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Life After Research Misconduct: Punishments and the Pursuit of Second Chances

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Abstract

Research misconduct is a serious violation of a scientific community's ethical standards. Scientists who commit research misconduct typically face corrective actions from employers and funding agencies, as well as significant professional stigma. Unfortunately, there is little systematic data about the post-misconduct career of these guilty parties. Through a review of Office of Research Integrity (ORI) case summaries, I identified a pool of 284 researchers who engaged in research misconduct and were subject to ORI corrective actions. To assess the prevalence of post-misconduct research activities for these scientists, I searched publicly available databases and online resources for evidence of post-misconduct research activities (such as publications and federal research support). The data demonstrate that researchers often receive second chances as researchers, with indicators of post-misconduct research activities identified for 134 (47.18%) of the offending researchers. In addition, those researchers have received more than US$123 million in federal support for their post-misconduct research efforts.

Keywords

research integrity, research misconduct, responsible conduct of research, administrative actions, post-misconduct careers

For more than two decades, studies of wrongdoing in research have sought to identify the various forms such misbehavior can take and to assess the prevalence and causes of unethical research practices. Scholars have identified a series of unprofessional research behaviors that go well beyond the federal definition of research misconduct (fabrication, falsification, and plagiarism, or "FFP"), such as poor recordkeeping, intentionally ignoring research that contradicts one's own work, and failure to obtain informed consent from human research participants (De Vries, Anderson, & Martinson, 2006; DuBois, Yates, & Vasher, 2012). As for the prevalence of unethical research behaviors, a conservative estimate places the number of FFP cases at 2,325 annually, with up to 1,000 of those cases going unreported to appropriate institutional officials (Titus, Wells, & Rhoades, 2008). A systematic review and meta-analysis of survey data reveal that approximately 2% of scientists admit to fabricating, falsifying, or otherwise "cooking" research data, whereas 14% of researchers have observed colleagues engaged in those activities (Fanelli, 2009). Fanelli also reports that 33.7% of scientists admit to participating in questionable research practices beyond fabrication and falsification, whereas 72% have witnessed research misbehavior in others. We also know quite a bit about the factors that lead researchers to engage in misconduct, with studies linking episodes of misconduct to a mix of a researcher's personal or psychological traits and contextual climate factors (Davis, 2003; Davis, Riske-Morris, & Diaz, 2007; Kornfeld, 2012), as well as to careless research practices, inability to cope with research-related stressors (e.g., pressure to publish and secure external funding), and improper oversight (DuBois et al., 2013).

Despite these efforts to understand the nature and frequency of wrongdoing in research, less is known about the consequences of research misconduct (and its associated punishments and professional stigma) for an offending scientist's career. Stern, Casadevall, Steen, and Fang (2014) have analyzed data concerning faculty-level researchers who had publications retracted as a result of research misconduct findings from the U.S. Office of Research Integrity (ORI), and discovered that publication output for these individuals dropped by a median rate of 91.8% whereas National Institutes of Health (NIH) funding to support their research dropped by 70.5%. In addition, Redman and Merz (2013)

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found that publication rates sharply dropped for postdoctoral trainees who were subject to ORI misconduct determinations. Yet, there has been no systematic study of offending scientists' abilities to return to their research efforts after being found guilty of research misconduct.

Consider recent reports of Woo Suk Hwang's attempt to rebuild his career. Once lauded as "the pride of Korea," Hwang lost his position at Seoul National University and was convicted of embezzlement and bioethical violations in 2010 due to misappropriation of research funds and data fabrication in two high-profile embryonic stem cell research reports that were retracted. By 2012, however, Hwang led the Sooam Biotech Research Foundation and its staff of 40 into a new six-story research facility (Normile, 2014; Sample, 2006; Sang-Hun, 2014). Is Dr. Hwang's story unique, or is he representative of a group of researchers who have been able to reestablish post-misconduct scientific careers? If post-misconduct careers in research are possible, how common are these second chances? Who is likely to receive a second chance?

