

NATIONAL SCIENCE FOUNDATION
OFFICE OF INSPECTOR GENERAL
OFFICE OF INVESTIGATIONS

CLOSEOUT MEMORANDUM

Case Number: A11060044

Page 1 of 1

Our investigation determined that the Subject¹ knowingly fabricated data and provided the data to his research colleagues. NSF made a finding of research misconduct by the Subject; sent a letter of reprimand to the Subject; debarred the Subject for one year required the Subject to submit certifications to the Assistant Inspector General for Investigations (AIGI), NSF OIG for two years after debarment ends; required the Subject's employer to submit assurances to the AIGI of NSF OIG for two years after debarment ends; prohibited the Subject from serving as a reviewer of NSF proposals for two years; and required the Subject to provide certification to the AIGI that he has completed a course on the responsible conduct of research.

This memo, the attached Report of Investigation, and the letter from NSF with a finding of research misconduct constitute the case closeout. Accordingly, this case is closed.

¹ [REDACTED]

National Science Foundation Office of Inspector General



Report of Investigation Case Number A11060044 September 27, 2013

**This Report of Investigation is provided to you
FOR OFFICIAL USE ONLY.**

It contains protected personal information, the unauthorized disclosure of which may result in personal criminal liability under the Privacy Act, 5 U.S.C. § 552a. This report may be further disclosed within NSF *only* to individuals who *must* have knowledge of its contents to facilitate NSF's assessment and resolution of this matter. This report may be disclosed outside NSF *only* under the Freedom of Information and Privacy Acts, 5 U.S.C. §§ 552 & 552a. Please take appropriate precautions handling this report of investigation.

Executive Summary

A University's investigation established that:

- The Subject fabricated two images in performance of sponsored research.

OIG concluded that:

- **Act:** The Subject fabricated two images in performance of sponsored research;
- **Intent:** The Subject acted knowingly; and
- **Standard of Proof:** A preponderance of the evidence supports the conclusion that the Subject's acts were a significant departure from the standards of the research community, and therefore constitute research misconduct.

OIG recommends that NSF:

- Send the Subject a letter of reprimand notifying him that NSF has made a finding of research misconduct.
- Debar the Subject for 1 year.
- Require the Subject to certify to the Assistant Inspector General for Investigations (AIGI) his completion of a responsible conduct of research training program and provide documentation of the program's content within 1 year of NSF's finding. The instruction should be in an interactive format (*e.g.*, an instructor-led course).

For a period of 2 years from the date of NSF's finding:

- Require for each document (proposal, report, etc.) to which the Subject contributes for submission to NSF (directly or through his institution),
 - the Subject to submit a certification to the AIGI that the document does not contain plagiarism, falsification, or fabrication.
 - the Subject to submit assurances from a responsible official of her employer to the AIGI that the document does not contain plagiarism, falsification, or fabrication.
- Bar the Subject from participating as a peer reviewer, advisor, or consultant for NSF.

University's Investigation

We received a university report¹ describing an investigation of alleged research misconduct by a graduate student Subject² who had received NSF support.³ The report concluded that the Subject improperly manipulated two scanning electron microscope (SEM) images, and presented the images to members of his research group. The Subject manipulated the edges of the structures in the images to make them appear sharper than actually measured. The following facts were established by the university investigation:

- the Subject provided an SEM image to a research colleague⁴ on July 13, 2009 that appeared to be manipulated⁵
- the colleague recovered the original data file from the SEM instrument, and concluded that the provided image was manipulated⁶
- a postdoctoral fellow⁷ in the research lab was apprised of the situation and contacted the supervising professor⁸ on July 21, 2009
- the Subject provided a second SEM image to a research colleague on or about July 21, 2009 that appeared to be similarly manipulated⁹
- the Subject met with the professor on July 27, 2009 and admitted to manipulation of the SEM images when confronted with the original data
- the Subject immediately left the professor's research lab, and left the university graduate school shortly thereafter

The university investigation concluded that the altered SEM images¹⁰ were not used in any research, presentation, publication, or proposal.¹¹ The university investigation did not uncover any other instances of alleged research misconduct by the Subject.

