THE GALLUP ORGANIZATION

for

The Office of Research Integrity

Final Report: Observing and Reporting Suspected Misconduct in Biomedical Research

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THE OFFICE OF RESEARCH INTEGRITY
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ABSTRACT

In this study we examine scientists' reports on suspected research misconduct. The available empirical literature attempting to estimate the extent of research misconduct in the U.S. has been difficult to interpret because of a number of methodological problems. This study attempts to address those concerns by: using a consistent definition of misconduct, a consistent and reasonably short period of observational recall, verification of observation by independent reviewers, avoidance of duplicate observation, coverage of a wide variety of scientific fields, and adequate sample size and response rate. In the fall of 2005, an anonymous survey was mailed to 4,298 randomly selected principal investigators of NIH-funded research grants (R01) who worked in 4,298 unique departments at 605 universities, institutes, hospitals and other organizations. 2,226 scientists returned completed surveys for a response rate of 51%.

192 scientists reported observing 265 incidents of misconduct. After review by knowledgeable raters, it was determined that 64 of these incidents were scientific misbehaviors, but did not meet the threshold of the federal definition of misconduct. This left 164 investigators (7.4% of the total sample) reporting 201 incidents. If the rate of scientists observing suspected misconduct is applied to the entire population of scientists supported by NIH (about 155,000), then the number of scientists observing incidents of suspected research misconduct in that population would be about 4650 incidents per year. If we use a more conservative estimate and use 4298 as the denominator for the 201 incidents than we would see 2325 possible incidents of suspected misconduct.

In studying all incidents of possible misconduct 120 (60 percent of all incidents) involved falsification or fabrication with or without plagiarism. Another 73 incidents (36 percent of incidents) involved plagiarism only and 8 incidents (4%) were unspecified as to type.

Fifty eight percent of the suspected incidents of research misconduct were reported to officials at the survey respondent's institution; 37 percent were not; the reporting of the remaining incidents was uncertain. In 24% of the incidents it was the survey respondent who reported the suspected misconduct to institutional officials. Having read the institution's policy on responding to misconduct and knowing to whom to make an allegation of misconduct are both significantly correlated with indicating that an incident had been reported to the institution and that the survey respondent did the reporting.

Scientists of younger age and with fewer years in the current job are significantly more likely to have observed suspected misconduct. Other scientist characteristics such as highest degree (Ph.D/M.D.), rank, type of research (basic/clinical) or percent of time on research are unrelated to observing or reporting suspected misconduct. Institutional characteristics such as being a degree-granting institution, highest degree offered, whether a medical school, public or private institution, or size of the sampled department are also unrelated to observing suspected misconduct.

Scientists believe that the best way to detect and prevent research misconduct is through close supervision of research work and place this responsibility on the principal investigator. Specific tools are reviewing data, reproducing results, and other review,

audit, and quality control procedures. Scientists also endorse open communication as a way to detect research misconduct. Moreover, scientists believe that the most important thing that can be done to increase the likelihood of reporting suspected research misconduct is to protect the anonymity of the person making the allegation. However, they also believe that it is important to have a policy in place with training and a system for reporting.

This report will contribute to the ongoing dialogue on research misconduct as well as what role departments, institutions and the federal government should take to promote greater research integrity.

INTRODUCTION

Although many historical instances of research misconduct are recorded (Broad & Wade, 1982; Kohn, 1986), little systematic attention was given to research misconduct until notable cases of research misconduct surfaced in the late 1970's (Woolf, 1981) and early 1980's. Congress legislated oversight of the integrity of U. S. federally funded research in the Health Research Extension Act in 1985. The Public Health Service (PHS) published its first regulation implementing that act in 1989 (42 C.F.R. Part 50, Subpart A). Congress established the Office of Research Integrity (ORI) within the Office of the Secretary of Health and Human Services in 1993. The Office of Science and Technology Policy in the Executive Office of the President published the Federal Research Misconduct Policy in 2000 and the PHS revised its regulation in 2005 (42 C.F.R. Part 93).

Throughout this period there was little agreement on the amount of research misconduct occurring. The dominant opinion in the research community was that research misconduct was a rare event as evidenced by the number of known cases. Others thought the known cases were only the "tip of the iceberg." From 1994-2003, ORI annually opened an average of 34 cases, closed 33 cases, and made 13 research misconduct findings. From 1992-2001, 248 institutions reported receiving a research misconduct allegation or conducting an inquiry or investigation. Most institutions reported such activity in only one year and reported only one incident. Meanwhile, the "tip of the iceberg" view was supported by several studies that reported much higher incidences of research misconduct but they were severely criticized for methodological flaws. So after more than two decades of discussion and research, the need still remains to address the

question whether research misconduct is a rare event or whether the known cases represent the "tip of the iceberg." (Smith, 1996; Wocial, 1995)

A number of investigators have addressed the issue of the incidence of research misconduct in the U.S. and internationally with limited results (see Swazey, Anderson &; Tangney, 1987; St. James-Roberts, 1987; Kalichman & Friedman, 1992; Rankin & Esteves, Lewis, 1993 1997; Martinson, 2005). The present study provides an estimate of the number of instances of suspected misconduct observed by scientists who are principal investigators of research funded by the U.S. National Institutes of Health. The study design attempts to address a number of shortcomings identified in previous studies:

1) *Lack of consistent definitions for research misconduct*. The present study employs the definition published in the 2000 Federal Research Misconduct Policy which limits research misconduct to fabrication, falsification and plagiarism. The survey respondents are given the definition in the questionnaire to guide their responses as to observing instances of suspected misconduct.

2) *Lack of a reasonable, consistent reference period for reporting incidence of events related to suspected research misconduct*. We employ the period of the three previous academic years, 2003-2005.

3) *Lack of verification of reported instances of suspected misconduct*. Unlike previous studies, this investigation treats reported incidents as "suspected" rather than "actual"

misconduct because of the low rate at which "suspected" misconduct is substantiated when adjudicated. Only about 6% of the allegations received by ORI from 1994-2003 were substantiated. In addition, this study includes probes that inquire about the circumstances of each incident of suspected misconduct asking for a verbatim description that can be used to verify whether the incident meets the minimum requirement for misconduct. Furthermore, the survey respondent is asked to provide the type of suspected research misconduct (fabrication, falsification, or plagiarism), the rank or title of the researcher(s) allegedly committing research misconduct, how the survey respondent became aware of the suspected research misconduct (for example whether it was directly observed or inferred from suspicious research products), whether or not the suspected misconduct was reported to officials at the institution, and whether or not it was the survey respondent who reported the suspected misconduct to officials at the institution.

4) Duplicate reports of the same instances of misconduct. Some previous studies have sampled multiple scientists from the same department within a funded institution increasing the risk that the same misconduct incidents would be reported by more than one survey respondent. The present study limits the sample to one survey respondent per academic department or the equivalent in non-academic settings.

5) Failure to cover a broad spectrum of research fields. The sample is a random selection of principal investigators of investigator-initiated (R01) awards and as such should proportionally represent the research fields funded by the National Institutes of Health.

6) *Inadequate sample sizes for the intended analyses.* The present study identified 4,298 scientists funded from 1998 to 2004 from 4,298 unique departments located in 605 universities, institutes, hospitals, and other organizations.

7) *Low response rates*. Most previous surveys have had response rates below 40 percent and some below 25 percent. The present study used a total survey design approach and achieved a 51 % response rate.

METHODS

Sample

The goal of the sample was to achieve one observer per department. As noted above, this was to eliminate the possibility that multiple observers per department might be reporting on the same incident. The desired sample was to be principal investigators of investigator-initiated research grants (R01's) awarded by the U.S. National Institutes of Health (NIH), but the available frame was a listing of the awards, not the investigators, and since investigators may have multiple awards, considerable manipulation of the list was required. NIH keeps an administrative file of awards that includes contact information. NIH provided the investigators with a one-in-five sample of their records for the years 1998-2004 using the last digit of the grant number which is random with respect to investigators and institutions. This 20 percent sampling resulted in a file containing information on 37,433 awards.

This file contained multiple awards per investigator, so the first step was to de-duplicate the file with respect to the investigator. NIH assigns a unique ID to investigators so that applications using different forms of a person's name can be identified as having the same principal investigator. This unique investigator ID was used to reduce the file to 11,588 investigators.

The file had to be augmented because the contact information may not be for the principal investigator, but rather for a research or other administrative office at the investigator's institution. Where possible the investigators address was ascertained on the institutions Web site. Also, a commercial firm was used to look-up mailing addresses for some investigators.

Finally, the NIH database has very incomplete information about the investigator's department at his or her institution. Since the sample intended to select only one investigator per department it was important to have a departmental affiliation for each person. Departmental affiliations also were ascertained on institutional Web sites. Non-academic settings represent a special case. Often these institutions are organized along academic lines with sub-units identified with scientific disciplines or specialties. In most cases, these subunits were identifiable and treated as equivalent to departments in academic settings for purposes of sampling. In some non-academic settings, there is no departmental structure. So, in those cases, the institution was treated as having a single department for sampling purposes.

As there were multiple investigators per department in many cases, a random number generator was used to select one per department for the present study. This reduced the final sample from 11,588 to 4,298 investigators.

Data Collection Procedures

Sampled investigators were mailed questionnaire and assured of anonymity. The data collection consisted of five contacts per sampled scientist. Investigators were mailed a prenotification letter explaining the study and asking them to watch for the questionnaire mailing. The initial mailing included a cover letter appealing for the investigator's participation as well as the questionnaire. The eight-page questionnaire consisted of 21 questions that are detailed in the following section.

After one week had elapsed, a reminder postcard was mailed to each sampled investigator. In another two weeks an additional survey packet was mailed. After an additional two weeks, another letter was sent indicating that the data collection period would soon close and asking for the investigator's participation. These procedures resulted in 2,226 returned questionnaires for a response rate of 52 percent.

Measures

Questions about Suspected Misconduct

The measures of alleged misconduct are constructed from a series of questions ascertaining how often the scientist has observed possible research misconduct in his or her department or equivalent organizational unit, what type of suspected misconduct was observed, and how the survey respondent acted as a consequence. (See Appendix A for the full survey instrument.) These questions are introduced by a short paragraph as follows.

> This section asks about suspected research misconduct you have observed by **researchers** in your department or equivalent organizational unit or about which you have other direct evidence. By **researchers** we mean principal investigators, research associates, postdoctoral fellows, research assistants, research nurses/coordinators, lab technicians, graduate, and undergraduate students.
>
> In responding to the questions below, use as your reference point the Federal Research Misconduct Policy, published by the Office of Science and Technology in the White House in December 2000.

In order to provide standardization, we employed the Federal definition of research misconduct. Without a standard definition in mind, survey respondents might have used

a definition employed at their local institution, which could vary from institution to institution, or might have used a personal definition that would introduce considerable measurement error. The definition is as follows:

> Research misconduct is defined as fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results.
>
> Fabrication is making up data or results and recording or reporting them.
>
> Falsification is manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record.
>
> Plagiarism is the appropriation of another person's ideas, processes, results, or words without giving appropriate credit.

Initially the scientist is asked for the number of times that he or she has observed suspected misconduct in the past three academic years. A period of three years was chosen because previous research had been criticized for leaving the time period open-ended. Three years might be too long a recall period for minor events, but for something as consequential as research misconduct, a scientist could reasonably be expected to recall within a three-year span.

> In the past three academic years, how many times have you observed or had other direct evidence of researchers in your department (or equivalent organizational unit) allegedly committing research misconduct (**fabrication, falsification, or plagiarism**) in proposing, performing, or reviewing research, or in reporting research results?