Method

To investigate these questions, I identified a population of researchers who have been found guilty of engaging in research misconduct (specifically, FFP). To do so, I collected ORI annual reports and case summaries, the United States Federal Register, as well as posted notices in the "NIH Guide for Grants and Contracts." All these information sources are publicly available. For a study like this one, these sources provide sufficient details about the specific misconduct cases, including the names of offending researchers, their institutional affiliations and positions held at the time of the misconduct, descriptions of the misconduct (including reference to any affected manuscripts or grants), and the administrative actions imposed on the researcher by ORI in response to the research misconduct. The Carle Foundation Hospital Institutional Review Board (IRB) reviewed this project and determined that it met the criteria for exemption from additional IRB review in accordance with Department of Health and Human Services regulations governing research with human subjects because data collection was limited to publicly available information.

Through a review of those materials, I identified 284 researchers for whom ORI made a determination of research misconduct between April 1992 and February 2016 inclusive. One individual was subject to two separate misconduct determinations by ORI. For data analysis purposes, I classified these researchers into five broad groups based on the positions they held at the time of their misconduct: graduate students, postdoctoral fellows, academic faculty (ranging from ranks from research assistant professor to professor), other research staff with no terminal degree (such as phlebotomists, clinical research coordinators, and laboratory fellows), and other research staff holding a terminal degree (MD or PhD) but not identified as a "postdoctoral fellow" by ORI.

In addition, I cataloged the forms of research misconduct and ORI administrative actions to which each offending scientist was subject. For those administrative actions that were in effect for specified periods of time, I calculated the average length of enforcement, the range of enforcement periods, and standard deviation. Administrative actions include time-specified debarment from receiving subsequent Public Health Service (PHS) funding for research support, institutional supervision of research activities, institutional certification of research data and its sources, as well as submission of corrections or retractions of published articles when necessary to correct the research record (The ORI, 2011). ORI notes that these administrative actions are intended to be remedial in nature rather than punitive, taking into consideration the seriousness of the specific misconduct activities. They serve as an attempt to protect public welfare, promote research integrity, and conserve federal funds that support research activities (PHS Policies on Research Misconduct, 2016).

I then selected three indicators of post-misconduct research activities for those 284 individuals: indexed research publications, evidence of employment in a research or research-related setting based on publicly available institutional websites, and NIH funding for subsequent work. To gather those data, I performed web searches (using basic search terms such as "Investigator Name") to locate information about each individual researcher, such as biographies from departmental websites, published interviews, and social media (such as Facebook, Twitter, and LinkedIn). When social media profiles appeared in web searches, I limited my review to what was publicly available (i.e., what was viewable without logging into the respective social media platform).

I also searched the PubMed database using the researchers' names to identify post-misconduct publications and any accompanying information related to the institutional affiliation(s) held by the offending scientists. Similarly, I searched the NIH "Research Portfolio Online Reporting Tools" (RePORT) database using the researchers' names to find record of post-misconduct NIH funding for projects led by these researchers. In cases where these searches may have identified a researcher with the same name as an offending scientist, I compared publication and grant funding dates, fields of study, and specific research topics. I then cross-referenced this information with the data I collected from ORI annual reports and through the web searches described above to determine whether the manuscript author or principal investigator was the same individual who engaged in research misconduct. In cases where I could not confidently make that determination, I excluded that data from the totals detailed here. I chose to search both

Table 1. ORI Administrative Actions Imposed Due to Research Misconduct.

	PHS debarment	PHS service prohibition	Information source certification	Data certification	Institutional supervision	Article correction or retraction[a]
All researchers (*n* = 284)	152	275	10	68	132	92
Average duration (in years)	3.55	3.36	3.50	2.96	2.88	
SD	1.56	1.30	2.46	1.15	0.70	
Range (in years)	1 to lifetime	1.08 to lifetime	2-10	1-10	1-7	
Graduate student (*n* = 46)	24	43	0	13	21	20
Average duration (years)	3.74	3.43		2.92	3.00	
Postdoctoral fellow (*n* = 59)	31	58	0	16	29	23
Average duration (years)	3.55	3.19		2.75	2.79	
Academic faculty (*n* = 81)	52	80	8	20	26	35
Average duration (years)	4.22	3.98	3.75	3.35	3.08	
Other (terminal degree; *n* = 46)	24	46	2	17	25	17
Average duration (years)	2.90	2.98	2.50	2.65	2.76	
Other (no terminal degree; *n* = 64)	31	59	0	4	33	4
Average duration (years)	3.20	3.05		3.25	2.82	

Note. Three lifetime debarments and prohibitions from PHS service were not included in calculations of mean or standard deviation. ORI = Office of Research Integrity; PHS = Public Health Service.