¹ The university assessment is set out in a letter; the letter and related documents are included at Tab 1, and the letter is referred to herein as the university report. The university initially handled the matter as an academic dishonesty investigation. The university report by the Academic Dishonesty Committee was reviewed by the university Office of Research Integrity (ORI). ORI did not convene a separate investigation committee or prepare a separate report. The ORI Director interviewed relevant individuals to confirm the facts of the case. ORI actions are described on pages 1-6 of the cover letter at Tab 1.

² [REDACTED]
³ [REDACTED]
[REDACTED]
[REDACTED]

⁴ University report, page 19 (Tab 1).

⁵ According to the charge summary in the university report, the first manipulated SEM image was provided to [REDACTED] another graduate student involved in the same research (page 13). However, the email from the Subject for this date shows that the image was sent to [REDACTED] (pages 4 and 19).

⁶ University report, page 13. For instance, the time and date stamp on the original and manipulated image are identical. See Figure 1a and 1b on page 15 of the report.

⁷ [REDACTED]
⁸ [REDACTED]

⁹ University report, page 13 and Figure 2a and 2b (page 16). The time and date stamps are again identical. The university report states that the image was provided to the Subject on July 21, 2009 (page 13), but the date on the email from the Subject is July 20, 2009 (page 20).

¹⁰ The SEM images were to "produce features in the micrometer scale that were apart about 50 nm from neighboring elements." (University report, page 4, (Tab 1)).

The Subject did not provide information to the ADC committee, or comments on the report. University officials dismissed the Subject from the university in September 2009 with a notation on his transcript for academic dishonesty.

OIG's Investigation

We initiated an investigation after receiving the university's report. We contacted the Subject multiple times to invite his comments on the university report and actions, but received no response. We established that the Subject departed the United States in September 2009, and we concluded that the Subject returned to a Canadian university where he had been previously enrolled.¹²

We determined that the University investigation was complete and followed reasonable procedures.¹³ The investigation identified that time stamps on the data files and background noise in images obtained directly from instrument files are identical with those in manipulated images presented by the Subject to his colleagues, thereby establishing the source of the images.¹⁴ The investigation collected emails that accompanied that transmittal of the manipulated images by the Subject to his colleagues, and interviewed the Subject's research colleagues.¹⁵

OIG's Assessment

A finding of research misconduct by NSF requires that 1) there be a significant departure from accepted practices of the relevant research community, that 2) the research misconduct be committed intentionally, or knowingly, or recklessly, and that 3) the allegation be proved by a preponderance of the evidence.¹⁶

¹¹ The report states that the images were acquired as part of research work supported by [REDACTED]

¹² The Subject worked with [REDACTED] from approximately September 2007 through September 2008, at which time the Subject enrolled at [REDACTED]. The conclusion that he has returned to [REDACTED]

[REDACTED]). We used the listed email address to further attempt to contact the Subject.

¹³ See n.1 above. The university's written procedures state that allegations of research misconduct are to be handled solely by ORI, and the university initially dealt with the matter as alleged academic dishonesty. However, the ORI Director subsequently conducted an overview of the initial investigation, and in our view the overall process was fair to the Subject and resulted in a thorough collection and fair assessment of the evidence.

¹⁴ The emails from the Subject conveying the images are reproduced on pages 19 and 20 of the university report (Tab 1).

¹⁵ A summary of the interviews is on pages 4 and 5 of the university report (Tab 1).