Scientists reporting "zero times" are skipped to a section of survey respondent background questions. Those who have indicated that they observed the suspected misconduct "one", "two", three" or "four or more times" were asked:

> Please provide a brief description of up to three of the most recent incidents of suspected research misconduct in the past three academic years you have observed or had other direct evidence of, without providing any names or identifying information. For example, *"Colleague changed values of a blot test to be more consistent with their hypothesis and published the results."*

Finally, the scientist is asked to report on several aspects of the incident and how he or she reacted, including:

- Type of suspected research misconduct you observed/had direct evidence of (fabrication/falsification/plagiarism)

- Rank or title of the researcher(s) allegedly committing research misconduct

- How the scientist became aware of the suspected research misconduct

  (directly observed the suspected misconduct/observed products of the suspected misconduct and could infer who did it with confidence/was told about the suspected research misconduct by someone else then observed the misconduct or products of misconduct/did not observe the suspected misconduct, but have other direct evidence/other)

- Whether or not the suspected misconduct was reported to officials at the institution

- Whether or not it was the survey respondent who reported the suspected misconduct to officials at the institution

FINDINGS

Characteristics of the Sample

As shown in Table 1, the sample resulted in 2,226 returned questionnaires. Of these, 14 were unusable for the present analysis as they lacked information on observing

misconduct. This results in an effective sample size of 2,212 for the analysis. In all, 192 scientists reported 265 incidents of suspected misconduct. As will be explained shortly, the evience provided for 64 (24%) of these incidents indicated that they do not meet the

Table 1. Results of the Data Collection

Disposition	Number of Scientists	Suspected Misconduct	Number of Incidents
Initial mailing	4,298		
All responses	2,226		
Did not answer misconduct questions	14		
Answered misconduct questions	2,212		
Observed no suspected misconduct	2,020		
Observed suspected misconduct	192	Total Incidents	265
Persons adjusted by review	28	Adjusted incidents	64
Remaining observing suspected misconduct	164	Remaining incidents	201

federal definitions of falsification, fabrication or plagiarism. When these 64 incidents are removed from consideration, then 164 scientists are describing 201 incidents that met the threshold for a possible allegation under the federal definition of research misconduct.

Characteristics of the scientists in the sample are presented in Table 2. These investigators tend to be older and more experienced than average with more than 83 percent over the age of 45 and 94 percent of senior rank. Senior rank includes senior or associate professors in the academic or research tracks and their equivalent in non-academic settings. By contrast only about 52 percent of faculty in U.S. medical schools are of senior rank, that is, either full or associate rank (Bernard Becker Medical Library, 2004). Nearly 60 percent of these investigators have been in their current job for 11 years or more.

Over three fourths (76%) of the investigators hold the Ph.D. degree, about 16 percent hold the M.D. degree, and the remaining 8 percent hold both degrees. Nearly fifty-six percent engage in basic science research only, 30 percent engage in clinical research only, nine percent in both basic and clinical research and five percent in other research. Other research consists largely of public health, social science or engineering research. Seventy-eight percent of the investigators spend 50 percent or more of their time on research.

Table 2. Characteristics of the Sample

	Number	Percent
Scientist's Age		
Under 44	363	16.5%
45-54	956	43.4%
55 or older	883	40.1%
Scientist's Years in Current Job		
0 - 10 years	895	40.9%
11 – 20 years	737	33.7%
21 – 30 years	409	18.7%
31 or more years	149	6.8%
Scientist's Rank		
Senior Researcher	2064	93.7%
Junior or Other Researcher	138	6.3%
Scientist's Highest Degree		
PhD only	1657	76.1%
MD only	345	15.8%
Both PhD and MD	176	8.1%
Scientist's Research		
Basic science only	1221	55.8%
Basic science and clinical	200	9.1%
Clinical only	657	30.0%
Other	110	5.0%
Scientist Proportion of Time Spent on Research		
Less than 25%	88	4.0%
25-49%	390	17.7%
50-74%	703	31.9%
75% or more	1021	46.4%

Missing values are excluded

The original sample of 4,298 departments represents 605 organizational entities. As defined by NIH, these entities may be listed as universities, hospitals or medical centers, research institutes or other organizations although, in some cases, one might think of them as belonging to the same institution. Thus, NIH might treat a university's graduate school, medical school, and perhaps affiliated hospitals or institutes as separate fiscal units for purposes of awarding grants. However, in this sample, an investigator is affiliated with one and only one entity for purposes of sampling. Table 3 clarifies the institutional setting in which these investigators work. The majority of investigators, 88%, are affiliated with a degree-granting institution while 12% are affiliated with non-degree granting institutions. Nearly 56% perform their research in a school of medicine. Overall, the degree granting institutions are largely ones that grant the doctoral degree as the highest degree in most departments (85 percent). About three percent of the scientists are in institutions in which highest degree granted is the masters or undergraduate degree. Fifty-seven percent of the scientists are in public institutions and the remainder in private institutions.

Most investigators, 68 percent are in departments (or the equivalent in non-academic settings) with 40 or fewer professionals. However, 14 percent are in departments with more than 100 professionals.

Of the 2,212 scientists who responded to questions about research misconduct, there were 192 scientists (8.7%) who indicated that they had observed or had direct evidence of researchers in their own department committing suspected research misconduct over the

Table 3. Institutional Context of Sampled Scientists

	Number	Percent
Degree Granting Institution		
Yes	1893	88.3%
No	252	11.7%
Medical School		
Yes	1197	55.8%
No	947	44.2%
Most Departments Offer…		
Doctorate/Professional Degrees	1813	85.2%
Masters Degrees	49	2.3%
Undergraduate Degrees Only	20	0.9%
Not Degree Granting	245	11.5%
Public or Private Institution		
Public	1215	56.9%
Private	921	43.1%
Size of Scientist's Department		
1 – 20	842	39.4%
21 – 40	617	28.8%
41 – 60	220	10.3%
61 – 80	93	4.3%
81 – 100	60	2.8%
More than 100	307	14.4%

past three academic years. The questionnaire asked those observing suspected misconduct to provide a brief description of up to three of the most recent incidents without providing any names or identifying information. These descriptions are provided in Appendix B.

The 192 scientists described a total of 265 incidents (the sum of 192 1st incidents, 59 2nd incidents and 14 3rd incidents). This is the crude number of incidents. Two knowledgeable coders independently evaluated the 265 incidents recording whether the description was consistent with the federal definition of research misconduct, inconsistent with misconduct, or could not be determined. The reviewers eliminated instances which did not represent a possible case of research fabrication, falsification or plagiarism. After the reviewers had independently reviewed and categorized the responses, they agreed on the classification of 256 cases and disagreed on only nine cases. After adjudicating the nine disagreements, it was determined that 64 reports, 24 percent of the total, should not be considered misconduct by the federal definition. These deletions affected reports of suspected misconduct observed by 40 scientists. For 28 of these scientists, all their observations of suspected misconduct were rejected as failing to fit the definition. The remaining 12 scientists still had at least one observation fitting the definition of suspected misconduct.

Table 4 presents a categorization of the activities that were included by survey respondents as suspected misconduct that the reviewers found not to rise to the level of a possible allegation of misconduct. The University of Pittsburgh's investigation

Table 4. Incidents Reflecting Research Misbehaviors, Not Research Misconduct

Research Misbehaviors	1st Incident	2nd Incident	3rd Incident	Total Number	Percent
Questionable Research Practices That Impact on Data	9	3	1	13	20.3%
Plagiarism of Assignments, Slides, Etc.	9	4	0	13	20.3%
IRB and Human Subject Issues	7	1	1	9	14.1%
Conflict of Interest Issues	3	6	0	9	14.1%
Authorship Issues	4	0	1	5	7.8%
Other	8	7	0	15	23.4%
Total	40	21	3	64	100.0%

committee in a recent review of a misconduct case has termed behaviors that do not reach the threshold of misconduct as "research misbehaviors**"** (Martinson et al., 2005; Holden, 2006). A typical example of a rejected incident is one in which the a colleague of the scientist used the scientist's research materials and his postdoctoral fellow's time, yet did not include the scientist as author on the resulting publication or acknowledge his role in the research.

The table shows that about 40% of the research misbehaviors fall into the two most frequent categories comprising questionable research practices that impact on data and plagiarism involving student assignments and slides. These are followed by two categories comprising about a quarter of the misbehaviors: IRB and human subjects' issues and conflict of interest issues. Authorship disputes round out the substantive categories with a substantial group of other misbehaviors accounting for over 20% of the incidents.

When these 64 reports that were rejected are removed from being considered allegations of misconduct, there remain 164 scientists (7.4%) who observed suspected research misconduct one or more times for a total of 201 observations (see Table 5). The remaining findings reported here are based on the adjusted number of incidents of misconduct. The characteristics reported below reflect characteristics of the incidents of suspected misconduct reported by the 164 scientists. If a scientist made multiple reports, only one accepted incident was included in the analysis.

Adjusted Incidents of Fabrication, Falsification, Plagiarism

A total of 164 investigators (7.4%) reported having observed at least one incident of suspected misconduct over the period of the previous three academic years (Table 5, "1st Incident, Adjusted"). Of these incidents 100 (61 percent of all incidents) involved fabrication or falsification. A few of these 100 incidents also involved plagiarism. Another 57 incidents (35 percent of incidents) involved plagiarism only. Seven incidents (4%) were not identified by type.

Characteristics of Adjusted Incidents of Suspected Misconduct

The largest group identified as being involved in misconduct by these investigators was postdoctoral fellows (Table 5). Twenty-six percent of the incidents involved postdoctoral fellows. The next largest group reported to be involved in misconduct were professors or senior scientists who were involved in 21 percent of the incidents. Assistant level professors or scientists and graduate students were reported to be involved in about 16 percent of incidents, respectively, and associate professors or scientists were reported to be involved in about 13 percent of incidents and an "other" category of lecturers, research nurses, and lab technicians was identified in about 12 percent of cases. All ranks were observed as engaging in suspected research misconduct.

Table 5. Suspected Misconduct, Unadjusted and Adjusted

	1st Incident			2nd Incident			3rd Incident				
	Crude	Adjusted*		Crude	Adjusted*		Crude	Adjusted*		Total	
	Number	Number	Percent	Number	Number	Percent	Number	Number	Percent	Crude	Adjusted
Observed Suspected Misconduct											
Yes	192	164	7.4%	59	32	1.4%	14	5	0.2%	265	201
No	2020	2048	92.6%	2153	2176	98.6%	2198	2205	99.8%		
Type of Suspected Misconduct											
Fabrication or falsification	115	100	61.0%	32	17	53.1%	8	3	60.0%	155	120
Plagiarism only	69	57	34.8%	24	14	43.8%	4	2	40.0%	97	73
Unknown	8	7	4.3%	3	1	3.1%	2	0	0.0%	13	8
Rank of Researcher(s) [May add to more than 100% due to multiple responses]											
Professor or Sr. scientist	47	34	20.7%	18	7	21.9%	6	3	60.0%	71	44
Assoc. professor or scientist	26	21	12.8%	12	7	21.9%	3	0	0.0%	41	28
Asst. professor or scientist	33	27	16.5%	10	7	21.9%	1	0	0.0%	44	34
Postdoctoral fellow	43	43	26.2%	7	5	15.6%	3	2	40.0%	53	50
Graduate student	32	26	15.9%	6	3	9.4%	1	0	0.0%	39	29
Other (Includes 1 Unknown)	22	20	12.2%	8	4	12.5%	1	0	0.0%	31	24
How Became Aware of Suspected Misconduct											
Directly observed	21	17	10.4%	15	6	18.8%	0	0	0.0%	36	23
Observed products	52	44	26.8%	15	8	25.0%	5	1	20.0%	72	53
Told first, then observed	57	51	31.1%	17	7	21.9%	2	2	40.0%	76	60
Other direct evidence	32	24	14.6%	6	5	15.6%	2	1	20.0%	40	30
Other	26	24	14.6%	5	5	15.6%	4	1	20.0%	35	30
Don't recall	1	1	0.6%	0	0	0.0%	0	0	0.0%	1	1
No answer	3	3	1.8%	1	1	3.1%	1	0	0.0%	5	4
Was Suspected Misconduct Reported											
Yes, reported by survey respondent	46	43	26.2%	16	6	18.8%	4	0	0.0%	66	49
Yes, reported by someone else	65	58	35.4%	13	8	25.0%	1	1	20.0%	79	67
No, not reported	73	56	34.1%	24	16	50.0%	5	3	60.0%	102	75
Don't know	4	3	1.8%	4	1	3.1%	3	1	20.0%	11	5
No answer	4	4	2.4%	2	1	3.1%	1	0	0.0%	7	5

* Recodes cases for incident #1 determined by independent raters not to be misconduct.

