Closeout for M95080034

In August 1995, the university[1] where the subject[2] was a postdoctoral researcher[3] informed OIG that it had finished an inquiry and was proceeding with an investigation into an allegation of data falsification against the subject. The subject had sent his sample to a company[4] for analysis and received a faxed analysis of the results. The results apparently did not agree with the subject's expected theoretical calculations as well as he had hoped, and the subject falsified the results presented in the report to better agree with his predictions. The falsified report was discovered, and the University began an inquiry.

OIG's investigation report and NSF's Deputy Director's letter reflecting his decision constitute the closeout for this case.

cc: Investigations, Legal, AIG-Oversight, IG

[1] (footnote redacted).
[2] (footnote redacted).
[3] (footnote redacted).
[4] (footnote redacted).

NATIONAL SCIENCE FOUNDATIO
4201 WILSON BOULEVARD
ARLINGTON, VIRGINIA 22230

OFFICE OF THE
DEPUTY DIRECTOR

April 2, 1998

Via Federal Express

Re: Notice of Misconduct in Science Determination

Dear Dr.

The National Science Foundation's Office of Inspector General (OIG) issued an Investigative Report on October 6, 1997 in which it found that you falsified data in an elemental analysis report in connection with NSF-supported scientific research. A copy of the investigative report is enclosed.

Misconduct in Science and Proposed Sanctions

The Foundation's administrative record indicates that you were formerly a postdoctoral researcher in the Department at (the University). While at the University, you worked with Dr. , the Principal Investigator (PI) on an NSF grant (NSF Grant entitled . The research involved synthesis of new chemical compounds. You falsified the quantities of carbon and hydrogen presented in the elemental analysis report prepared by to support a new method you were promoting to synthesize new chemical compounds. The falsified data appeared in a draft manuscript.

The OIG provided you with an opportunity to comment on its draft investigative report. In your letters dated August 23, 1997 and September 26, 1997, you admit that you purposely altered the data. Because you were concerned that the PI would preclude you from completing your research if he learned of the actual test results, you altered the results in case he asked to see them. You indicated that you did not have much time left to complete your research before your departure from the University and that you were trying to ensure your right of authorship in upcoming publications.

Under NSF's misconduct in science and engineering regulations, "misconduct" is defined to include "fabrication, falsification, plagiarism, or other serious deviation from accepted practices in

proposing, carrying out or reporting results from activities funded by NSF . . ." 45 CFR §689.1(a). You falsified data and your falsification was a serious deviation from accepted practices within the scientific community. I therefore conclude that you committed misconduct in science.

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 §689.2(a). Group I actions, the least severe of the sanctions, include letters of reprimand and requiring certifications or assurances of accuracy or compliance with particular requirements. 45 CFR §689.2(a)(1).

In deciding what response is appropriate when misconduct is found, NSF must consider the seriousness of the misconduct; whether it was deliberate or careless; whether it was an isolated event or part of a pattern; and whether the misconduct affects only certain funding requests or has implications for any application for funding involving the subject of the misconduct finding. 45 CFR §689.2(b).

The administrative record indicates that you purposely falsified data. You carefully forged the report so that it would appear unaltered in order to deceive the PI. You altered the carbon and hydrogen results in the report to bring them closer to your theoretical prediction and prove that you had synthesized the target compound.

Falsification of data is a serious offense because it distorts the scientific record. The scientific record is the foundation for all future research. Both the Federal Government and the scientific community have a vital interest in protecting the integrity of the research process.

In your defense, you claim that you never took any active steps to communicate the falsified data to the PI. Rather, you state that it was , who also worked on the project, who unknowingly took the altered data from the file and incorporated it into a report being prepared for the PI. Of far greater significance, however, is the fact that you deliberately altered the data and that you did so for the purpose of misleading the PI if he inquired about the test results. However, the severity of the misconduct is mitigated by the fact that there is no evidence in the record that you have engaged in falsification on other occasions.

Based on the above facts, I will require that if you submit any proposals or reports to NSF or report on the results of any NSF-supported research within three years of the date of this letter, you must submit a separate written certification to NSF's OIG. The written certification shall state that to the best of your knowledge, the documents contain neither false data nor hypotheses or conclusions based upon falsified data. The certification should be sent to the Assistant Inspector General

for Oversight, 4201 Wilson Boulevard, Arlington, Virginia, 22230, at the same time that you submit the proposal or report to NSF or report the results of the NSF-funded research. In addition, your Dean or supervisor on the project must also submit an assurance to the OIG that to the best of his or her knowledge, your proposal or report submitted to NSF, or report of results from NSF-funded research does not contain falsified data and presents neither hypotheses nor conclusions based upon falsified data.