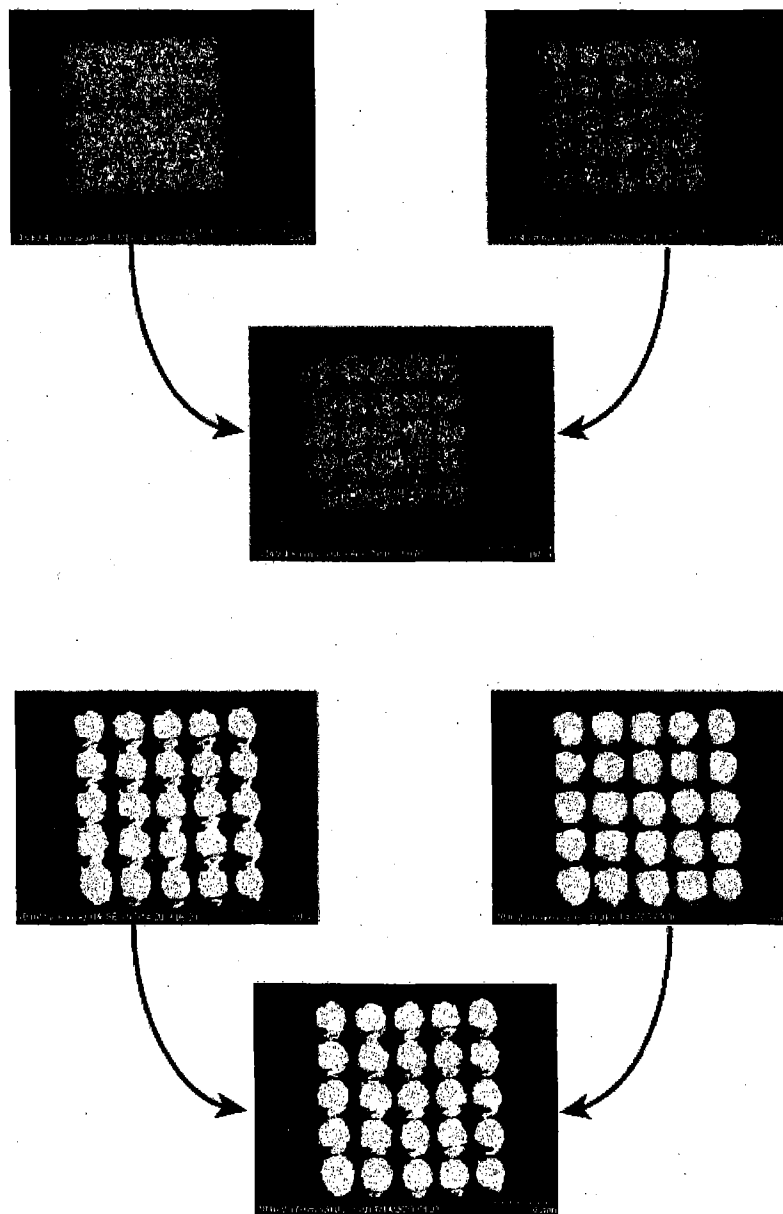
¹⁶ 45 C.F.R. § 689.2(c).

SENSITIVE

SENSITIVE

The Act

The Subject manipulated SEM images to create features with the desired properties. Visual comparison of the original and manipulated images shows that dark pixels in the manipulated images artificially delineated the circular edges of the structures, as shown in the Figure.



In this Figure, the original images on the left are contrasted with the altered images on the right. The green and magenta areas on the central overlapped images highlight the portions of the images that were manipulated. The concordance in the background noise in the images is evident.

SEM images are often processed by software (see ncsa.illinois.edu/~kindr/phd/PART1.PDF). These processing techniques include contrast enhancement, grey level histogram modification, and noise reduction methods. Community standards require that processing be accompanied by a written description (see, e.g., ammrf.org.au/myscope/sem/practice/principles/perfecting/). The manipulation of the SEM image to create artificially sharp edges is a significant departure from the community standards of image processing, and constitutes fabrication.

State of Mind

We conclude that the Subject's intent in his admitted manipulation of the images was knowing. The Subject retrieved the original image file, opened the file with a program such as Photoshop, changed the image through editing such as duplicate, copy and paste, and sharpen tools, saved the manipulated image, and emailed it to his colleague with a different file name from the original data. These actions support a knowing level of intent.

Burden of Proof

We conclude that a preponderance of the evidence shows that the Subject knowingly fabricated the images in a significant departure from the standards of the relevant research community, and that the Subject therefore committed research misconduct.

OIG's Recommended Disposition

When deciding what appropriate action to take upon a finding of misconduct, NSF must consider: (1) how serious the misconduct was; (2) the degree to which the misconduct was knowing, intentional, or reckless; (3) whether it was an isolated event or part of a pattern; (4) whether it had a significant impact on the research record, research subjects, other researchers, institutions or the public welfare; and (5) other relevant circumstances.¹⁷

Seriousness

The Subject fabricated SEM images, presented them as results of his research to evidence his mastery of the experimental procedures. Left undiscovered, this misrepresentation of his abilities would undermine the integrity of his future research.