[a]Article corrections or retractions include both ORI-required corrections and retractions as well as those corrections and retractions already performed and acknowledged in ORI case summaries. These figures refer to the number of individuals from whom corrections and retractions were required, not the number of corrected and retracted articles.

the PubMed and NIH RePORT databases because the population studied here were all supported by NIH funding when they engaged in misconduct. One assumption in this study design is that any subsequent research activity conducted by the offending researchers would be similar enough to their previous work that record of post-misconduct research activities would be indexed in the same databases as their prior research efforts.

Results

In total, ORI made 237 findings of falsification, 155 findings of fabrication, and 25 findings of plagiarism for these 284 individuals. Table 1 summarizes the number of sanctions imposed upon guilty researchers as part of the ORI administrative actions. Where individuals engaged in misconduct at more than one stage in their career, their sanctions have been included in each respective group of which they were a part but were only counted once in the overall total for all researchers (the top row for Table 1). By far, the most common administrative action is a time-limited prohibition from service on PHS advisory boards (e.g., as a grant reviewer), with 275 of the 284 researchers being subject to this action. Only three individuals (a faculty member, a research coordinator, and someone who engaged in research misconduct at multiple stages in his career) received lifetime bans from receiving PHS research funding or serving in an advisory capacity for PHS. The remaining 149 debarred researchers were prohibited from receiving PHS research funding for anywhere between 1 and 10 years, with an average debarment period of 3.55 years. Correction or retraction of published research articles took place in 92 of the 284 cases (32.39%), a total that includes both cases where ORI required corrections or retractions as well as cases in which ORI acknowledged in their case summaries that articles had already been corrected or retracted. I chose to combine mandated corrections or retractions with ORI-acknowledged corrections or retractions with the assumption that ORI's acknowledgment represented the agency's tacit approval of those actions. The average durations of ORI administrative actions were longest for faculty, whose debarment periods, PHS service prohibitions, and institutional supervision periods lasted an average of 4.22 years, 3.98 years, and 3.08 years, respectively.

Table 2 shows the indicators of post-misconduct research activities and the number of researchers for whom those indicators were found in this study. In total, indicators of post-misconduct research was identified for 134 (47.18%) of the 284 researchers. In terms of relative percentages, academic faculty members were the most likely to continue engaging in research after engaging in research misconduct, with indicators found for 54 (66.67%) of the 81 faculty researchers. However, those researchers who lacked a terminal degree and held more ancillary positions (such as research coordinators and lab technicians) were the least likely to have an indicator of post-misconduct research activities, with indicators found for only nine (14.06%) of those 64 individuals. Each indicator selected here was

Table 2. Individuals With Indicators of Post-Misconduct Research Efforts.

	New NIH funding[a]	PubMed-indexed publications	Online report of research employment	Any indicator
All researchers (n = 284)	17 (5.99%)	118 (41.55%)	113 (39.79%)	134 (47.18%)
Graduate student (n = 46)	1 (2.17%)	14 (30.43%)	12 (26.09%)	16 (34.78%)
Postdoctoral fellow (n = 59)	3 (5.08%)	30 (50.85%)	30 (50.85%)	33 (55.93%)
Academic faculty (n = 81)	12 (14.81%)	49 (60.49%)	47 (58.02%)	54 (66.67%)
Other (terminal degree; n = 46)	1 (2.17%)	24 (52.17%)	22 (47.83%)	28 (60.87%)
Other (no terminal degree; n = 64)	1 (1.56%)	5 (7.81%)	8 (12.50%)	9 (14.06%)

Note. NIH = National Institutes of Health; ORI = Office of Research Integrity.
[a]New NIH funding refers to awards for new projects rather than renewal funding for projects already underway at the time of ORI misconduct findings. However, renewal funding for 23 investigators (all academic faculty) has been included as an indicator of a post-misconduct career in the last column of this table.

found for at least one researcher in all five sub-groups of this analysis. PubMed-indexed publications were the most common indicator of post-misconduct research efforts, with publication records found for 118 of the 284 researchers.

I also identified 17 researchers who successfully obtained a total of US$101,239,317 in federal support of 61 new projects after their research misconduct. In addition, 13 researchers continued to receive federal funding for 18 projects that were already underway when their respective misconduct determinations were finalized. In total, 23 scientists (8.19%) received US$123,087,676 in federal support for post-misconduct research between April 1992 and February 2016. For the sake of comparison, this figure is US$4 million more than the total amount awarded by the National Institute of Biomedical Imaging and Bioengineering (NIBIB) and National Institute of Environmental Health Sciences (NIEHS) combined during fiscal year 2015 (NIH, 2012).