Procedures Governing Appeals

Under our regulations, you have 30 days after receipt of this letter to appeal in writing, to the Director of the Foundation. 45 CFR §689.9(a). Any appeal should be addressed to the Director of the National Science Foundation, 4201 Wilson Boulevard, Arlington, Virginia 22230. For your information, I am attaching a copy of the applicable regulations. If you have any questions about the foregoing, please call Lawrence Rudolph, General Counsel, at (703) 306-1060.

Sincerely,

Joseph Bordogna

Joseph Bordogna
Acting Deputy Director

Enclosures (2)
Investigative Report
Misconduct in Science Regulations

CONFIDENTIAL

NSF OIG INVESTIGATION REPORT

October 6, 1997

OIG Case Number M95080034

REPORT OF INVESTIGATION INTO AN ALLEGATION OF MISCONDUCT IN SCIENCE

SUMMARY

The Office of Inspector General (OIG) has concluded that the subject,[1] formerly a postdoctoral researcher at the University,[2] falsified data in an elemental analysis report (the report) while being supported by the PI's NSF grant.[3] This conclusion is based on the subject's own statements, and the inquiry and investigation performed by the institution. The uncontested evidence establishes that the subject purposefully falsified data in the report as support for a new method he was promoting to synthesize new chemical compounds. The subject admitted on several occasions to falsifying the data, and explained his motive at length in writing. In addition, a preponderance of the evidence establishes that the subject discussed the compound, the analysis of which he falsified, in a group meeting, and bore responsibility for the appearance of the falsified data in a draft research report that was being prepared for publication.

OIG recommends that NSF find that the subject committed misconduct in science and take the following actions as a final disposition in this case. First, a letter of reprimand from NSF's Deputy Director should be sent to the subject informing him that NSF has made a finding of misconduct in science against him. Second, he should be required, for a period of 3 years from the final disposition of this case, to submit, in connection with any NSF-supported publication or submission to NSF, a certification to OIG that to the best of his knowledge, his documents contain no false data, and no hypotheses or conclusions based upon falsified data. Third, the subject should be required to ensure that his Dean, or appropriate supervisory official, provides an assurance that, to the best of his or her knowledge, the subject's work associated with any NSF-supported publication or submission to NSF does not contain falsified data and presents neither hypotheses nor conclusions based upon falsified data.

BACKGROUND

The subject, and his wife, were postdoctoral researchers at the University working with the PI. The subject was supported through the PI's NSF grant. The subject was working with the PI on research to synthesize new chemical compounds. The subject sent a new compound to the company[4] for elemental

[1] (footnote redacted).
[2] (footnote redacted).
[3] (footnote redacted).
[4] (footnote redacted).

analysis of carbon and hydrogen. He received a faxed analysis of the results (Exhibit 1) on April 21, 1995. The analysis reported the elemental composition of carbon and hydrogen in the compound. The results apparently did not agree with the subject's expected theoretical calculations as well as he had hoped, and the subject allegedly falsified the percent of both carbon and hydrogen presented in the report (Exhibit 2) to better agree with his predictions. The falsified report was discovered and the University began an inquiry.

In August 1995, the University informed us that it had concluded that there was sufficient substance to the allegation that the subject falsified data in the report, and that it would proceed with an investigation. The University presented us with its inquiry report (Exhibit 3) and its misconduct regulations (the *Interim Research Misconduct Policy*).

Consistent with NSF's position that "awardee institutions bear primary responsibility for prevention and detection of misconduct" (45 C.F.R. § 689.3 (a)), we deferred our inquiry and any investigation until the efforts at the institution were concluded.

In November 1995, the University provided us with a copy of its investigation report (Exhibit 4) and supplementary documents. We reviewed the University's report and concluded that it had satisfactorily and fairly addressed the allegation, and that the subject had an opportunity to respond to the allegation before any action was taken by the University.

The investigation Committee reviewed the PI's logbook, the allegedly falsified and the authentic analysis reports, the draft manuscript of a research report being prepared for publication, and material presented by the subject in his defense. It also interviewed the PI. The Committee concluded the subject's falsification of the data in the report constituted misconduct in science.

UNIVERSITY'S INVESTIGATION

Following its inquiry, and the subject's response to the inquiry, the University convened a five-member investigation Committee with expertise in biology, meteorology, chemistry, and material science and engineering to investigate the allegation against the subject. The investigation Committee members had experience submitting proposals to, and receiving support from, NSF, and thus, had experience in carrying out research under NSF awards.