Pattern

The Subject fabricated two SEM images over two weeks. There is no evidence for other instances of research misconduct in the year that he was enrolled at the university.

¹⁷ 45 C.F.R. § 689.3(b).

Impact on the Research Record

The Subject's fabrication of the images had no subsequent scientific impact, as it was immediately discovered, and the images were not included in any report, presentation, or publication.

We contacted the Subject at his current email address to secure an address to which we could send a draft copy of this report of investigation for his comments. We received no reply.

Recommendations

We recommend that NSF:

- Send the Subject a letter of reprimand notifying him that NSF has made a finding of research misconduct.¹⁸
- Debar the Subject for 1 year.¹⁹
- Require the Subject to certify to the Assistant Inspector General for Investigations (AIGI) his completion of a responsible conduct of research training program and provide documentation of the program's content within 1 year of NSF's finding.²⁰ The instruction should be in an interactive format (e.g., an instructor-led course).

For a period of 2 years as of the date of NSF's finding:

- Require for each document (proposal, report, etc.) to which the Subject contributes for submission to NSF (directly or through her institution),
 - the Subject to submit a certification to the AIGI that the document does not contain plagiarism, falsification, or fabrication;²¹ and
 - the Subject to submit assurances from a responsible official of her employer to the AIGI that the document does not contain plagiarism, falsification, or fabrication.²²
- Bar the Subject from participating as a peer reviewer, advisor, or consultant for NSF.²³

¹⁸ A Group I action 45 C.F.R. 689.3(a)(1)(i).

¹⁹ A Group III action 45 C.F.R. 689.3(a)(3)(iii).

²⁰ This action is similar to Group I actions 45 C.F.R. 689.3(a)(1).

²¹ This action is similar to 45 C.F.R. 689.3(a)(1)(iii).

²² A Group I action 45 C.F.R. 689.3(a)(1)(iii).

²³ A Group III action 45 C.F.R. 689.3(a)(3)(ii).

NATIONAL SCIENCE FOUNDATION
4201 WILSON BOULEVARD
ARLINGTON, VIRGINIA 22230



OFFICE OF THE
DIRECTOR

CERTIFIED MAIL --RETURN RECEIPT REQUESTED

[REDACTED]

***Re: Notice of Proposed Debarment and Notice of Research Misconduct
Determination***

Dear [REDACTED]

While a graduate student at [REDACTED] conducting research funded by the National Science Foundation ("NSF"), you fabricated scanning electron microscope (SEM) images in connection with this research. The details of said fabrication are set forth in the attached report of the NSF Office of the Inspector General ("OIG").

In light of your misconduct, this letter serves as formal notice that the NSF is proposing to debar you from directly or indirectly obtaining the benefits of Federal grants for a period of one year. During your period of debarment, you will be precluded from receiving Federal financial and non-financial assistance and benefits under non-procurement Federal programs and activities. In addition, you will be prohibited from receiving any Federal contracts or approved subcontracts under the Federal Acquisition Regulations ("FAR"). Lastly, during your debarment period, you will be barred from having supervisory responsibility, primary management, substantive control over, or critical influence on, a grant, contract, or cooperative agreement with any agency of the Executive Branch of the Federal Government.

In addition to proposing your debarment, I am requiring that you submit certifications, and that a responsible official of your employer submit assurances, that any proposals or reports that you submit to NSF do not contain plagiarized, falsified, or fabricated material. This requirement will be in effect for two years from the expiration of your debarment period.

Research Misconduct and Sanctions other than Debarment

Under NSF's regulations, "research misconduct" is defined as "fabrication, falsification, or plagiarism in proposing or performing research funded by NSF ..." 45 CFR 689.1(a). Fabrication is defined as "making up data or results and recording or reporting them." 45 CFR 689.1(a)(1). A finding of research misconduct requires that:

- (1) There be a significant departure from accepted practices of the relevant research community; and
- (2) The research misconduct be committed intentionally, or knowingly, or recklessly; and
- (3) The allegation be proven by a preponderance of evidence.

