulfillment of these requirements:

Report or Action	Requirement and Purpose	Deadline	Consequence for Noncompliance
Activities Report (AR)	For the duration of the 5-year fellowship, each fellow must submit the annual AR to their institution for certification. The AR summarizes the fellow's accomplishments, funding, and career plans. By certifying the AR, the institution confirms the fellow's continued eligibility and satisfactory degree progress.	Fellow submits annually in May and finally within 30 days of graduation or fellowship completion or termination.	Institution rates fellow as making unsatisfactory progress, and NSF terminates the fellowship. However, NSF will allow the institution to take corrective measures before terminating the fellowship.
Declare Fellowship Status	GRFP provides each fellow 3 years of funding, and the fellow chooses when to use the funding during the 5-year fellowship period. For the duration of the 5-year fellowship, each fellow must declare their expected fellowship status (tenure, reserve, or military or medical deferral) for the upcoming academic year in NSF's GRFP Fastlane module. The fellow is on tenure when using GRFP funding and on reserve or military or medical deferral when not.	Fellow declares in May.	NSF terminates the fellowship at the end of the year in which the fellow did not declare status. However, NSF will allow the institution to take corrective measures before terminating the fellowship.
Grants Roster Report (GRR)	Each institution must certify its fellows' expected fellowship status for the upcoming academic year. The GRFP Office uses the GRR to estimate how much GRFP funding each institution may need in the coming year.	Institution submits in May/June.	The Guide does not state a specific enforcement action for noncompliance.
Program Expense Report (PER)	Each institution must certify the actual fellowship status and expenditures incurred for the completed academic year. The GRFP Office uses this report to determine how much funding to distribute to each institution for the upcoming academic year.	Institution submits in October.	NSF will not issue an additional award to an institution with unsubmitted PERs.
Completion Report (CR)	Each institution must certify the completion status (in progress, completed, graduated, transferred, withdrawn) of its fellows and any degrees awarded.	Institution submits in October.	The Administrative Guide does not state a specific enforcement action for noncompliance.

Source: NSF OIG-generated summary of requirements from the 2016 *Graduate Research Fellowship Program Administrative Guide for Fellows and Coordinating Officials*.



Appendix C: Objective, Scope, and Methodology

The objective of this performance audit was to determine whether NSF properly distributes, monitors, and accounts for GRFP funding. Our audit scope included active GRFP awards from 2010 to 2020. During this timeframe, NSF administered a total of \$2.77 billion in 3,530 awards and amendments to 305 institutions in support of GRFP fellows. To accomplish our objective, we evaluated information at both NSF and three judgmentally sampled GRFP institutions as described below.

We performed the following procedures to determine how well NSF monitored GRFP awards to ensure compliance with award terms and conditions, distributed funds, and tracked award balances:

- Gained an understanding of the internal control structure applicable to the scope of this audit by:
 - Reviewing GRFP Administrative Guides effective 2010–2020 and associated GRFP Award Solicitations; and
 - Interviewing staff from relevant NSF divisions, such as the Division of Graduate Education, the Division of Information Systems, the Budget, Finance, and Award Management, and the Division of Grants Administration.
- Evaluated NSF's application of program requirements by:
 - Analyzing \$2.3 billion of stipend and COE amounts reported on Program Expense Reports from 2010–2019 for all institutions;
 - Comparing fellows with unsatisfactory performance or unsubmitted activity reports to fellow payments on the program expense reports; and
 - Determining the number of institutions that inappropriately received additional funding from 2016 to 2019 because they had outstanding PERs in NSF's GRFP report system.
- Reviewed NSF tests of application eligibility to determine if requirements were applied correctly.
- Evaluated the effectiveness of NSF accounting for award balances by analyzing the GRFP Financial Tracking tool for the three sampled institutions.

We also performed tests of GRFP data for three judgmentally sampled institutions: the University of Maine, Purdue University, and the Massachusetts Institute of Technology. We gained an understanding of the program at each institution by reviewing applicable graduate school or GRFP policies; observing how the institution administered the program; analyzing GRFP program reports, such as the grants roster report, program expense report, completion report, and annual activity report; and interviewing staff responsible for the GRFP program functions. Specifically:



- We reconciled \$934,000 of stipend the University of Maine reported in its PERs from 2011 to 2018 to its general ledger expenses to determine if the institution disbursed the correct amount to the fellow and reported the same amount in the PER.
- We analyzed \$11.8 million of stipend reported by Purdue University from 2012 to 2019 in its PERs for 167 active fellows.
- We reconciled \$60 million of stipend the Massachusetts Institute of Technology reported its PERs from 2011–2018 to its general ledger expenses to determine if the institution disbursed the correct amount to the fellow and reported the same amount in the PER.

We conducted this performance audit between February 2020 and February 2023 in accordance with *Generally Accepted Government Auditing Standards*. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions, based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions.

Key contributors to this report include: Elizabeth Kearns, Director, Audit Execution; Vashti Young, Audit Manager; Jeanette Hyatt, Audit Manager; Wendell Reid, Audit Manager; Darrell Drake, Senior Auditor; Ashley Lippolis Aviles, Senior Management Analyst; Brittany Moon, Data Analytics Project Manager; Jennifer Miller, Director, Compliance Analytics; Dan Buchtel, Deputy Assistant Inspector General for Audits; Elizabeth Argeris Lewis, Executive Officer and Communications Analyst; and Jeremy Hall, Independent Report Referencer.



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