History

The Committee's investigation report began with a historical presentation of events that led to the discovery of the falsified report. A faculty member in the PI's department found what looked like a tampered document (the report–Exhibit 2–was described as "a pretty good paste-up job"[5]) in the departmental photocopy machine and traced it back to the PI. The PI recognized it as an analysis report of a chemical compound that the subject was preparing and studying for the PI. The subject had had the report faxed to him from the company that performed the analysis. The subject also received the copy that the company mailed. The PI contacted the company that provided the analysis and asked for another copy of the analysis to be faxed directly to him (Exhibit 1). After comparing the report found in the photocopy machine with the analysis he received directly from the company, the PI noticed that the data in the two documents were different.[6] When the PI received a draft manuscript that contained the data from the report found in the photocopy machine, the PI followed the University's procedure for making an allegation of misconduct in science, and notified the Chair of his department. The Chair and the PI then arranged a meeting between them and the subject. During this meeting, the subject was confronted with the allegedly falsified report, and the subject admitted that he had falsified the data in the report (Exhibit 6, pg. 1). The Chair forwarded this information to the Vice President for Research (the VP) who began an inquiry. During a meeting with the inquiry Committee, "[the subject] fully admitted modifying the results from the [company]."[7] The subject was notified that the inquiry Committee concluded that there was enough evidence to justify an investigation into the allegation that he falsified data. The subject, who had returned to his home country,[8] responded to the inquiry report from there.

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[5] Transcript of the Interview with the PI, September 12, 1995, Exhibit 5, pg. 4.

[6] The subject's research was focused on increasing the number of carbon atoms in the compound he was synthesizing. Elemental analysis is one method used by chemists to confirm the composition of a compound. The company the subject submitted his sample to used an elemental analysis to experimentally measure the percentages of carbon and hydrogen by weight in the compound. The subject's theoretical prediction, i.e., his 'target' compound, has the formula [redacted], which is a compound with [redacted] silicon, and phosphorus atoms. Accordingly, a pure sample of this compound would be, by weight, 62.22% carbon and 5.30% hydrogen (see Exhibit 1). Although actual results always vary somewhat from the predicted values, a significant variation would be inconsistent with a conclusion that the submitted sample was a pure sample of a compound with the predicted chemical composition. The company's analysis of the sample submitted by the subject showed 59.04% carbon and 5.46% hydrogen by weight (see Exhibit 1), which is not consistent with the subject's target compound. This result would preclude a chemist from reporting the successful synthesis of the target compound. In contrast, the analysis set out on the altered report found in the photocopy machine, which showed 61.94% carbon and 5.36% hydrogen by weight (see Exhibit 2), would (if true) support the conclusion that the subject had synthesized his target compound.

[7] The University Inquiry Committee's Memorandum, Exhibit 3, pg. 2.

[8] (footnote redacted).

The subject's remarks on the inquiry report (Exhibit 7)

The subject explained his research history with the PI and the PI's research group. He said that he had developed an innovative methodology that was an important breakthrough in the field. The subject claimed that the PI would not let him publish any results deriving from his new methodology without further tests, and that the PI tried to slow the work down. The subject also claimed that the PI was planning to publish these results without the subject as a co-author and that this led to an argument between them. The subject said he "was afraid that [the PI] will prohibit me to go further"[9] without additional tests that would support the subject's new methodology. The subject stated that he was sure, based on the results of a different type of test from the one performed by the company, that he had created the 'target' compound.[10] The subject stated he "corrected" the analysis report he received from the company for his "personal files and not to publish them, [bold emphasis omitted][11] just in case [the PI] ask[ed] for them."[12]

Regarding the claim that he presented the data as real, the subject stated that

> "I have never presented or reported this faked value[13] to [the PI]. I have only prepared it to defence [*sic*] my professional interest and stored in my personal file with a [foreign language] comment 'not real', just in case [the PI] wants to stop my work because of an incorrect [elemental analysis] value."[14]

The subject wrote that while presenting a transparency during a staff meeting, he had discussed several compounds related to his methodology that "had been introduced together in a summarizing manner with the oral comment of 'completition [*sic*] is still in progress'" apparently implying that he had not presented the actual falsified values themselves.[15] Regarding the appearance of the allegedly falsified results in a draft manuscript, the subject claimed that his wife, who worked in the same research group of which he was in charge, removed the altered report from his desk to use in the manuscript she was preparing for publication. He included a handwritten statement from his wife with his response in which she said that she had removed the report from his desk without asking, or otherwise informing him.[16]

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[9] July 20, 1995, "Statement of [the subject] concerning the research misconduct investigation requested by [the PI]," Exhibit 7, pg. 2.

[10] Exhibit 7, pg. 1.