Discussion

The data here reveal several items of note. First, research misconduct is not a career-ending event. Not only do researchers receive second chances after engaging in research misconduct, those second chances are quite prevalent. In fact, indicators of post-misconduct research were found for nearly half of all researchers who were found guilty of misconduct by ORI (47.18%, to be precise). Faculty were the most likely researchers to continue their efforts, with evidence of post-misconduct research available for two thirds of that group. For each indicator of post-misconduct research that I selected for this project, faculty led the way in terms of the percentage of group members for whom an indicator could be located. Perhaps unsurprisingly, faculty had far and away the greatest percentage of its members who obtained new NIH funding. The relative success of faculty should come as little surprise. Given their experience and prior integration in their research communities, they likely have more resources at their disposal and are presented with more future research opportunities than other researchers in this study. Those resources are sure to come in handy as offending researchers deal with potentially significant financial and personal costs associated with research misconduct investigation and adjudication processes.

Trends in the data also suggest that the likelihood of engaging in post-misconduct research increases further up the career ladder one has already climbed prior to the misconduct. In terms relative percentages, faculty were nearly twice as likely as graduate students to continue research activities after misconduct. Although postdoctoral fellows and the non-trainees holding a terminal degree were not as likely as faculty to continue participating in research after misconduct, both groups were significantly more likely to do so than graduate students. In other words, the most junior researchers are much less likely to continue in their (relatively young) scientific careers than the senior researchers who are responsible for their mentoring and training. The paucity of second chances among this junior group may be due to the disruption in their training posed by research misconduct events, or it may be the case that graduate students are in a position to willingly leave research behind for good to pursue other careers.

The data also show that indicators of post-misconduct research were especially sparse for those non-trainees who lacked a terminal degree. However, one should hesitate about making conclusions about the prevalence of post-misconduct research activities for members of this group. It may be the case that these individuals are less likely to continue engaging in research activities because their skills are often transferable outside of a research context, or it may also be true that indicators of post-misconduct research are simply harder to find for these individuals. The ORI case summaries typically included a clear description of their respective positions: phlebotomist, nurse, interviewer, research coordinator, research assistant, and others. Although these are positions that are vital to the research enterprise, the efforts of those persons may be more likely to merit acknowledgment

rather than authorship. In addition, such positions are less likely to be highlighted on departmental or lab websites. As a result, indicators of post-misconduct research activities are likely more difficult to locate for members of this group, even if these individuals continue to participate in research after research misconduct.

There are limitations to these findings that must be noted. First, the study was designed to identify the existence of post-misconduct research activities for the individual scientists who were subject to findings of research misconduct and ORI corrective actions. All the researchers studied here committed FFP, but the project does not stratify its results according to type of misconduct. As a result, the data do not indicate whether a particular form of misconduct is more or less damaging to one's future career prospects. Furthermore, the findings presented here may not be relevant to researchers who engage in other forms of unethical research behaviors, such as those "normal misbehaviors" identified by De Vries et al. (2006) or "questionable research behaviors" highlighted by DuBois and colleagues (2012). The study's population was limited to those researchers whose misconduct was publicized via ORI case summaries, so the data do not speak to the post-misconduct research careers of those scientists whose unethical behaviors were never publicly disclosed.

In addition, this study does not speak to the *quality* or *sustainability* of the post-misconduct careers of those scientists. As a result, there is no distinction here between someone who publishes one indexed article 6 months following a misconduct determination and a researcher whose post-misconduct publication record is robust and sustained over time. Similarly, this project does not measure how much time had lapsed between misconduct findings and resumption of research activity, so one should not assume that these individuals were able to immediately restart their careers. This project gives equal weight to all post-misconduct research career paths, from conducting research at a regional medical center to a research support position in a large pharmaceutical company or maintaining one's original position as an endowed chair at a prestigious American university. To make informed judgments about the quality of post-misconduct research careers would require focused interviews with the individuals themselves.