Basis of Knowledge of Possible Allegation

Most commonly, investigators having observed suspected misconduct indicated that they were told about the suspected research misconduct by someone else, but then observed the misconduct or products of misconduct for themselves. This group comprises 31 percent of the investigators. Another 27 percent observed the products of the suspected research misconduct and could infer who engaged in misconduct with confidence and 10 percent of investigators reported that they had directly observed the suspected research misconduct as it happened. Nearly 15 percent indicated that they had other direct evidence of suspected misconduct. Each case falling into the category "other direct evidence" was examined by the authors to determine if these were plausible interpretations of possible misconduct. The authors determined that in all these cases, that the scientist had offered reasonable statements supporting direct knowledge of suspected misconduct rather than hearsay. For instance, some of these scientists knew of an incident because it was being investigated by their department or institution.

Reporting Suspected Misconduct

As Table 5 shows, 62% of investigators say that the first incident of suspected research misconduct were reported to officials at the institution. In 26% of the incidents it was the survey respondent who said he or she reported the suspected misconduct to institutional officials while in 35% of cases it was someone other than the survey respondent. In 34% of the cases the survey respondent said "no," the incident was not reported to institutional officials, although they could also have checked off "do not know," and in 4% of the

cases it is unknown whether the incident of suspected misconduct was reported or not. This proportion changes slightly when all cases are examined.

Table 6 shows that older scientists tend to have a greater likelihood of having reported misconduct to the institution. However, this relationship of age to reporting is not statistically significant. None of the other scientist characteristics—type of degree (Ph.D., M.D., or both), years in current job, rank of researcher, type of research (basic, clinical, or both), or proportion of time spent in research—is related to the likelihood of reporting suspected research misconduct.

Table 6 further shows that scientists who have read their institutions policy on procedures for handling allegations of misconduct or who say they are aware of whom to report allegations to at their institution are more likely to be observing incidents of suspected misconduct that have been reported either by someone else or by themselves. About 71 percent of the incidents described by scientists who have read their institutions policy have been reported, whereas only 42 percent of incidents described by those who have not read their institutions policy have been reported.

Table 6. Reporting Possible Allegation and Scientists Attributes

	Not Reported to Institution		Reported by Someone Else		Reported by Survey Respondent	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Scientist's Age						
Under 44	14	51.9%	9	33.3%	4	14.8%
45-54	26	33.8%	29	37.7%	22	28.6%
55 or older	14	30.4%	17	37.0%	15	32.6%
Scientist's Highest Degree						
PhD only	43	38.4%	38	33.9%	31	27.7%
MD only	9	39.1%	8	34.8%	6	26.1%
Both PhD and MD	2	14.3%	8	57.1%	4	28.6%
Scientist's Years in Current Job						
0 – 10 years	32	40.0%	24	30.0%	24	30.0%
11 – 20 years	17	41.5%	16	39.0%	8	19.5%
21 or more years	5	17.9%	14	50.0%	9	32.1%
Scientist's Rank						
Senior Researcher	49	35.0%	52	37.1%	39	27.9%
Junior or Other Researcher	5	50.0%	3	30.0%	2	20.0%
Scientist's Research						
Basic science only	25	32.1%	34	43.6%	19	24.4%
Basic science and clinical	3	23.1%	5	38.5%	5	38.5%
Clinical only	24	47.1%	13	25.5%	14	27.5%
Other	1	16.7%	2	33.3%	3	50.0%
Scientist Proportion of Time Spent on Research						
Less than 25%	3	42.9%	2	28.6%	2	28.6%
25-49%	8	34.8%	10	43.5%	5	21.7%
50-74%	20	37.7%	17	32.1%	16	30.2%
75% or more	23	34.3%	26	38.8%	18	26.9%
Read Institution's Policy on Responding to Misconduct						
Yes	33	28.9%	48	42.1%	33	28.9%*
No	21	58.3%	7	19.4%	8	22.2%
Knows to Whom in Institution to Make an Allegation						
Yes	38	29.9%	53	41.7%	36	28.3%**
No	15	68.2%	2	9.1%	5	22.7%

Missing values are excluded
* Chi square test 10,84, 2 df, $p < .004$; ** Chi Square test, 13.2, 2 df, $p < .001$

Relationship of Scientists' and Institutional Characteristics to Suspected Misconduct

Tables 7 and 8 report on the relationships between observed suspected misconduct and various scientist and institutional characteristics. The odds ratio is used to characterize the strength of relationship and the 95% confidence interval around the odd ratio is reported. The odds of suspected misconduct is the ratio of the count of suspected misconduct to the count of no misconduct. For example, the odds of suspected misconduct for scientists under the age of 44 is 30/333 = 0.090. The ratio of the odds calculated for one level of scientist characteristics to the odds of suspected misconduct for another level of scientist characteristics is an indication of whether the rate of misconduct differs between levels. For example the odds of suspected misconduct for scientists 55 or older is 49/834 = 0.059 and the odds ratio comparing scientists under 44 with scientists 55 or older is 0.090/0.059 = 1.5. Scientists in the younger group are 1.5 times as likely as scientists in the older group to have observed suspected misconduct. If the confidence interval does not include 1.0, then the relationship is unlikely to have occurred due to chance. In other words, this example is considered statistically significant.

Among scientist characteristics (Table 7) lower age of the scientist and fewer years in the current job are related to higher levels of observed suspected misconduct. Scientists under the age of 44 are 1.5 times as likely as those 55 or older to have observed suspected misconduct, while those aged 45-54 are 1.6 times as likely. Similarly, scientists with 10 or fewer years in their current job are 1.8 times as likely to observe suspected misconduct as scientists with 21 years or more in their current job.

Table 7. Suspected Misconduct and Type of Suspected Misconduct by Characteristics of the Observing Scientist

	Misconduct				Any vs. None		FF vs. P	
	No Misconduct	Any Misconduct	Fabrication or Falsification	Plagiarism Only	Odds Ratio	95% CI	Odds Ratio	95% CI
Scientist's Age								
Under 44	333	30	18	11	1.5	(1.0, 2.5)	1.3	(0.5, 3.5)
45-54	872	84	49	30	1.6	(1.1, 2.4)	1.3	(0.6, 2.9)
55 or older	834	49	33	15	1.0		1.0	
Scientist's Highest Degree								
PhD only	1534	123	75	45	1.4	(0.8, 2.4)	1.9	(0.5, 6.5)
MD only	320	25	15	7	1.3	(0.7, 2.6)	1.5	(0.3, 6.4)
Both PhD and MD	162	14	9	4	1.0		1.0	
Scientist's Years in Current Job								
0 - 10 years	809	86	52	31	1.8	(1.2, 2.8)	1.9	(0.7, 4.9)
11 - 20 years	692	45	25	18	1.1	(0.7, 1.8)	2.3	(0.8, 6.4)
21 or more years	527	31	22	7	1.0		1.0	
Scientist's Rank								
Senior Researcher	1912	127	92	53	0.9	(0.5, 1.7)	1.5	(0.4, 6.0)
Junior or Other Researcher	127	11	8	3	1.0		1.0	
Scientist's Research								
Basic science only	1128	84	55	27	0.9	(0.6, 1.2)	0.8	(0.4, 1.7)
Basic science and clinical	181	19	10	7	1.2	(0.7, 2.1)	1.2	(0.4, 3.6)
Other	120	6	2	2	0.6	(0.2, 1.4)	1.7	(0.2, 13.0)
Clinical only	598	52	32	19	1.0		1.0	
Scientist Proportion of Time Spent on Research								
Less than 25%	81	7	3	3	1.1	(0.5, 2.5)	2.0	(0.4, 10.4)
25-49%	362	28	17	10	1.0	(0.6, 1.6)	1.2	(0.5, 2.9)
50-74%	649	54	33	19	1.1	(0.7, 1.5)	1.1	(0.5, 2.4)
75% or more	947	74	47	24	1.0		1.0	

Table 8. Suspected Misconduct and Type of Suspected Misconduct by Characteristics of the Institution Where it was Observed

	Misconduct				Any vs. None		FF vs. P	
	No Misconduct	Any Misconduct	Fabrication or Falsification	Plagiarism Only	Odds Ratio	95% CI	Odds Ratio	95% CI
Degree Granting Institution								
Yes	1755	138	86	47	0.9	(0.6, 1.5)	0.9	(0.3, 2.5)
No	232	20	12	7	1.0			
Most Departments Offer…								
Doctorate/Professional Degrees	1681	132	83	44	0.9	(0.6, 1.5)	0.8	(0.3, 2.1)
Masters, Undergraduate Degrees	65	4	2	0	0.7	(0.2, 2.2)	0.0	- -
Not Degree Granting	226	19	12	8	1.0		1.0	
Medical School								
Yes	1103	94	61	30	1.2	(0.8, 1.6)	0.8	(0.4, 1.5)
No	883	64	37	24	1.0			
Public or Private								
Public	1128	87	54	30	0.9	(0.7, 1.3)	1.1	(0.5, 2.1)
Private	851	70	44	23	1.0		1.0	
Size of Scientist's Department								
1 – 20	782	60	35	23	0.8	(0.5, 1.3)	1.8	(0.6, 4.9)
21 – 40	575	42	25	17	0.8	(0.5, 1.3)	1.8	(0.6, 5.3)
41 – 60	207	13	11	1	0.7	(0.3, 1.3)	0.2	(0.0, 2.3)
61 – 80	82	11	6	4	1.4	(0.7, 2.9)	1.8	(0.4, 8.4)
81 – 100	56	4	2	1	0.7	(0.2, 2.2)	1.4	(0.1, 17.4)
More than 100	280	27	19	7	1.0		1.0	

The scientist's highest degree, rank, type of research (clinical versus basic), or proportion of time spent on research are not significantly associated with observing suspected misconduct.

Among institutional characteristics (Table 8), none is significantly associated with observing suspected misconduct. Thus, whether one works in a degree granting institution or not, in a doctoral granting program or not, in a medical school or not, or a private institution or not, there is little difference in the propensity to observe suspected misconduct.

Scientists Attitudes and Suggestions

Survey respondents were asked to provide open-ended responses to the following series of questions about research misconduct.

- What are the Best Ways to Detect Research Misconduct?

- What Steps Can a Researcher Take to Prevent or Reduce Research Misconduct in His/Her Group?

- What Can Be Done to Increase the Probability that Suspected Research Misconduct Will Be Reported?

- Under What Conditions Are Researchers Likely to Engage in Research Misconduct?

The answers to these questions were reviewed by coders and classified into a series of categories. The categories were based on what was observed in these responses and did not exist a priori. Each response may be coded as representing up to three categories. Thus a response to the question, "What are the Best Ways to Detect Research Misconduct?" might have mentioned better supervision, open communication, and training and would be coded into the categories: "Supervision/Observation/Oversight/ Responsibility of Pl", "Discuss/Open Communication/Meeting" and "Training/ Education/Clear Policies". Table 9A shows the distribution of all responses to this question. Tables 9B, 9C and 9D show responses to the other three questions.

Table 9A shows that scientists believe that the best way to detect research misconduct is through close supervision of research work and place this responsibility on the principal investigator. Specific tools are reviewing data, reproducing results, and other review, audit, and quality control procedures. Scientists also endorse open communication as a way to detect research misconduct. The 11 categories with at least 100 responses comprise nearly 70 percent of all responses.

Table 9A. What are the Best Ways to Detect Research Misconduct?