[11] Bold and underline emphases occur with high frequency in the various documents quoted in this report. To avoid a possible distraction to the reader, the emphases are omitted from all quotations in this report.

[12] Exhibit 7, pg. 2.

[13] Although the subject referred to "this faked value," it should read "these faked values" since there was more than one value that the subject admitted he had falsified.

[14] Exhibit 7, pg. 2.

[15] Exhibit 7, pg. 3.

[16] Exhibit 8.

Investigation Committee Report (Exhibit 4)

Findings

After evaluating the subject's response, the VP convened a committee to investigate the allegation. The investigation Committee concluded that

> "[t]he analysis report was altered by [the subject]. All of the evidence (including [the subject's] admission in his . . . letter) supports the conclusion that [the subject] altered the results of the [company] analysis performed on sample # . . . and faxed to [the subject] . . . . The correct analysis showed that the submitted sample was composed of 59.04% carbon and 5.46% hydrogen; [the subject] used careful forgery to alter this to 61.94% carbon and 5.36% hydrogen--closer to the theoretical prediction. After making a photocopy of the altered report, [the subject] apparently inadvertently left the original in the photocopier, where it was found by another member of the department and reported to [the PI]."[17]

The Committee found that "[t]he altered analysis [report] was presented as real."[18] The Committee stated that the PI "provided copies of his incident log and laboratory reports which indicate that the altered data were presented to him on several occasions."[19] The Committee noted

> "[the subject's] claims that his wife and co-worker . . . unknowingly incorporated that altered data from his files (where it was purportedly marked with the handwritten note 'not real' in [the subject's native language], a language [the subject's wife] reportedly does not read) into drafts of the reports that she was typing for submission to [the PI]. . . ."[20]

However the Committee did not find this explanation satisfactory.

> "After reviewing all of the evidence, the Committee concludes that, whatever his degree of direct responsibility for typing the incorrect data into the reports, as the author of the fabricated data [the subject] is ultimately responsible for the fact that the altered results were presented to [the PI] and other coauthors in preliminary drafts of research papers. The Committee believes that had the alteration not been discovered, the altered data would very likely have been included in a published report on this research."[21]

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[17] From the University Investigation Committee's Memorandum to the Vice President for Research, Exhibit 4, pg. 2.

[18] *Ibid.*

[19] Exhibit 4, pp. 2-3.

[20] Exhibit 4, pg. 3.

[21] *Ibid.*

(Note that the Committee referred to reports and drafts. The subject disputed the existence of more than one document.)

The Committee found that "[t]he alteration of data damaged [the PI's] research."[22] Examples of the damage the Committee cited were the PI's claims that the "effort required to replicate and/or confirm data produced by [the subject] has resulted in delay of submission of a competitive renewal on one of [the PI's] grants" and that the "turmoil produced by the discovery of data alteration has also damaged morale among other researchers in the group."[23] With regard to the PI's and other researchers' efforts to verify the subject's other results, the Committee concluded "[t]here is no evidence of other research misconduct by [the subject]."[24]

The Committee's Evaluation of Intent

The University's misconduct regulation includes falsification in its definition of research misconduct.[25] The Committee stated "[t]he standard definition of falsification includes 'to alter a document in order to deceive'." It concluded, without further explanation, that "falsification requires both alteration of a record and use of the altered record with intent to deceive."[26]

The Committee stated that "[t]he fact that [the subject] forged a convincing alteration of the microanalysis report is clearly documented and not contested."[27] Regarding the subject's intent, the Committee found

> "[the subject's] creation and retention of a careful forgery creates a strong presumption of his intent to deceive and eliminates the possibility of 'honest error' in this case. After considering that the altered data were presented to colleagues in reports and drafts of research papers for nearly a month after the forgery occurred, the Committee concluded that [the subject] intended to deceive his colleagues and allow the altered data to pass into manuscripts submitted for publication."[28]

Thus, the Committee concluded that the subject had satisfied both of its criteria for falsification.

Regarding the subject's probable motive,

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[22] *Ibid.*

[23] *Ibid.*

[24] *Ibid.*

[25] "'Misconduct' or 'Misconduct in Research' means fabrication, falsification, plagiarism, or other practices that seriously deviate from those practices that are commonly accepted within the research community for proposing, conducting, or reporting research," as defined in The University's *Interim Research Misconduct Policy*, section IV. D., pg. 2.

[26] Exhibit 4, pg. 4.