45 CFR 689.2(c).

As the OIG's report demonstrates, you improperly manipulated two SEM images and presented the images to members of your research group. Your manipulation of these images and reporting them to your colleagues unquestionably constitutes fabrication. I therefore conclude that your actions meet the applicable definition of "research misconduct" set forth in NSF's regulations.

Pursuant to NSF's regulations, the Foundation must also determine whether to make a *finding* of misconduct based on a preponderance of the evidence. 45 CFR 689.2(c). After reviewing the Investigative Report, NSF has determined that, based on a preponderance of the evidence, your fabrications were committed intentionally and constituted a significant departure from accepted practices of the relevant research community. I am, therefore, issuing a finding of research misconduct against you.

NSF's regulations establish three categories of actions (Group I, II, and III) that can be taken in response to a finding of misconduct. 45 CFR 689.3(a). Group I actions include issuing a letter of reprimand; conditioning awards on prior approval of particular activities from NSF; requiring that an institution or individual obtain special prior approval of particular activities from NSF; and requiring that an institutional representative certify as to the accuracy of reports or certifications of compliance with particular requirements. 45 CFR 689.3(a)(1). Group II actions include award suspension or restrictions on designated activities or expenditures; requiring special reviews of requests for funding; and requiring correction to the research record. 45 CFR 689.3(a)(2). Group III actions include suspension or termination of awards; prohibitions on participation as NSF reviewers, advisors or consultants; and debarment or suspension from participation in NSF programs. 45 CFR 689.3(a)(3).

In determining the severity of the sanction to impose for research misconduct, I have considered the seriousness of the misconduct; the fact that it was committed intentionally; the fact that the misconduct had no effect on the research record; and the fact that, while occurring over two weeks, there was no pattern of other fabrication misconduct. I have also considered other

relevant circumstances. 45 CFR 689.3(b).

I, therefore, take the following actions:

- For two years after the expiration of your debarment period, you are required to submit certifications that any proposals or reports you submit to NSF do not contain plagiarized, falsified, or fabricated material;
- For two years after the expiration of your debarment period, you are required to submit assurances from a responsible official of your employer that any proposals or reports you submit to NSF do not contain plagiarized, falsified, or fabricated material;
- For two years from the date of this letter, you are prohibited from serving as an NSF reviewer, advisor, or consultant; and
- You are required to complete a comprehensive responsible conduct of research training course within one year from the date of this letter and provide documentation of the program's content. The instruction should be in an interactive format (e.g., instructor led course, workshop, etc) and should include a discussion of data fabrication.

All certifications and assurances should be submitted in writing to NSF's Office of Inspector General, Associate Inspector General for Investigations, 4201 Wilson Boulevard, Arlington, Virginia, 22230.

Debarment

Regulatory Basis for Debarment

Pursuant to 2 CFR 180.800, debarment may be imposed for:

- (b) Violation of the terms of a public agreement or transaction so serious as to affect the integrity of an agency program, such as –
 - (1) A willful failure to perform in accordance with the terms of one or more public agreements or transactions; or
 - ...
 - (3) A willful violation of a statutory or regulatory provision or requirement applicable to a public agreement or transaction; or
 - ...
- (d) Any other cause of so serious or compelling a nature that it affects your present responsibility.

In any debarment action, the government must establish the cause for debarment by a preponderance of the evidence. 2 CFR 180.850. In this case, you knowingly and willfully fabricated research data, undermining the public integrity of funded research, and violating the terms of NSF support. Thus, your actions support a cause for debarment under 2 CFR 180.800(b) and (d).

Length of Debarment

Debarment must be for a period commensurate with the seriousness of the causes upon which an individual's debarment is based. 2 CFR 180.865. Generally, a period of debarment should not exceed three years but, where circumstances warrant, a longer period may be imposed. 2 CFR 180.865. Having considered the seriousness of your actions, as well as the relevant aggravating and mitigating factors set forth in 2 CFR 180.860, we are proposing your debarment for one year.