	Number	Percent
Supervision/Observation/Oversight/Responsibility of Pl	466	14.3%
Review Data/Controls (Data Specific)	419	12.9%
Discuss/Open Communication/Meeting	284	8.7%
Reproduce Study/Support by Other Methods	272	8.4%
Review (other)/Audits/Evaluations/QC/Investigations	253	7.8%
Interview/Ask Questions/Listen	210	6.4%
Be Involved/Informed/Knowledgeable/Familiar	177	5.4%
Vigilance/Watchful/Aware/Skeptical	154	4.7%
Training/Education/Clear Policies	137	4.2%
Protected Reporting /Anonymous	134	4.1%
Read/Review Documentation (Paper)/Plagiarism	116	3.6%
Good Environment/Low Pressure	85	2.6%
Look for Indicators - Data Too Good/Inconsistency	83	2.5%
Character/Ethical Model	64	2.0%
Work in Teams/Different Groups	54	1.7%
No Secrecy/Knowledge Sharing/Transparency	50	1.5%
Review Methods/Procedures Used	30	0.9%
Accept Negative Data/No Preconceived ideas	29	0.9%
Author Involvement/Signoff	22	0.7%
Who Gets Reward- Funding/Tenure/Publications	14	0.4%
None/Nothing	94	2.9%
Other	52	1.6%
Don't Know	60	1.8%
Total	3257	100.0%

Note: 1849 scientists provided one or more responses.

Table 9B shows that scientists believe that the most important thing that can be done to increase the likelihood of reporting suspected research misconduct is to protect the anonymity of the person making the allegation. However, they also believe that it is important to have a policy in place with training and a system of reporting. In this table, the 12 categories with at least 100 responses comprise over 80 percent of all responses.

Scientists were also asked what a researcher can do to prevent research misconduct in his or her own group and Table 9C shows that the responses are similar to those for the detecting misconduct. The best way they say to prevent misconduct is to review results. They also propose that that good ethical modeling is important and training of researchers and research staff by emphasizing the seriousness of research integrity. In this table, the nine categories with at least 100 responses comprise over 80 percent of total responses.

Finally, Table 9D reports how scientists responded to a question asking what they thought were the conditions that would lead to research misconduct. All of the most prevalent answers talk about pressures including pressures to obtain funding, pressures of career advancement, pressure to publish and to produce results, and pressure to succeed in a competitive environment. The ten categories in this table with at least 100 responses comprise nearly 80 percent of all responses.

Table 9B. What Can Be Done to Increase the Probability that Suspected Research Misconduct Will Be Reported?

	Number	Percent
Protected Reporting /Anonymous	536	19.6%
Training/Education/Emphasize seriousness	297	10.9%
System for Reporting/Someone to Report To	187	6.8%
Clear Policy and Procedures/Guidelines	177	6.5%
Discuss/Open Communication/Meeting/Ask Questions	174	6.4%
Review/Audits/Look for Thing that Don't Fit	135	4.9%
Responsibility Staff/Require Report/Encourage Report	124	4.5%
Character/Ethical Model/Honesty	123	4.5%
Good Environment/Low Pressure	119	4.4%
Scientific/Research Integrity/Threat to Science	85	3.1%
Vigilance/Watchful/Aware/Skeptical	83	3.0%
Penalties/No Tolerance/Clear Consequences	81	3.0%
Discrete Investigation/Fair Treatment of Accused	63	2.3%
No Secrecy/Knowledge Sharing/Transparency	63	2.3%
Supervision/Observation/Monitoring	56	2.0%
Follow Through/Enforce Policy	45	1.6%
Reward Reporting/Beneficial/Supportive	36	1.3%
Reproduce Study	31	1.1%
Work in Teams/Collaborate	26	1.0%
Be Involved/Informed/Knowledgeable/Familiar	25	0.9%
Who Gets Reward- Funding/Tenure/Publications	21	0.8%
Acceptance of Failure/Negative Results/No Blame	20	0.7%
No Malicious Intent of the Accuser	14	0.5%
Author Involvement/Signoff	12	0.4%
None/Nothing	47	1.7%
Other	57	2.1%
Don't Know	96	3.5%
Total	2733	100.0%

Note: 1736 scientists provided one or more responses.

Table 9C. What Steps Can a Researcher Take to Prevent or Reduce Research Misconduct in His/Her Group

	Number	Percent
Review/Audits/Examine	726	18.7%
Discuss/Communication/Meeting/Ask Questions	534	13.7%
Supervision/Monitoring/Close Contact	348	9.0%
Good Model/Ethical Model/Honesty	336	8.7%
Training/Education/Emphasize Seriousness	256	6.6%
Be Involved/Informed/Knowledgeable/Familiar	253	6.5%
Reproduce Study	177	4.6%
Value Quality/Negative Results/No Blame	155	4.0%
Good Environment/Low Pressure	147	3.8%
Vigilance/Watchful/Aware/Skeptical	120	3.1%
Clear Policy /Guidelines/Give Examples	114	2.9%
Penalties/No Tolerance/Clear Consequences	102	2.6%
Scientific/Research Integrity/Threat To Science	97	2.5%
Good Notes/Documentation/Notebook	97	2.5%
Work In Teams/Collaborate	93	2.4%
Indicators- Data Too Good/Inconsistent	47	1.2%
Lab Size/Less Work/Be Reasonable	40	1.0%
No Secrecy/Knowledge Sharing/Transparency	40	1.0%
Responsibility Of Staff/Encourage Reporting	35	0.9%
Investigate Before You Hire/Hire Good Staff	25	0.6%
Good Relationship With Staff/Leadership/Available	21	0.5%
Blind Research/Special Research Design	20	0.5%
Protected Reporting /Anonymous	12	0.3%
System For Reporting/Investigation	11	0.3%
None/Nothing	3	0.1%
Other	65	1.7%
Don't Know	10	0.3%
Total	3884	100.0%

Note: 1907 scientists provided one or more responses.

9D. Under What Conditions Are Researchers Likely to Engage in Research Misconduct?

	Total	
	Number	**Percent**
Pressure For Grants/Funding	626	17.5%
Advancement/Money/Career/Tenure/Promotion	487	13.6%
Pressure For Publication	427	12.0%
Pressure For Results/To Produce	253	7.1%
Competitive/Ambition/Pressure To Succeed	235	6.6%
Pressure (Other)	216	6.1%
Positive/Specific Results Needed	198	5.5%
Poor Supervision/Mentor/Oversight	160	4.5%
Lack Integrity/Dishonest/(Character)	124	3.5%
Ego/Recognition/Fame	120	3.4%
Fear Of Loss Of Job/Job Security	90	2.5%
Personality Disorder/Illness (Mental)	77	2.2%
No Consequences/Low Risk/No Review/Reproduced	76	2.1%
Poor Training/Unclear Guidelines/Ignorance	68	1.9%
Isolation/Solitary/No Sharing	62	1.7%
Poor Environment/Too Lax/Poor Culture	56	1.6%
Uneducated/Youth/No Talent/Inexperienced	40	1.1%
Fear Of Failure/Desperate	32	0.9%
Administration/Institution	25	0.7%
Not Quality/Manipulated/Exaggerate Data	20	0.6%
Cultural Differences/To Obtain Visa	18	0.5%
Accidentally/Error	12	0.3%
None/Nothing	17	0.5%
Other	60	1.7%
Don't Know	69	1.9%
Total	3569	100.0%

Note: 1789 scientists provided one or more responses.

Limitations of this study

The study has several limitations that may have affected the results. As noted previously, the sample only includes one observer per department. While this was done to address a criticism of past studies, it limits the likelihood of capturing all incidents of misconduct in the departments sampled. Thus the numbers of misconduct incidents found in this study is likely to be the floor of any generalized estimate.

Another limitation is that the scientists sampled here are not representative of all persons engaged in the scientific enterprise and who might have opportunity to observe misconduct. In fact this group of NIH funded principal investigators represents an elite group who occupy the top levels of academic departments and research laboratories. Postdoctoral fellows, graduate students and lab technicians might provide a quite different account of the quantity and type of misconduct. Even among this group, only a little over half responded to the questionnaire. Because of the steps taken to protect the identity of the responding scientists, it is impossible to ascertain if the experience of the survey nonrespondents is equivalent to that of survey respondents. In addition, the study is probably more representative of the biomedical, behavioral, and life sciences than it is of the physical and social sciences, which are less likely to be funded by NIH..

Our method of measurement itself may have failed to elicit all misconduct. We are confident that the procedures instituted in this study—probes on the nature of the incident observed and independent review of the incidents with rejection of observations that fail to fit the federal definition of misconduct—have prevented inappropriate reporting or

over-reporting. Likewise it is possible that some observations fall outside the time period specified due to telescoping, that is, by including highly salient events that occurred before the period of interest. However, the questionnaire was careful to specify the period of interest as the past three academic years. It is possible that some researchers report observations to us more than once, which could have occurred because we sent out multiple mailings; and it is possible that in this era of translational research that some observations were reported about someone else's department, even though we specified the study focus as their own department. We have no reason to believe that such occurrences would be at all common.

We must also be careful to distinguish between what a scientist may observe and what is truly misconduct, that is, between a lay and a legal definition of misconduct. In fact our study clearly shows that many scientists are ready to include scientific misbehaviors in their definition of misconduct which do not fulfill the federal definition. Which misbehaviors a scientist might include, the seriousness they attach to those behaviors, and their propensity to report the behaviors to the authorities may vary widely among scientists. A legal determination of misconduct requires a venue for presenting evidence pro and con and explaining what it means in context. How scientists in the field review evidence and make judgments is likely also to vary and to be quite different from the procedures undertaken by institutions and the federal government in adjudicating misconduct cases.

Overview

This study has produced four important findings:

- First, 7.4% of the responding scientists reported observing or having direct evidence of suspected research misconduct occurring in their departments in the previous three years.
- Second, 36% of the incidents of suspected research misconduct were not reported to institutional officials and the reporting of another 4% was uncertain.
- Third, the likelihood that a scientist will observe and report research misconduct increase when the scientist has read the institutional misconduct policy and knows to whom to report an allegation.
- Fourth, scientists provided suggested solutions to detecting and preventing misconduct including audits of research results, better communication among researchers, and closer supervision by those in charge. Also, scientists felt that increased reporting would be facilitated by better protection for those report suspected misconduct.

ESTIMATE ON SIZE OF PROBLEM:

This section was revised based on NIH updated information on April 1, 2008:

> *"We have recently estimated the number of personnel supported on NIH grants to be at least 155,000. The methods used to arrive at this estimate are solid and overcome important weaknesses from earlier estimates. These methods and differences are extensively described in our upcoming report. It is important to note that the counts are based on the personnel reported by the grantee organization. There is no obligation for grantees to report all the personnel on any grant, and it is our opinion that key personnel are under-reported. We don't know how big the underestimate is. "*

Given that our sample was composed of researchers supported by NIH, we extrapolated our findings to the estimated 155,000 scientists supported by NIH and calculated the number of scientists possibly observing incidents of suspected research misconduct. We reasoned that if there were 201 reports made by 2212 scientists in three years (or 67 per year) that in our sample they observed possible misconduct at an incidence of 3% per year in other investigators. Since we wanted to be conservative in our estimate we considered all non responders to have observed zero incidences of possible misconduct. Hence instead of 3% per year we will use 1.5% per year as our incidence of suspected misconduct. Applying 1.5% to 155,000 we find that there likely would be a total of 2335 incidents of possible research misconduct. If we use the study population findings where 58% were reported to institutional officials, we could expect to see 1350 reports of possible research misconduct made to institutions. Whereas, if we look at the proportion who said the incident was not reported, did not answer, or left blank, we can see in the extrapolation that about 1000 observations were not likely to have been reported to an official.

This extrapolation has the following limitations; we are extrapolating from a select population to a larger one and which includes the staff; we may be underestimating the number of observations in a large department because the scientist can only report those within their groups and not the entire department; As a reviewer pointed out to us these two factors may balance each other out. Hence our estimate may be off in either direction.

Comparison to ORI

ORI makes a finding of misconduct, on average, in 12 cases out of 24 investigations per year. In addition, if we examine the reports that institutions make to ORI on their Annual Report we can see that from 1993-2006 that there have been 1,592 allegations per year or on average 114. These two facts give credence to the picture that institutions are under reporting. Since roughly one third of the observations of possible misconduct were not reported to officials we can also see that there is under reporting by individuals. However, since the scientists observations of research misconduct have not been adjudicated, we cannot draw any firm conclusion on how many would be likely to be misconduct.