[27] *Ibid.*

[28] *Ibid.*

> "[t]he Committee concluded that the most likely reason for the data alteration was to save [the subject] the time and effort of preparing purer samples of the compound in question. [The subject] claims that the alteration was done under great pressure from [the PI] to complete manuscripts before the [subject and his wife] returned to [his homeland]. [The PI] denies that he set any deadlines for completion of the papers . . . ."[29]

Conclusion

The Committee determined that the subject "falsified research results and engaged in research misconduct as defined in the University's Interim Research Misconduct Policy."[30]

> "The Committee view[ed] the falsification of data as a violation of the University's policy prohibiting research misconduct, as well as a serious breach of research ethics, and believe[d] that virtually all professional scientists worldwide would recognize what [the subject] did as improper."[31]

Although the Committee found the subject's actions were harmful to the PI's research, it also realized that

> "[b]ecause the alteration of data was discovered so soon after it occurred, however, the consequences of [the subject's] actions have been relatively minor. In view of the fact that [the subject] is no longer an employee of [the University] and is working outside the United States, possible sanctions for his misconduct are quite limited."[32]

The Committee recommended that (a) the subject "be permanently barred from teaching, presenting lectures or carrying out research at the University," and (b) the VP "notify appropriate authorities of [the subject's] misconduct so that they can monitor 1) his future research conduct, and 2) his involvement in research activities sponsored by U.S. government agencies."[33]

The subject's remarks on the Committee's report and recommended sanctions (Exhibit 9)

The subject addressed many of the issues raised by the Committee, beginning with the finding that the altered data were presented as real. He reiterated from

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[29] Exhibit 4, pg. 3.
[30] *Ibid.*
[31] Exhibit 4, pg. 4.
[32] *Ibid.*
[33] *Ibid.*

his response to the inquiry report that he "never presented the questioned values of the elemental analysis to [the PI] or to any other coworker in the group."[34] He restated that, during the oral presentation, he said he was "still working on the completion of the full characterization" of the compound that resulted from his new methodology.[35] He questioned the accuracy of the PI's incident log and laboratory notebook, and disputed the PI's statement "'that the altered data were presented to him on several occasions . . . .'"[36] The subject said that the Committee's statement that "altered results were presented to [the PI] and other coauthors in preliminary drafts of research papers" required clarification.[37] The subject said the original manuscript listed only the subject, the subject's wife, and the PI as authors. The subject wrote that only after it was determined that the project would not be completed before the subject left the country, did the PI add two different researchers as co-authors, bringing the total number of authors to five. The subject also objected to the PI's claim that more than one manuscript contained the falsified data. He said that there was only a "first completed draft of one manuscript of only one research paper."[38] He explained that his wife removed the report, incorporated it into this draft, and gave it to the PI without the subject's knowledge. Furthermore, the subject said he never saw the manuscript, because the next day, the Chair and the PI organized a meeting to discuss the allegedly falsified report with the subject.[39]

The subject strongly objected to the Committee's assessment of the damage his altered report had on the PI's research.[40] The subject also disagreed with the Committee's assessment of his intent to deceive. Again, considering the Committee's statement "'that the altered data were presented to colleagues in reports and drafts of research papers,'" the subject wrote that that statement was not accurate because there was only "one draft of the experimental part of one manuscript of one research paper." [41]

UNIVERSITY'S ACTIONS

The VP wrote the subject, notifying him of the finding and that he had accepted the recommended sanctions, namely, that (a) the subject "be permanently barred from teaching, presenting lectures or carrying out research at" the University, and

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[34] The subject's October 24, 1995, response to the VP on the Investigation Committee Memorandum, Exhibit 9, pg. 2.

[35] *Ibid.*

[36] *Ibid.*

[37] Exhibit 9, pg. 2.

[38] Exhibit 9, pg. 3.

[39] Exhibit 9, pp. 2,3,5.

[40] Exhibit 9, pg. 3.

[41] Exhibit 9, pg. 5.

(b) that the VP "notify appropriate authorities."[42] The VP wrote that he had accepted both of the Committee's recommendations and that the subject could not hold any teaching or research position at the University, "whether or not that involves a formal appointment."[43] The VP also told the subject that NSF would be informed of the VP's actions.

The VP told the Chair of the Department to ensure that the subject was banned from "teaching, presenting lectures, or carrying out research at the University . . . ."[44]

OIG'S REVIEW OF THE UNIVERSITY'S INVESTIGATION REPORT

NSF's misconduct in science and engineering regulation states that "after receiving a report from an external investigation by an awardee institution . . . OIG will assess the accuracy and completeness of the report and whether the investigating entity followed usual and reasonable procedures. It will either recommend adoption of the findings in whole or in part or . . . initiate a new investigation." (45 C.F.R. § 689.8 (a)).

We concluded that the materials submitted by the University constituted a satisfactory investigation into the allegation and that, despite the Committee not specifying a standard of proof[45] or level of intent, we could utilize the evidence presented in the University's investigation report for our purposes. Additional investigation by our office was not required.