Appeal Procedures for Finding of Research Misconduct and Procedures Governing Proposed Debarment

Appeal Procedures for Finding of Research Misconduct

Under NSF's regulations, you have 30 days after receipt of this letter to submit an appeal of this finding, in writing, to the Director of the Foundation. 45 CFR 689.10(a). Any appeal should be addressed to the Director at the National Science Foundation, 4201 Wilson Boulevard, Arlington, Virginia 22230. If we do not receive your appeal within the 30-day period, the decision on the finding of research misconduct will become final. For your information, we are attaching a copy of the applicable regulations.

Procedures Governing Proposed Debarment

The provisions of 2 CFR Sections 180.800 through 180.885 govern debarment procedures and decision-making. Under these regulations, you have 30 days after receipt of this notice to submit, in person or in writing, or through a representative, information and argument in opposition to this debarment. 2 CFR 180.820. Comments submitted within the 30-day period will receive full consideration and may lead to a revision of the recommended disposition. If NSF does not receive a response to this notice within the 30-day period, this debarment will become final.

Any response should be addressed to Lawrence Rudolph, General Counsel, National Science Foundation, Office of the General Counsel, 4201 Wilson Boulevard, Room 1265, Arlington, Virginia 22230.

For your information, we are attaching a copy of the Foundation's regulations on non-procurement debarment and FAR Subpart 9.4. Should you have any questions about the foregoing, please contact Peggy Hoyle, Deputy General Counsel, at (703) 292-8060.

Sincerely,

A handwritten signature in cursive script, appearing to read "Fae Korsmo".

Fae Korsmo
Senior Advisor to the Director

Enclosures:
Investigative Report
Nonprocurement Debarment Regulations
FAR Regulations
45 CFR Part 689

NATIONAL SCIENCE FOUNDATION
4201 WILSON BOULEVARD
ARLINGTON, VIRGINIA 22230



OFFICE OF THE
DEPUTY DIRECTOR

CERTIFIED MAIL -RETURN RECEIPT REQUESTED

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Re: Notice of Debarment

Dear [REDACTED]

On [REDACTED], the National Science Foundation ("NSF") issued you a Notice of Proposed Debarment ("Notice") in which NSF proposed to debar you from directly or indirectly obtaining the benefits of Federal grants for a period of one year. As reflected in the Notice, NSF proposed to debar you because you fabricated data while performing NSF-funded research. In that Notice, NSF provided you with thirty days to respond to the proposed debarment.

The period for submitting a response to NSF has elapsed, and NSF has not received a response from you. Accordingly, you are debarred until [REDACTED] 2015.

Debarment precludes you from receiving Federal financial and non-financial assistance and benefits under non-procurement Federal programs and activities unless an agency head or authorized designee makes a determination to grant an exception in accordance with 2 CFR 180.135. Non-procurement transactions include grants, cooperative agreements, scholarships, fellowships, contracts of assistance, loans, loan guarantees, subsidies, insurance, payments for specified use, and donation agreements.

In addition, you are prohibited from receiving Federal contracts or approved subcontracts under the Federal Acquisition Regulations at 48 CFR subpart 9.4 for the period of this debarment. 2 CFR 180.925. During the debarment period, you may not have supervisory responsibility, primary management, substantive control over, or critical influence on, a grant, contract, or cooperative agreement with any agency of the Executive Branch of the Federal Government.

Please note that, in the Notice, NSF also took the following actions against you, which continue to remain in effect:

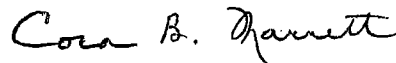
- For two years from the end of your debarment period, you are required to submit

certifications that any proposals or reports you submit to NSF do not contain plagiarized, falsified, or fabricated material;

- For two years from the end of your debarment period, you are required to submit assurances by a responsible official of your employer that any proposals or reports you submit to NSF do not contain plagiarized, falsified, or fabricated material;
- You are prohibited from serving as an NSF reviewer, advisor, or consultant through [REDACTED] 2016; and
- You are required to complete a comprehensive responsible conduct of research training course by [REDACTED], 2015 and provide documentation of the program's content. The instruction should be in an interactive format (e.g., instructor led course, workshop, etc.) and should include a discussion of data fabrication.

Should you have any questions about the foregoing, please contact [REDACTED], Assistant General Counsel, at (703) 292-[REDACTED].

Sincerely,



Cora B. Marrett
Deputy Director