We see that while potential research misconduct is a rare event – approximately three per 100, it is not as rare as most scientists believe it to be. We think this study provides evidence that the reports to ORI of misconduct are just the tip of the iceberg and that many reports are not being made to institutions and or institutions are not always pursuing the allegation in a manner which the regulations have specified.

CONCLUSIONS

The failure of individuals to report 37- 42% of the suspected research misconduct findings raises concerns about the research environment, the implementation of the PHS Policy on Research Misconduct (42 C.F.R. 93), the protection of whistleblowers, and the self-regulation of science. The responding scientists suggested that the most effective way to increase the probability that suspected research misconduct would be reported is

by providing protection for whistleblowers and permitting anonymous allegations. Other suggestions include providing training and education on the seriousness of research misconduct, creating a system for reporting allegations and identifying a person to make allegations to, and establishing clear policies, procedures, and guidelines. These suggestions are buttressed by the third finding which indicates that scientists who have read the institutional misconduct policy and know to whom an allegation should be made are more likely to observe and report suspected research misconduct.

Our study is unique in that we have asked the scientists to provide details of the incidents of suspected misconduct that they have observed. The fact that a quarter of the observed suspected misconduct incidents were evaluated as not being representative of fabrication, falsification or plagiarism according to the federal definition indicates that some scientists likely regard activities not covered by the federal definition to be misconduct and reported those instances despite our providing the federal definition in the questionnaire. This could mean several things. Perhaps institutions define misconduct more broadly than this study did. Perhaps scientists categorize misconduct to mean any misbehavior that undermines science. It is possible that scientists in reporting a misbehavior may have even known it did not meet the definition and were urging us to pay attention to these problems as well. As we have seen in the research reported by Martinson et al., researchers have self reported many misbehaviors that they themselves do; our analysis indicates that some proportion of scientists believe that these misbehaviors are equivalent to the way they think about misconduct and are as bad as fabrication, falsification or plagiarism. This report confirms that there is awareness by

scientists that there is a degree of misbehaviors by scientists. In the present data, one can say that for every three observations of possible misconduct there was also one observation of misbehavior that was viewed by scientists as on a par with misconduct.

Future Research

Research on research misconduct is a relatively new field. Additional research is needed on the incidence of research misconduct, the causes of research misconduct, and the detection and reporting of research misconduct, the high rate of unsubstantiated allegations, the tolerance for deviance within the research community, whistleblowers, respondents, the implementation of the research misconduct regulation, and the prevention of research misconduct.

This study indicates that suspected research misconduct is being observed throughout the research enterprise at a level that is considerable higher than the reported cases would indicate. The findings question the implementation of the PHS Policies on Research Misconduct (42 C.F.R. 93) by institutions and raise concerns about the willingness of the research community to self-regulate. The findings and many responding scientists suggest that institutions could increase the probability that suspected research misconduct be reported by providing protection for whistleblowers, emphasize the seriousness of research misconduct through training and education, provide a system for reporting that identifies the individuals to whom allegations should be sent, and establish clear policies, procedures and guidelines related to research misconduct and the responsible conduct of research. The responding scientists also suggested that their colleagues could detect and

prevent research misconduct by close contact and supervision of their subordinates, reviewing and examining data, and open communication and discussion.

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APPENDIX A. QUESTIONNAIRE

THE GALLUP ORGANIZATION

Reporting of Suspected Research Misconduct in Biomedical and Behavioral Research

Department of Health and Human Services
Office of Research Integrity

There is NO IDENTIFYING INFORMATION on this survey. Your responses are anonymous. Your participation is voluntary.

After completing the survey, please mail it back to The Gallup Organization in the enclosed postage paid envelope.

Administered by:

THE GALLUP ORGANIZATION

Mailing address: The Gallup Organization
Attn: Survey Processing Center
P.O. Box 2660
Omaha, NE 68103-2660

INSTRUCTIONS

Purpose:

The purpose of this study is to measure the observation and reporting of suspected research misconduct in biomedical and behavioral research. The Office of Research Integrity (ORI) within the U.S. Department of Health and Human Services (DHHS) has contracted with The Gallup Organization to collect this information under OMB #xxx-yyy, expiration xx/yy/zz. Results from the study will help ORI make decisions about areas to emphasize when developing programs to help foster integrity in research. This survey is being sent to a random sample of 5,200 NIH-funded research grantees.

Assurance of Confidentiality:

This survey requests sensitive information about suspected research misconduct. There is no identifying information on this survey; therefore, your responses can never be linked back to you, your department, or your institution or employer. The Gallup Organization and ORI will not seek or get any identifiable information about an individual or institution, or attempt to identify any individual or institution from the responses. If any information becomes inadvertently identified, ORI will take no action affecting any individual or institution based on that information. If an audit or review of the original data becomes necessary, the audit or review will be conducted by personnel not directly employed by ORI and no information about the respondents or their institutions obtained in the audit or review will be used to take any action affecting any individual or institution.

The purpose of the survey is to collect nationwide statistics on the observation and reporting of suspected research misconduct, not to implicate individual researchers. Responses will only be reported in summaries or statistical tables. Your responses are entirely voluntary and you need not answer any question you may wish to skip. If you have any questions or concerns about the anonymity of these data, please contact Gallup's Human Subjects Committee Chairman, Steve O'Brien (steve_obrien@gallup.com).

Returning the Questionnaire:

Mailing instructions for returning the completed questionnaire appear on the last page of the questionnaire.

Questions:

If you have any questions about the study, please call The Gallup Organization toll-free at 1-877-242-5587 and ask for Jim Wells.

INSTITUTION AND DEPARTMENT CHARACTERISTICS

Please answer the following questions about the institution where you are employed. By institution, we mean the entire university or organization that employs you. If you are employed at more than one institution, please answer about the institution you consider your primary employer. Questions that ask about your department refer to your department within your school, center or institute. If you do not work in a department, please answer in terms of your organizational unit that most closely corresponds with an academic department in a university.

MARKING INSTRUCTIONS:
When completing this survey, please mark your responses with an 'x' using a blue or black pen like this example [x]. Do not mark outside of the response area like this example [X].

1 **Are you** employed in a degree granting institution? (Mark [x] one box.)

____ Yes
____ No

2 **In your institution do…** (Mark [x] one box.)

____ Most departments offer a doctorate or professional degree?
____ Most departments offer a masters degree, but not doctoral degree?
____ Most departments offer an undergraduate degree only?
____ I do not work in a degree-granting institution

3 Do you work in a medical school? (Mark [x] one box.)

____ Yes
____ No

4 Is this institution public or private? (Mark [x] one box.)

____ Public
____ Private

5 Including yourself, how many full-time equivalent faculty (or equivalent professionals if you work in a non-academic setting) work in your department? If you are not in a department, please answer for your organizational unit that most closely corresponds to an academic department at a university. (Mark [x] one box.)

____ 0-10
____ 11-20
____ 21-30
____ 31-40
____ 41-50
____ 51-60
____ 61-70
____ 71-80
____ 81-90
____ 91-100
____ More than 100

OBSERVATION AND REPORTING OF SUSPECTED RESEARCH MISCONDUCT

This section asks about suspected research misconduct you have observed by **researchers** in your department or equivalent organizational unit or about which you have other direct evidence. By **researchers** we mean principal investigators, research associates, postdoctoral fellows, research assistants, research nurses/coordinators, lab technicians, graduate, and undergraduate students.

In responding to the questions below, use as your reference point the Federal Research Misconduct Policy, published by the Office of Science and Technology in the White House in December 2000:

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Falsification is manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record.

Fabrication is making up data or results and recording or reporting them.

Plagiarism is the appropriation of another person's ideas, processes, results, or words without giving appropriate credit.

6 In the **PAST THREE ACADEMIC YEARS**, how many times have you observed or had other direct evidence of researchers in your department (or equivalent organizational unit) allegedly committing research misconduct (falsification, fabrication, or plagiarism) in proposing, performing, or reviewing research, or in reporting research results? (Mark [x] one box.)

____ Zero times **(SKIP TO #9, PAGE 5)**
____ One time in the past three academic years **(CONTINUE)**
____ Two times in the past three academic years **(CONTINUE)**
____ Three times in the past three academic years **(CONTINUE)**
____ Four or more times in the past three academic years **(CONTINUE)**

[IF YOU CHECKED ZERO INCIDENTS OF SUSPECTED RESEARCH MISCONDUCT IN #6, SKIP TO #9, PAGE 5]

7 Please provide a brief description of up to three of the most recent incidents of suspected research misconduct in the past three academic years you have observed or had other direct evidence of, without providing any names or identifying information. For example, *"Colleague changed values of a blot test to be more consistent with their hypothesis and published the results."*

Most Recent Observed Incident #1

_____
_____
_____

Next Most Recent Observed Incident #2

_____
_____
_____

Next Most Recent Observed Incident #3

_____
_____
_____

8 Please provide details about incidents of suspected research misconduct that you described in #8. Please provide information about the most recent incident in the first column. If you indicated zero incidents in #6, please skip to #9.

	Incident #1 ▼	**Incident #2** ▼	**Incident #3** ▼
(1) Type of suspected research misconduct you observed/had direct evidence of: (Mark ALL that apply.)			
a. Falsification ……	a. ___	a. ___	a. ___
b. Fabrication …….	b. ___	b. ___	b. ___
c. Plagiarism ……..	c. ___	c. ___	c. ___
(2) Rank or title of the researcher(s) allegedly committing research misconduct (Mark ALL that apply.)			
a. Senior Research Scientist or equivalent	a. ___	a. ___	a. ___
b. Associate Research Scientist or equivalent	b. ___	b. ___	b. ___
c. Assistant Research Scientist or equivalent	c. ___	c. ___	c. ___
d. Professor	d. ___	d. ___	d. ___
e. Associate Professor	e. ___	e. ___	e. ___
f. Assistant Professor	f. ___	f. ___	f. ___
g. Instructor	g. ___	g. ___	g. ___
h. Lecturer	h. ___	h. ___	h. ___
i. Postdoctoral Fellow	i. ___	i. ___	i. ___
j. Research Nurse or Coordinator	j. ___	j. ___	j. ___
k. Lab Technician	k. ___	k. ___	k. ___
l. Graduate Student	l. ___	l. ___	l. ___
m. Other (specify_____)	m. ___	m. ___	m. ___
n. Rank/title not known	n. ___	n. ___	n. ___
(3) How did you become aware of the suspected research misconduct? (Mark [x] one box for each)			
a. I directly observed the suspected research misconduct while it was being committed	a. ___	a. ___	a. ___
b. I observed the products of the suspected research misconduct and could infer who did it with confidence	b. ___	b. ___	b. ___
c. I was told about the suspected research misconduct by someone else, but then observed the misconduct or products of misconduct for myself	c. ___	c. ___	c. ___
d. I did not observe the suspected research misconduct or products of the misconduct, but have other direct evidence.	d. ___	d. ___	d. ___
e. Other (*Specify*)	e. ___	e. ___	e. ___
f. I don't recall	f. ___	f. ___	f. ___
(4) Was the suspected misconduct reported to officials at the institution? (Mark [x] one box for each)			
a. Yes	a. ___	a. ___	a. ___
b. No	b. ___	b. ___	b. ___
c. Don't know	c. ___	c. ___	c. ___
(5) IF YES in #4, was it <u>you</u> who reported the suspected misconduct to officials at the institution? (Mark [x] one box for each)			
a. Yes	a. ___	a. ___	a. ___
b. No	b. ___	b. ___	b. ___

9 Have you read your institution's policy on responding to allegations of research misconduct?

____ Yes
____ No

10 Do you know to whom you should make an allegation of research misconduct at your institution?

____ Yes
____ No

Please answer the following questions concerning factors related to the detection, reporting and prevention of research misconduct.