OIG'S ANALYSIS REGARDING MISCONDUCT IN SCIENCE

NSF defines misconduct in science, in part, as "[f]abrication, falsification, plagiarism, or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF" (45 CFR § 689.1(a)(1)). A finding of misconduct in science against a subject requires that the subject both committed a bad act and did so with a level of culpable intent that justifies taking action against the subject. NSF's standard of proof in evaluating the evidence is a preponderance of the evidence, and, in order to make a finding of misconduct, NSF expects that the subject must have acted, minimally, with gross negligence.

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[42] Exhibit 11.

[43] November 17, 1995, letter from the VP to the subject, Exhibit 11.

[44] November 17, 1995, letter from the VP to the Chair of the PI's department, Exhibit 12.

[45] Although the Committee did not specify which standard of proof they used to evaluate the evidence used in their conclusion, the VP assessed it as "clear and convincing evidence . . . ." See Exhibit 12.

Motive

The Committee "concluded that the most likely reason for the data alteration was to save [the subject] the time and effort of preparing purer samples of the compound in question."[46] The subject essentially agreed in his response, stating "[a]t this stage, I wanted to save time to proceed [with] the chemistry . . . and not to get st[u]ck on this step . . . ."[47] The subject was apparently working under pressure to complete his results. The subject and the PI disagreed about the pace of the subject's research. The subject had only a few months to complete his research before he returned to his home country where he had a job waiting for him. The subject believed the PI wanted to slow down the subject's research by requiring complete analysis of the compound before moving forward to the research the subject was more interested in performing. (The subject noted "[the PI's] strategy is having the full characterization of a new compound before making further progress in the chemistry."[48] See also Exhibit 5, pp. 2-3 for the PI's statements on the importance of this analysis.)

The subject was also motivated by trying to secure his authorship rights on the manuscript. In his response to the University Investigation Report, the subject wrote:

> "that the members of the committee did not consider the conflict between [the PI] and me about authorship rights . . . which deeply influenced my working strategy under great pressure until my departure to [the Continent on which his homeland is located] and actually is the ultimate motive for my action."[49]

In fact, the subject presented his own "Summary of [his] Motive." The subject wanted to "[p]rogress the chemistry as fare [*sic*] as possible by myself to secure my right of authorship, which was questioned by [the PI] resulting in a big argue [*sic*] already . . . on another issue."[50] The PI described a discussion he had with subject about proper inclusion of researchers as co-authors on publications resulting from team projects (See Exhibit 5, pg. 6.). We believe the subject adequately expressed his motive for falsifying the data—his fear of not being a co-author on publications, and the time constraint due to his imminent departure.

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[46] Exhibit 4, pg. 3.
[47] Exhibit 9, pg. 5.
[48] Exhibit 7, pg. 1.
[49] Exhibit 9, pp. 3-4.
[50] Exhibit 9, pg. 5.

The Act

It is uncontested that the subject falsified data in the report he alone received. His action was made more serious by circumstances that will be described later in this report.

Intent

We believe the evidence demonstrates that the subject acted culpably when he knowingly created a false document with the admitted intention of using it to deceive the PI. We therefore conclude the subject acted purposefully.

Evidence that the act was at least knowing includes that the subject was the sole recipient of the company's fax of the original report of the analysis of the material and noticed the results were not what he had expected. The subject also received the mailed hard copy of the original report and did not share it with the PI. The subject carefully cut and pasted the original report's data, including matching the font style and size of the original report, so this would appear unaltered and closer to his theoretical values.

We believe, however, that the subject acted purposefully. If the subject had not intended to use the falsified report as authentic, he would have merely crossed out the real data and penciled in his "corrected" values. This is especially compelling since the subject "indicated [to the inquiry Committee] that in his judgement [*sic*] all the data pertaining to this compound . . . were correct and this was the right compound even though he was unable to obtain a correct experimental microanalysis."[51]

The subject admitted that he altered the company's original report "just in case [the PI] ask[ed] for them," and, "just in case [the PI] wants to stop my work because of an incorrect [elemental analysis] value".[52] He wanted to move forward with his preferred research in the limited amount of time remaining before he left the PI's laboratory. The subject's statements show that he purposefully created the falsified report to deceive the PI if the PI questioned the subject's results.[53] Thus, we conclude the subject purposefully created a falsified document.

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[51] Exhibit 6, pg. 1.

[52] Exhibit 7, pg. 2.