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____ Other (specify)

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20 What is your age? (Mark [x] one box.)
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____ No

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____ Private

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f. Assistant Professor	f. ___	f. ___	f. ___
g. Instructor	g. ___	g. ___	g. ___
h. Lecturer	h. ___	h. ___	h. ___
i. Postdoctoral Fellow	i. ___	i. ___	i. ___
j. Research Nurse or Coordinator	j. ___	j. ___	j. ___
k. Lab Technician	k. ___	k. ___	k. ___
l. Graduate Student	l. ___	l. ___	l. ___
m. Other (specify_____)	m. ___	m. ___	m. ___
n. Rank/title not known	n. ___	n. ___	n. ___
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b. I observed the products of the suspected research misconduct and could infer who did it with confidence	b. ___	b. ___	b. ___
c. I was told about the suspected research misconduct by someone else, but then observed the misconduct or products of misconduct for myself	c. ___	c. ___	c. ___
d. I did not observe the suspected research misconduct or products of the misconduct, but have other direct evidence.	d. ___	d. ___	d. ___
e. Other (*Specify*)	e. ___	e. ___	e. ___
f. I don't recall	f. ___	f. ___	f. ___
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b. No	b. ___	b. ___	b. ___
c. Don't know	c. ___	c. ___	c. ___
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____ Doctoral degree (Ph.D. or equivalent)
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___ 35-44
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Scientist	Incident Number	Reviewer Status	Type of Misconduct	How Scientist Became Aware	Description of Incident
1	1	Accepted	Unknown	Unknown	
17	1	Accepted	FF	Observed Products	Colleague omitted data points that nullified hypothesis.
21	1	Accepted	P	Directly Observed	Colleague download files from junior faculty grant into his to edit and modify
30	1	Accepted	Unknown	Directly Observed	Misinterpreting data.
32	1	Accepted	FF	Observed Products	I had a post doc who tried to make the data fit the hypothesis - fabricated evidence, falsified data.
47	1	Accepted	FF	Told, then Observed	Colleague duplicated results between three different papers but differently labeled data in each paper.
61	1	Accepted	P	Directly Observed	Colleague appropriately unpublished data from another lab without permission.
71	1	Accepted	FF	Other Direct Evidence	Supposed total synthesis of complex drug from small molecules suspected to be based on a natural product precursor much closer to target molecule.
81	1	Accepted	FF	Told, then Observed	Re-labeling data to correct suspected mistake in switching samples.
99	1	Accepted	P	Told, then Observed	Student plagiarized extensively in a senior research paper.
116	1	Accepted	FF	Directly Observed	Colleague used "photo shop" to eliminate background bands on western blot to make the data look more specific than what they were.
120	1	Accepted	FF	Other Direct Evidence	Using same data in two publications. Was forced to retract one article.
122	1	Accepted	FF	Other Direct Evidence	Grad student forged/falsified data.
186	1	Accepted	FF	Told, then Observed	Colleague ignored data relevant to publication.
191	1	Accepted	FF	Other	Post doc in colleague's lab detected duplication in figures from two prior papers from the same lab. First author returned and it was determined that there was enough ambiguity that the PI contacted the journal to retract one of the two papers. This in
235	1	Accepted	FF	Observed Products	Failure to report all data in a clinical study.
249	1	Accepted	Unknown	Unknown	Student copied paragraphs from published work to write his/her thesis.
250	1	Accepted	Unknown	Told, then Observed	Colleague falsified missing research data.
267	1	Accepted	P	Told, then Observed	Plagiarism in methods section of paper.
271	1	Accepted	FF	Observed Products	Fabrication of clinical pain response data.
293	1	Accepted	P	Other	A senior "colleague" falsely accused of appropriation of another person's ideas. Reported to university committee and exonerated at that time. Plaintiff is a troubled individual with no research achievements to speak of.
300	1	Accepted	P	Told, then Observed	Plagiarism of a long passage from a published article in a newly published article.
316	1	Accepted	FF	Told, then Observed	Data was incorrectly labeled and the same data was published more than once with different labels.

Scientist	Incident Number	Reviewer Status	Type of Misconduct	How Scientist Became Aware	Description of Incident
319	1	Accepted	P	Other Direct Evidence	Colleague used data from another researcher and published it.
320	1	Accepted	P	Told, then Observed	Colleague used another investigator's data in a grant application without permission or inclusion of that investigator on the grant.
326	1	Accepted	FF	Observed Products	My student fabricated data in a lab notebook. She also altered some information in the lab notebook.
328	1	Accepted	FF	Other	Pedigrees in an (name) grant application were falsified. I read about this incident on the (name) website - (name), (name).
331	1	Accepted	FF	Told, then Observed	A post doc changed the numbers in essays in order to "improve" the data.
338	1	Accepted	P	Directly Observed	Using someone else's data and methods expertise in a grant submission.
347	1	Accepted	FF	Other	Colleague misrepresented data in publications in order to support his/her hypothesis - also ignored conflicting results and reported only results that agreed with hypothesis.
379	1	Accepted	P	Told, then Observed	Plagiarism on manuscript that was corrected before submission.
385	1	Accepted	P	Told, then Observed	Student directly used previously published text (one paragraph) in discussion section of his own paper. This incident was caught and corrected in review state and not presented in final published form.
470	1	Accepted	P	Observed Products	PhD candidate - plagiarism of phases from a published review in their dissertation.
472	1	Accepted	Unknown	Unknown	Colleague apparently changed data inappropriately, a thorough and properly conducted investigation concluded that there was carelessness but no misconduct.
487	1	Accepted	FF	Other	Post doc falsified replicates in a published paper - i.e., used duplicates of one experiment and reported it as a separate experiment.
488	1	Accepted	FF	Other Direct Evidence	Interviewer fabricated data for assessments that she had not done.
489	1	Accepted	FF	Observed Products	Colleague dropped subjects from a study in order to obtain significant group differences; these data were published.
495	1	Accepted	P	Told, then Observed	I am a member of the faculty conduct committee. During the past three years we have seen numerous cases of plagiarism and little else. Incident #1 verbatim copying of published work without attribution (extensive text copying).
316	1	Accepted	FF	Told, then Observed	Data was incorrectly labeled and the same data was published more than once with different labels.
504	1	Accepted	P	Other Direct Evidence	Faculty member presented data generated by graduate student of another faculty member as his/her own hypothesis at a conference and in discussion with companies for patent.

Scientist	Incident Number	Reviewer Status	Type of Misconduct	How Scientist Became Aware	Description of Incident
520	1	Accepted	FF	Other Direct Evidence	Colleague's technician was fabricating PCR bands used for genotyping patients.
527	1	Accepted	P	Directly Observed	Plagiarism.
554	1	Accepted	P	Told, then Observed	Plagiarism by graduate student.
558	1	Accepted	P	Observed Products	Individual used another individual's data as his own.
586	1	Accepted	FF	Told, then Observed	Investigator/faculty member admitted to falsifying data submitted on grant application; fabricated results of clinical study.
589	1	Accepted	FF	Told, then Observed	Colleague cheery - picked data to reach a significant difference in results.
593	1	Accepted	FF	Other Direct Evidence	Investigator falsified by performing only one experiment with an "n" of one and altered data to reflect desired result. Investigator was terminated.
603	1	Accepted	FF	Told, then Observed	Student took scanned blot results from another lab, flipped them 180 degrees and used them as his/her own.
621	1	Accepted	P	Told, then Observed	Plagiarism - graduate student prelim exam.
627	1	Accepted	Unknown	Other Direct Evidence	Was asked by my institution to chair a committee evaluating a researcher who was accused of misconduct. Did not observe it.
641	1	Accepted	P	Directly Observed	PhD student submitted two thesis chapters that I am 90% and certain were directly "outsourced."
659	1	Accepted	FF	Observed Products	Undergrad student falsified data and signed participants names to receipts for money. This was uncovered, the data destroyed and appropriate reporting to officials took place.
661	1	Accepted	P	Other	Results reported in a manuscript provided by an investigation who was not credited with the data.
662	1	Accepted	P	Told, then Observed	Two faculty members supported their master's student when he plagiarized significant portions of his thesis.
664	1	Accepted	FF	Told, then Observed	A colleagues graduate student falsified data in immunoblotting experiments and attempted to conceal the falsification by destroying her research notebooks.
672	1	Accepted	FF	Observed Products	I wrote a proposal, submitted it and then the chair of my department was able to take this from me when it was funded with permission. He sought from one of the university vice presidents who wrote a letter for him. At the time I was new faculty so I d
685	1	Accepted	P	Told, then Observed	Plagiarism by post doc.
686	1	Accepted	P	Directly Observed	Plagiarism - clear case where senior internationally recognized scientist repeatedly wrote and spoke (at meetings) "novel" concepts which he did not cite the original authors giving him the concept. No action was taken by the university because he was h

Scientist	Incident Number	Reviewer Status	Type of Misconduct	How Scientist Became Aware	Description of Incident
707	1	Accepted	FF	Other Direct Evidence	Colleague admitted to doctoring figure. Colleague was investigated and sanctioned by institution and NIH.
721	1	Accepted	P	Observed Products	Extensive plagiarism by a foreign post-doc when submitting a draft of a manuscript to me.
726	1	Accepted	FF	Other	Graduate student stole images from technician in another lab and manipulated to falsify number data in his thesis. He was found guilty of research misconduct at the institutional level but his degree was awarded anyway.
776	1	Accepted	FF	Other Direct Evidence	Post doc made up data, paper was retracted.
789	1	Accepted	FF	Told, then Observed	Lab technician was stealing subject fees and then fabricated data so the number of subjects would match the subject payments.
791	1	Accepted	FF	Told, then Observed	Research nurse falsified data on study report forms for a clinical trial.
836	1	Accepted	FF	Other Direct Evidence	Suspected fraud was identified for a post doctoral trainee in my lab by a co-worker.
869	1	Accepted	FF	Observed Products	Falsely took credit for originating a new treatment which they did not.
875	1	Accepted	FF	Directly Observed	Colleague fabricated construction of a plasmid that was supposedly used as a positive control in an experiment. The results were not published.
891	1	Accepted	FF	Other	Colleague discarded data that was inconsistent with his hypothesis and published the result.
906	1	Accepted	FF	Observed Products	Post doctoral student fabricated data in order to hide the fact that the student made a sequence of mistakes during data collection.
915	1	Accepted	FF	Other	Post doc fabricated data on a paper submitted and accepted - I withdrew the accepted paper.
922	1	Accepted	P	Observed Products	Graduate student plagiarized.
937	1	Accepted	FF	Other	Peers could not reproduce faculty members' data.
940	1	Accepted	FF	Told, then Observed	Post doc in neighboring lab falsifying flow cytometry data.
961	1	Accepted	P	Told, then Observed	Graduate student plagiarized portions of his examinations from the Internet.
997	1	Accepted	P	Told, then Observed	A graduate student copied a research proposal and represented it as his own work.
1006	1	Accepted	FF	Directly Observed	Fabrication: individual reported the generation of specific mutants that were non-existent.
1044	1	Accepted	P	Directly Observed	Plagiarism in a grant application. Entire sections of a recent review article were used in a background and significance section. The grant was not submitted.
1096	1	Accepted	FF	Told, then Observed	We cannot find data from an experiment from one of my post docs. Also, blots and PCR results are mislabeled.