[53] The subject claimed that he wrote "working value" and "not real" in a language no one, other than himself, in the group reads at the top of the report to substantiate his claim that this report should not be used (see Exhibit 10). However, those phrases did not appear on the original, altered report that was left in the copy room, and therefore, could not have been on the original copy at the time it was made. Furthermore, if the subject had really intended that the report not be used, he would have written those statements in English. We agree with the investigation Committee and conclude that the carefulness of the forgery shows the subject intended to produce a report that would fool anyone who saw it into believing it was authentic. His plan apparently worked. By his own admission, when his co-author found the report in his desk, the forgery was apparently so convincing that she did not doubt the report's authenticity and incorporated the results into the manuscript she was preparing.

Seriousness

The subject's action is a serious deviation from the accepted practice not only in the subject's scientific community, but also in the wider scientific community. The University concluded the subject "falsified research results and engaged in research misconduct,"[54] and "that virtually all professional scientists worldwide would recognize what [the subject] did as improper."[55] We agree. By carefully cutting and pasting falsified data into the report to deceive the PI, the subject seriously deviated from what the scientific community expects in accurately reporting scientific results. The accurate reporting of scientific results is also NSF's expectation. In addressing the seriousness of the subject's act of falsifying data, we discuss uncontested instances where the falsified data were incorporated into a manuscript, and where the 'target' compound was described.

Falsified data in the manuscript

The subject claimed that his co-author retrieved the data from his personal files and put them in the manuscript for publication, without ever mentioning it to him. We find it difficult to believe that the subject's wife, who is also a co-author and a member of the research team he directed and who was preparing the manuscript of their joint research, would not, at any time, mention to the subject that she had removed data from his desk, and incorporated it into the manuscript.

Even accepting the subject's claim, the subject's co-author knew where to look for the subject's research results, as he left the report in his desk where he typically kept his other laboratory notebooks. The PI thought that leaving the report

> "in an official place in the lab where anybody could find it . . . is an equal case of misconduct, instead of the active case of reporting it yourself, as a passive case where you are leaving it to be discovered by somebody, [who] would have no reason to think [about] or mistrust the data."[56]

We agree with the Committee that "[the subject] is ultimately responsible for the fact that the altered results were presented to [the PI]" in a draft manuscript and "that had the alteration not been discovered, the altered data would very likely have been included in a published report on this research."[57]

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[54] Exhibit 4, pg. 3.
[55] Exhibit 4, pg. 4.
[56] Exhibit 5, pg. 4.
[57] Exhibit 4, pg. 3.

Presenting data to the research group

The PI claimed that the subject presented the falsified results associated with the compound in question. The subject claimed that he presented only the existence and a generalization of the characterization of the compound, and said that when he presented the transparencies to the group, he explained "that the work is in progress."[58] However, the subject added that he even "stepped further in the reaction chemistry . . . because their reality or existence was never questioned by me and even not by [the PI]."[59] These varying accounts were not resolved by the Committee and we do not resolve them here.

Even if the subject did not present the falsified numerical values, he "mentioned the existence and characterization of the compound,"[60] notwithstanding the fact that the results of the company's analysis did not support the conclusion that he had successfully synthesized the target compound. He misled his research group into believing that his research was proceeding as planned. At no time did the subject indicate to the PI or group that he had, in fact, not produced a pure compound or that his methodology had not worked as expected. Because the results of the company's analysis of the compound did not match the subject's theoretical prediction, by such a large degree that he felt obliged to falsify the results in case he were questioned about them, he should have indicated to the group either that he had not successfully prepared the compound he sought or that he was having difficulty doing so.

Therefore, we do not find the subject's explanation, even if accurate, exonerating. When scientists present research results, whether or not the results are preliminary or final, they are expected to provide real data derived from actual experiments or calculations. Presentation of preliminary results does not give one license to falsify data or lead the audience into believing one has obtained results that, in fact, one has not. If the subject had not intended to deceive the group, he would not have claimed he produced the compound in the first place. We believe the subject, by presenting the compound as the desired result, deceived his group into thinking his research was progressing according to his theoretical predictions, to avoid any questions that might be raised about the real data and its implications for his methodology. The subject's actions violate the trust scientists have that each faithfully presents the results from experiments.[61] Laboratory group meetings are specifically designed for presenting data and results, both good and bad, for feedback. This is one of the first forums for updating the PI and seeking advice from colleagues.

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[58] Exhibit 9, pg. 5.

[59] Exhibit 9, pg. 2.

[60] *Ibid.*

[61] Prior to this incident, analysis reports were returned directly to the person in the laboratory. The PI has since installed a fax machine in his laboratory and reports are now received by his secretary.

OIG'S CONCLUSION REGARDING MISCONDUCT IN SCIENCE

We conclude that in creating the report with the intent to deceive the PI, the subject acted purposefully. Since (a) the uncontested evidence establishes the conclusion that the subject falsified the report, (b) that he did so purposefully, and (c) the act itself is a serious deviation from accepted practices, we conclude that the subject committed misconduct in science.

OIG'S RECOMMENDED DISPOSITION

Under § 689.2(b) of NSF's misconduct in science and engineering regulation, when deciding what actions are appropriate when misconduct is found, NSF officials should consider the seriousness of the misconduct, the intent with which the subject acted, any evidence of a pattern, and finally, its relevance to other funding requests or awards involving the university or the individual.

We conclude the subject purposefully falsified data, and that this behavior was a serious deviation from the practices of both the subject's research community as well as the broader scientific community, and that it violated NSF's expectation that research is to be carefully performed and accurately reported.

Although debarment is an action that can be taken to protect the government's interest in cases of falsification, for several reasons, we do not believe it is necessary in this case. The Committee reviewed the subject's and PI's notebooks and other materials and found no evidence of a pattern of data falsification. The subject "indicated that this was the only incident in his career of this nature."[62] The subject's falsification was limited to two microanalysis test results in one technical report. Second, the subject's responses contain statements of his remorse, and the University inquiry report noted that the subject "expressed a great sense of guilt and frustration about this incident and clearly regrets his actions."[63] Finally, the subject's access to NSF funding is limited because he has returned (for the foreseeable future) to his home country and is not affiliated with a U.S. institution.[64] A citation search shows that since 1994, before this incident of misconduct, until now, he had published papers with only one U.S. scientist not affiliated with the University. We believe that the certification and assurance

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[62] Exhibit 6, pg. 1.

[63] Exhibit 3, pg. 2.

[64] NSF rarely provides support to foreign institutions (see NSF's GRANT PROPOSAL GUIDE Ch. 1, § C(6)). Such awards are made only when the foreign organization has unique facilities, geographic location, or other resources not available to U.S. investigators, and are a very small fraction of NSF support (see NSF's PROPOSAL AND AWARD MANUAL § 335). If a foreign scientist is affiliated with a U.S. institution that permits him or her to be a principal investigator, NSF imposes no additional requirements based on the scientist's nationality.

actions recommended below are appropriate actions to take in this case.[65] They ensure that, if the subject affiliates himself with an NSF-supported activity, he must (a) review the concept of misconduct and state that he has not committed additional acts of falsification, and (b) provide for an independent review of his work.

OIG recommends several actions by NSF in response to the misconduct in science by the subject.

1) The subject should be sent a letter of reprimand stating that NSF has made a finding of misconduct in science against him.[66]

2) NSF should also require, for a period of 3 years from the final disposition of this case, that in association with any NSF-supported publication or submission to NSF, the subject separately certify to OIG that the document contains, to the best of the subject's knowledge, no falsified data and presents neither hypotheses nor conclusions based upon falsified data.[67]

3) NSF should, for the same period of time, require the subject to solicit an assurance from his Dean, or appropriate supervisory official at his university, that to the best of his or her knowledge, the subject's work associated with any NSF-supported publication or submission to NSF does not contain falsified data and presents neither hypotheses nor conclusions based upon falsified data.

The subject's certification and the Dean's, or appropriate university official's, assurance should be sent to the Assistant Inspector General for Oversight for retention in OIG's confidential file on this matter.[68]

THE SUBJECT'S RESPONSE TO OIG'S REPORT

The subject provided a summary of facts from his point of view with his response to OIG's draft investigation report (Exhibit 13). The subject's response contained no new information that caused us to modify our report. The subject commented that the VP had said "it is unclear whether [the subject] intended to use these false data in reports," and the subject's "actions had very little consequence to [the PI's] research program." The subject acknowledged that "what [he] did is wrong . . . and [he] deeply regret[s] the action."[69] The subject conceded that he "ought to accept the recommended actions by the NSF OIG" and that he "understand[s] that in case of

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[65] NSF management may choose to notify the subject's home university of his misconduct. After considering all of the circumstances—including the fact that it is highly unlikely that the subject will have access to federal funds and the fact that this was an isolated instance of misconduct—we are not recommending notification of the subject's home university.

[66] This is a Group I action (§ 689.2(a)(1)(i)).

[67] This is a Group II action (§ 689.2(a)(2)(ii)).

[68] This is a Group I action (§ 689.2(a)(1)(iii)).

[69] Exhibit 13, pg. 1.

any kind of NSF connection [the subject] [will] have to get checked all data, hypothesis etc. by an independent authority, who will provide the appro[p]riate assurances for [OIG]."[70]

[70] Exhibit 13, pg. 2.