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1111	1	Accepted	FF	Told, then Observed	Research assistants falsified recruitment procedures & a recruitment database.
1113	1	Accepted	FF	Told, then Observed	Lab technician fabricated data and encouraged others to do the same.
1142	1	Accepted	FF	Other Direct Evidence	1) Colleague falsely reported work as conducted in progress report to foundation (that wasn't actually done). 2) Same colleague instructed RA to use inaccurate rate ID's to appear that they had received training.
1161	1	Accepted	FF	Told, then Observed	A co investigator on a large, interdisciplinary grant application reported that a postdoctoral fellow in this laboratory falsified data submitted as preliminary data in the grant. As PI of the grant, I submitted supplementary data to correct the application
1174	1	Accepted	FF	Observed Products	Postdoctoral fellow manipulated data to make a figure for a publication and did not use the original data from the lab. It was caught by the PI and corrected before the manuscript was submitted.
1178	1	Accepted	P	Observed Products	Very minor. An inexperienced foreign post doc plagiarized a section of a review article when writing the introduction to a meeting abstract. The copying was caught in the first version of the abstract and eliminated.
1194	1	Accepted	FF	Direct Evidence	Colleague selected desired (or not representational) tissue sections from study of an RNA expression of cellular/membrane proteins.
1207	1	Accepted	P	Told, then Observed	Resident plagiarized excerpts in writing of thesis. Excerpts were from published papers.
1223	1	Accepted	FF	Told, then Observed	Graduate student extensively altered data to fit better with preconceived hypothesis. None of the falsified data were published or used in grant applications.
1227	1	Accepted	Unknown	Observed Products	Proposal included material originally written in another investigator's proposal without attributing the work.
1280	1	Accepted	P	Told, then Observed	Young faculty "used" sections of a colleagues grant proposal in his own application.
1333	1	Accepted	FF	Observed Products	Colleague omitted important controls and the results were interpreted to be significant. I had the experiments repeated several times with appropriate controls. The results showed no significant differences between experimental and control treatments.
1336	1	Accepted	FF	Observed Products	Post doctoral fellow presented same data twice in a manuscript draft, as two separate figures, one being an enlargement of exactly the same two gel lames of the other full ten lane gel view. When confronted first, he told me they were two separate exper
1354	1	Accepted	FF	Other	This happened not in my department, but in my collaborator's lab in the same institution. I became skeptical about the results from the beginning and eventually re-do one of the experiments myself. The postdoc was the questioned and admitted to fabrica

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1386	1	Accepted	FF	Told, then Observed	Post doctoral fellow falsifies data and used data from another individuals as his.
1410	1	Accepted	FF	Other	One of my post doc results cannot be repeated by at least two other personnel in my lab. Fabrication is expected, the post doc has left, the results were never published. However, other possibilities cannot be completely ruled out.
1447	1	Accepted	P	Other Direct Evidence	Colleague included preliminary data in a grant that she did not collect and did so without permission of individual who did collect that data (who was at another institution). This was discovered when the grant was reviewed by the person who owned the d
1448	1	Accepted	P	Observed Products	Colleagues used ideas from a paper without citing it.
1465	1	Accepted	FF	Don't Recall	Data falsification by a postdoctoral fellow.
1467	1	Accepted	FF	Observed Products	Colleague selected assay data that were not consistent with the majority of assays, in order to keep project afloat and secure internal funding.
1481	1	Accepted	FF	Observed Products	Investigator removed animals from a study without valid reason.
1485	1	Accepted	FF	Observed Products	Switched lanes on a gel to give cleaner result.
1490	1	Accepted	Unknown	Other	Colleague presented confusing analysis of "data" favoring colleague's interpretation with no supporting evidence.
1495	1	Accepted	FF	Other	Post doc accused of misleading data interpretation and selective use of controls and data points.
1496	1	Accepted	FF	Directly Observed	Lie on grant application - include investigators without their permission - PI #1.
1516	1	Accepted	FF	Other	I have served on a misconduct panel for a colleague in another department. This individual admitted to falsifying data for a figure (cr) in grant applications.
1532	1	Accepted	FF	Directly Observed	Statements were included in a proposal that had not been done.
1540	1	Accepted	P	Observed Products	Resident plagiarized literature review.
1543	1	Accepted	FF	Observed Products	Including favorable data, withholding unfavorable data.
1553	1	Accepted	P	Other Direct Evidence	A professor started to do research in a given area only after seeing the ideas of a junior investigator.
1559	1	Accepted	P	Directly Observed	Person took a proposal authored by another person and submitted it as his/her own.
1580	1	Accepted	FF	Other	Called to serve on committee investigating faculty member accused of using Photoshop to place control lanes on gel. Controls were not run. Apparently, these allegations were substantiated.
1596	1	Accepted	P	Other	Grad student copied extensive portions of PI's RO1 into their pre doctoral fellowship application.
1609	1	Accepted	P	Observed Products	Plagiarism of parts of a grant application.
1618	1	Accepted	FF	Told, then Observed	Colleague fabricated and published data.

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1648	1	Accepted	P	Told, then Observed	Graduate student plagiarized his mentor's NIH proposal for the student's candidacy proposal.
1653	1	Accepted	P	Told, then Observed	Colleague removed my name as PI after I wrote almost entire grant that was funded. She changed herself to PI and NIH allowed this without contacting the original PI.
1676	1	Accepted	P	Observed Products	A post-doctoral fellow plagiarized sections of other researcher's work and used them in his own grant application.
1688	1	Accepted	FF	Other	One person presented results which appeared too good to be true.
1707	1	Accepted	P	Told, then Observed	Used written material from a review and grant (directly word for word) without indicating the source(s) (student research paper). Student possibly was not aware that this was incorrect/illegal.
1724	1	Accepted	FF	Observed Products	Colleague apparently destroyed records on computer hard drive. His results could never be repeated.
1736	1	Accepted	P	Told, then Observed	Colleague used other's data without informing.
1740	1	Accepted	FF	Observed Products	Colleague manipulated instrument to get data as desired.
1771	1	Accepted	FF	Told, then Observed	Research assistant entered values for a test without conducting the test.
1772	1	Accepted	FF	Other Direct Evidence	A student (ms) came to me and reported that a paper in which he was first author on contained fabricated doctor but his advisor would not be stopped from publishing it.
1790	1	Accepted	FF	Told, then Observed	Colleague knew knockout mice were on a mixed background and used the results that fit the hypothesis.
1847	1	Accepted	P	Unknown	Colleague submitted results of another investigator in grant proposal.
1892	1	Accepted	FF	Told, then Observed	Colleague changed data in notebook to fit hypothesis.
1893	1	Accepted	P	Other	Plagiarism in writing a manuscript, using paragraphs from another published paper.
1918	1	Accepted	P	Observed Products	Colleague copied two paragraphs from an article for a grant NIH application. He did not cite or quote the copied work. I carefully reviewed the copied work to identify plagiarized sections.
1923	1	Accepted	FF	Observed Products	Colleague generated misleading preliminary data for a grant application. The grant was funded.
1927	1	Accepted	P	Observed Products	Colleagues published results of analyses using a methodology proposed by me, without my knowledge and without crediting me or providing coauthorship.
1932	1	Accepted	FF	Other Direct Evidence	One of the technicians in the division was fabricating the results of genotyping experiments.
1933	1	Accepted	FF	Other	A "top" graduate student falsified synthetic results and "made" NMR showing successful synthesis.

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1951	1	Accepted	FF	Told, then Observed	Graduate student altered electrophysiological recording records to suggest that there was a positive result, when in fact there was not.
1953	1	Accepted	FF	Other Direct Evidence	Student changed voting values on flow analyses to fit the hypothesis. Also fabricated # of times done.
1956	1	Accepted	FF	Other	A post doc fabricated data to indicate that a specific clone was behaving as "expected." The fraud was quickly revealed and the post doc was fired.
1966	1	Accepted	FF	Other	I was on a review committee for (name), now a nationally publicized misconduct case. Data were reversed on Excel spreadsheets.
1992	1	Accepted	FF	Observed Products	Researcher used powerpoint software to insert bands into a gel blot test for publication.
2000	1	Accepted	P	Other Direct Evidence	Colleague attempted to publish another's work without giving proper citation. It was caught by the editor who contacted the original researcher.
2025	1	Accepted	FF	Observed Products	Researcher omitted data contrary to hypothesis and published.
2028	1	Accepted	FF	Told, then Observed	Colleague omitted some low values in one group to make preliminary statistically significant for a grant application.
2058	1	Accepted	FF	Other Direct Evidence	Selective data acquisition.
2069	1	Accepted	P	Observed Products	Plagiarism of a book chapter from a grant proposal.
2081	1	Accepted	P	Observed Products	Plagiarism - use of text from an article published previously.
2098	1	Accepted	FF	Observed Products	Colleague completely fabricated the results and published the results and hypothesis in two well reported journals.
2110	1	Accepted	FF	Other Direct Evidence	Post Doc altered data in notebook, this changed the interpretation of the experiments.
2123	1	Accepted	P	Told, then Observed	An assistant professor "lifted" a section of a grant application and inserted it into his own. The colleague from which the section was lifted had been a previous collaborator, but was also on the review committee. The application was removed from the
2146	1	Accepted	P	Observed Products	Fellow used someone else's words without crediting them. This error was pointed out to her by her mentor, and correction was made before final manuscript submitted.
2157	1	Accepted	FF	Other	A researcher well known to the academic world, (1) Modified report of results after given negative feedback. He manipulated amateurs and omitted data results.
2158	1	Accepted	P	Other Direct Evidence	Faculty member used graduate student's data (after she switched labs) in publication without giving appropriate credit (co-authorship).

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2160	1	Accepted	P	Directly Observed	Colleague claimed authorship on manuscript, ideas and words without giving appropriate credit.
2163	1	Accepted	FF	Told, then Observed	Research assistant failed to conduct a test but recorded fabricated values.
2206	1	Accepted	P	Observed Products	Research fellow plagiarized for a review paper.
2210	1	Accepted	FF	Other Direct Evidence	Post doc may have fabricated DNA sequencing results.
71	2	Accepted	FF	Told, then Observed	Implanted surgical materials and inflammatory responses misrepresented in reporting animal study outcomes.
120	2	Accepted	FF	Other Direct Evidence	Same person falsifying data to match hypothesis.
122	2	Accepted	FF	Other	Grad student mixed up strain and did not rectify.
186	2	Accepted	FF	Directly Observed	Colleague reported data not present - specifically - stated control data had been accumulated but that was not the case.
265	2	Accepted	FF	Told, then Observed	Colleagues worked with different substance than reported.
319	2	Accepted	P	Other Direct Evidence	Colleague used ideas from another researcher and used them in a grant proposal.
487	2	Accepted	FF	Told, then Observed	Post doc may have fabricated data published in a paper.
504	2	Accepted	P	Other Direct Evidence	Thesis committee member from another institution used unpublished data from a graduate student at my institution to obtain federal funding for a similar study design.
659	2	Accepted	FF	Told, then Observed	Staff member fabricated data. When discovered, data was destroyed and appropriate reporting occurred.
662	2	Accepted	FF	Directly Observed	The lab head wanted to manufacture (cut & paste) get data to put in a grant.
664	2	Accepted	P	Observed Products	My own student extensively plagiarized the text of another student's dissertation when preparing a manuscript for publication.
672	2	Accepted	FF	Observed Products	A study participant died while involved in another faculty member's study. I was asked to review the entire study. I found several AE/SAE/s that (cr), in my new clearly related to the study (which utilized large doses of methane) but more reported by B
721	2	Accepted	P	Observed Products	Same as #1, same post-doc. (#1 - Extensive plagiarism by a foreign post-doc when submitting a draft of a manuscript to me.)
911	2	Accepted	FF	Told, then Observed	Junior faculty member fabricated data in manuscript submitted to journal. Reviewer knew that the university did not have apparatus, but data was generated for figure in manuscript.
922	2	Accepted	P	Observed Products	Under grad student plagiarized.
978	2	Accepted	FF	Observed Products	A post hoc protocol revision that significantly changed the results.
1006	2	Accepted	P	Observed Products	Plagiarism: senior investigator removed from authorship a key contributor of data for a manuscript that was published.

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1010	2	Accepted	FF	Directly Observed	PI made "overly optimistic" interpretation of data and on final paper, only presented subset analyses that showed difference but made it look like overall study (cr).
1044	2	Accepted	FF	Directly Observed	Mislabeling of experimental samples. The same identical images were used to represent two different conditions. This was caught before publication.
1049	2	Accepted	FF	Told, then Observed	Colleague used specimens without knowledge of PI.
1614	2	Accepted	FF	Observed Products	Colleague substituted a response curve obtained from a control experiment to the real experiment to prove the effect of a ligand.
1648	2	Accepted	P	Directly Observed	Postdoctoral fellow plagiarized from literature while writing a manuscript.
1676	2	Accepted	P	Directly Observed	An associate Professor excerpted sections from other researchers' grants and research protocols and used them in her own grant application.
1724	2	Accepted	FF	Other Direct Evidence	Colleague published two identical blots as separate experimental data.
1740	2	Accepted	FF	Other Direct Evidence	Colleague manipulated data to make them consistent.
1790	2	Accepted	P	Told, then Observed	Colleague visited another institution, participated in a lab meeting where unpublished data was shared and then reproduced the findings and published it ahead of time. We believe that no animal protocol was in place at the time.
1893	2	Accepted	P	Other	Same.
2025	2	Accepted	FF	Observed Products	Researcher omitted data contrary to hypothesis and published.
338	2	Accepted	P	Directly Observed	Using some data/figures in a meeting poster without listing the appropriate sources as authors.
495	2	Accepted	P	Told, then Observed	Incident #2 Ditto.
527	2	Accepted	P	Other	Plagiarism.
855	2	Accepted	FF	Observed Products	Ignoring refs that challenged results and conclusions.
919	2	Accepted	P	Other	Doctoral student plagiarizing a peer's work.
1157	2	Accepted	FF	Other Direct Evidence	Same colleague had nurse "fix" the records so that consents looked appropriate.
1953	2	Accepted	FF	Told, then Observed	Post doc mixed samples and failed to report mixing. Ignored other negative data.
1992	2	Accepted	FF	Observed Products	Researcher manipulated western blot data - shrank a portion (several bands) to artificially line up with desired results.
2219	2	Accepted	P	Told, then Observed	
338	3	Accepted	P	Other Direct Evidence	Taking ideas and text from someone else's grant proposal.
495	3	Accepted	FF	Told, then Observed	Incident #3 - Fabrication of data. Intentional misinterpretation of data.
527	3	Accepted	P	Other	Plagiarism.

Scientist	Incident Number	Reviewer Status	Type of Misconduct	How Scientist Became Aware	Description of Incident
836	3	Accepted	Unknown	Missing	None
919	3	Accepted	P	Other	Doctoral student plagiarizing the literature.
1208	3	Accepted	FF	Observed Products	Often observed: Large NIH research project fails to produce statistically significant treatment effect using the primary analysis proposed in the protocol. Solution: Try another analysis, or interpret non-significant result as demonstrating equivalence
1496	3	Accepted	FF	Other	Lie on grant application; plagiarize other grant applications. PI #3 (different PI from #1 and #2). #4 - Graduate student changed the results in blots/graphs.
1503	3	Accepted	FF	Observed Products	Publication, May 1993.
1953	3	Accepted	FF	Told, then Observed	Missed controls put, did them later, wrote up as done at same time.
1992	3	Accepted	FF	Observed Products	Post doctoral researcher knowingly submitted incorrect data that had been shown to be in error.
2219	3	Accepted	FF	Observed Products	I withdrew as co-pi on a grant because of a job change. The data was subsequently published but with falsified results. I checked the analysis on my copy of the data file, contacted the PI (and first author) who had (cr) from the data set one-third of
6	1	Rejected	P	Told, then Observed	Colleague didn't include a significant contributor to a research project as a coauthor on the publication.
57	1	Rejected	FF	Other Direct Evidence	Research nurse lost consent of patient, then made a new one and signed it.
66	1	Rejected	P	Other Direct Evidence	A graduate student was found to have plagiarized when writing an assignment for an ethics course.
88	1	Rejected	P	Other Direct Evidence	Use the same hypothesis and same procedures to get the same results.
110	1	Rejected	P	Directly Observed	A colleague in my department took my lecture notes for 10 lectures I used to give and handed these out as his own without notifying me. He was not lecturing on this subject matter that previously taught. He never asked permission to use these notes and
155	1	Rejected	FF	Observed Products	Colleague reported more progress in progress report than had been accomplished.
177	1	Rejected	P	Observed Products	A graduate student plagiarized part of an original proposition. This was not part of the graduate student's research. It was to meet an academic requirement. Strictly speaking, this was therefore not research misconduct, it was academic dishonesty.
265	1	Rejected	FF	Observed Products	Colleague published data that wasn't right.
332	1	Rejected	FF	Other Direct Evidence	Colleague falsely accused student of destroying research results and properly to collect insurance.
382	1	Rejected	P	Told, then Observed	First year graduate student plagiarized answer to an exam question. *Note: that this was not in the context of research.

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587	1	Rejected	FF	Told, then Observed	Presenting same results at multiple conferences
596	1	Rejected	FF	Told, then Observed	Researcher reviewed research creativity wrongly according to guidelines for tenure and promotion because they did not want to promote another researcher's career over their own or over their collaborator's.
778	1	Rejected	FF	Directly Observed	A faculty member lied about the severity of a patient's (my wife) condition to get them to join a clinical trial.
803	1	Rejected	FF	Other Direct Evidence	Colleagues inappropriately tracked research participants and were not truthful with the institutional review board when activities were reported to the board.
855	1	Rejected	FF	Observed Products	Ignoring refs that challenged results and conclusions.
864	1	Rejected	FF	Observed Products	Colleague plagiarized text from a funded grant proposal of which he was a co-I and misappropriated data and falsified a citation.
911	1	Rejected	P	Observed Products	Graduate student plagiarism (multiple students provided the same answer "word for word" on a test.)
919	1	Rejected	FF	Told, then Observed	Conflict of interest between investigator's business and research enterprise.
978	1	Rejected	P	Directly Observed	Faculty member listed himself as first rather than an abstract that was entirely the work of a trainee.
1010	1	Rejected	FF	Told, then Observed	PI experimented with new equipment on subordinate in his lab doing two invasive procedures without consent and then forged his lab assistant's signature on consent form four weeks later.
1049	1	Rejected	FF	Told, then Observed	Colleague used specimens without IRB approval.
1059	1	Rejected	FF	Told, then Observed	Colleague forgot to inform co-author about a death that occurred for a manuscript in which mentality rates were calculated.
1060	1	Rejected	FF	Other Direct Evidence	Colleague attempted to use illegal recruiting methods to obtain patients for a clinical research study in order to fulfill enrollment deadlines.
1105	1	Rejected	FF	Observed Products	Failed to retract paper with data proven to be artifact.
1106	1	Rejected	FF	Directly Observed	A colleague failed to publish a retraction after the results in a major paper turned out to be false (due to an error in the mathematical genetics). This conduct does not fit directly under the heading of falsification, but it resembles that.
1157	1	Rejected	FF	Other Direct Evidence	Colleague got consent signed after the procedure.
1205	1	Rejected	P	Observed Products	One of my collaborators claims falsely (in writing) that he did all the work/research in a jointly authored and published paper. This is an incidence of plagiarism of joint intellectual property. For example, authorship order on a jointly authored jour

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1208	1	Rejected	FF	Directly Observed	Investigator proposed in NIH grant application work that he never intended to do. "Once we get the money, a substantial portion can be used to support pilot work for a later grant application."
1319	1	Rejected	FF	Observed Products	Colleague spent a great deal of effort gathering data, which he later realized should have been done differently to be meaningful. Submitted data for publication without discussion their questionable value.
1443	1	Rejected	FF	Other	Colleague used my research materials, and my post docs time, yet did not include me on the resulting publication and did not credit me anywhere in the publication, and claimed the (cr) were his in the publication.
1503	1	Rejected	FF	Observed Products	Publication, November 2003.
1545	1	Rejected	FF	Observed Products	Incompletely analyzed results reported as conclusions in an abstract to a major scientific meeting.
1560	1	Rejected	P	Other Direct Evidence	Student plagiarized in writing a take home exam.
1614	1	Rejected	FF	Observed Products	Colleague duplicated a figure within a paper and also in a separate paper.
1728	1	Rejected	FF	Observed Products	Favorable statistical analysis.
1757	1	Rejected	Unknown	Other Direct Evidence	Asked to discuss confidential document - I refused.
1773	1	Rejected	P	Other	Local author published same data in two different journals and submitted and accepted duplicate findings.
1980	1	Rejected	P	Other	Graduate students plagiarized on coursework.
2139	1	Rejected	P	Told, then Observed	Recycling of funded grants through multiple agencies.
2219	1	Rejected	P	Told, then Observed	I analyzed a data set and (CR) the resulting manuscripts. A prior meeting had established who would do each paper and have first authorship. After the paper was finished and sent to co-authors for review, one demanded to be listed as first author.
47	2	Rejected	P	Told, then Observed	Graduate student plagiarism on an exam.
99	2	Rejected	P	Observed Products	Student plagiarized in a research paper that was part of a course requirement.
110	2	Rejected	P	Told, then Observed	Another professor in a different department used several of my lecture slides from a course I give to use for his grand rounds presentation - he made no prior contact with me to ask permission nor did he acknowledge they were mine.
116	2	Rejected	P	Directly Observed	Colleague breached confidentiality of peer review process and gave to (cr) a privileged communication to a competitor of the author.
235	2	Rejected	FF	Directly Observed	Reporting only post (cr) analysis when original hypotheses was not confirmed in prospective study.

Scientist	Incident Number	Reviewer Status	Type of Misconduct	How Scientist Became Aware	Description of Incident
250	2	Rejected	Unknown	Observed Products	Colleague reported research results without patient knowledge of being in a research study.
596	2	Rejected	FF	Directly Observed	Threats, verbal and written, were made to a junior researcher, by a senior researcher, concerning their research ability and how they would be evaluated for tenure if they did not respond to his requests.
621	2	Rejected	P	Told, then Observed	Plagiarism - graduate student prelim exam.
1105	2	Rejected	Unknown	Directly Observed	Send comments on a grant to PI.
1319	2	Rejected	FF	Told, then Observed	After submitting a research proposal and receiving approval for funding, a colleague's own research results undermined the legitimacy of the proposal, but the results were not reported to the granting agency for fear of losing funding.
1532	2	Rejected	FF	Directly Observed	Misappropriated funds.
1545	2	Rejected	FF	Observed Products	Incompletely analyzed results presented & accepted in a peer reviewed publication.
1553	2	Rejected	P	Directly Observed	A senior scientist applied for a grant with another investigator. The funding was awarded, the other investigators component was praised in the review, but the senior scientist never gave funds to the investigator.
1559	2	Rejected	P	Told, then Observed	PI submitted (and received) supplement on multi-investigator grant without contacting collaborates and then spent all money on his/her project - never told co-investigators that he/she received funds.
1927	2	Rejected	P	Observed Products	Colleague received my assistance writing a grant proposal. Grant was awarded, research conducted, but I have not been named as coauthor or publications resulting from said research.
1980	2	Rejected	P	Other	Same as above. (Above: Graduate students plagiarized on coursework.)
293	2	Rejected	FF	Told, then Observed	A colleague who mistakenly (I think and believe) "pasted" in a control graphh western blot for two separate sds gel figures. Mistake/error picked up on review of journal. Corrected.
836	2	Rejected	Unknown	Missing	None
1208	2	Rejected	FF	Directly Observed	A senior investigator has well known consultant actually draft section on sample size determination for NOH grant application, but the application that went in proposed a smaller feasible sample size in spite of implied reliance on the power analysis des
1496	2	Rejected	FF	Directly Observed	Lie on grant application - proposed to do certain tasks, included supporting investigators but made no attempt to seek or include their participation. PI #2 (different PI from #1).

Scientist	Incident Number	Reviewer Status	Type of Misconduct	How Scientist Became Aware	Description of Incident
1503	2	Rejected	FF	Observed Products	Publication, November 1994.
293	3	Rejected	P	Other Direct Evidence	Patent and inventorship disputes brining in aspects of plagiarism. But not strictly within definition of misconduct, as above.
855	3	Rejected	FF	Observed Products	Ignoring refs that challenged results and conclusions.
1157	3	Rejected	Unknown	Other	Same colleague was involved in release of confidential information to parties when the study patient had not consented.