This study focuses on researchers who committed research misconduct while conducting PHS-funded research. Thus, the findings here may be more relevant to researchers in biomedical fields than those who work in other fields, such as the natural or computer sciences. One should not assume that post-misconduct careers in those fields of study are as prevalent as they were for PHS-funded researchers. Along those lines, given that the search for post-misconduct funding and publication records were limited to results from the NIH RePORT and PubMed databases, I did not capture record of post-misconduct activities for researchers who may have continued research in a different discipline, such as in the humanities or social sciences. Although I did not locate any public reports employment in the social sciences or humanities for any of the investigators in this population, the methods employed here may have missed such researchers.

Best Practices

Although this project does not address the question of whether guilty researchers should be afforded such "second chances" at a post-misconduct research career, its findings have relevance for that discussion. With evidence of post-misconduct research activities for nearly half of the researchers studied here, it is clear that research institutions and professional disciplines have not uniformly adopted a "one strike and you're out" policy for research misconduct (specifically, FFP). If research communities are going to allow offending scientists to return to their work—and those individuals are keen to try to continue their research efforts despite extensive personal and professional costs resulting from their misconduct—it would be worthwhile to identify strategies for working with guilty researchers so that they do not become repeat offenders.

Current scholarship in responsible conduct of research (RCR) pedagogy suggests that common approaches RCR training, such as online training modules or classroom-based courses led by research faculty, are ineffective at preventing research misconduct in the first place. This RCR training typically focuses on the nine RCR core areas identified by NIH (2009), including FFP, authorship and publication, and data management practices. Scholars who have studied the effectiveness of RCR training courses have found that although such RCR training increases participants' knowledge of RCR standards, the training does not result in increased ethical decision making for participants (Antes et al., 2010; Plemmons, Brody, & Kalichman, 2006; Powell, Allison, & Kalichman, 2007). As a result, one could reasonably assume that such training programs are also unlikely to reduce recidivism rates if offered to researchers after misconduct has occurred.

Kalichman (2014) proposed that it may be helpful to move RCR training from the classroom and into the research settings themselves (in the field or laboratory, for example), so that thoughtful deliberations about research integrity issues become an everyday activity for each scientist in the research environment. Mumford and colleagues developed and analyzed a sensemaking approach to research ethics training, which emphasized the influence of contextual issues (perceived causes of a given issue, professional codes of conduct, personal and professional goals, and perceived requirements for attaining those goals) and metacognitive reasoning strategies for the ethical decision-making process (Caughron et al., 2011; Kligyte et al., 2008; Mumford et al., 2008). The sensemaking approach to RCR training focuses

on *how* researchers evaluate and act in ethically complex situations rather than simple transfer of knowledge concerning common RCR topics of interest. They report that this sensemaking approach led to increased—and sustained—ethical decision making on the part of trainees (Mumford et al., 2008). Although the effectiveness of these ethics training mechanisms such as those discussed by Kalichman and Mumford et al. have not been studied specifically in relation to researchers who have already engaged in unethical behaviors, their approaches to research ethics training may be viable options for a program designed to work with researchers after misconduct has already occurred.

It is worth noting that there is at least one program already available to researchers who seek help with resuming research activities after dealing with research ethics or compliance issues. With support from the NIH, DuBois and colleagues created the Professionalism and Integrity (P.I.) Program (formerly known as RePAIR), a confidential professional development program for researchers who have engaged in questionable research behaviors (including FFP) or are otherwise struggling with research ethics and compliance issues (Cressey, 2013; DuBois, Chibnall, Tait, & Vander Wal, 2016). The P.I. Program provides participants with an individualized professional development plan and career coaching after they complete a series of assessments to measure participants' "problem-solving styles, professional strengths, stressors, and other factors affecting professional performance" (P.I. Program, Professionalism & Integrity in Research, 2016). Assessment of the P.I. Program is ongoing, though early reports indicate that participants demonstrated better problem-solving skills and research oversight practices, as well as more positive attitudes regarding research compliance (DuBois et al., 2016). If further assessment of the P.I. Program's impact on its participants continues to demonstrate such positive results, the program could serve as a model for future efforts to reintegrate offending researchers into their disciplines while reducing the likelihood of future unethical research behaviors.

Research Agenda

This project demonstrates that more than half of the researchers found guilty of misconduct by ORI seemingly dropped out of research afterward. Stern and colleagues (2014) have shown that those who *did* continue their research efforts saw a sharp decrease in both publication output and subsequent ability to obtain federal funding to support their work. Our understanding of the true impact of research misconduct on a person's career would be enriched through in-depth qualitative interviews with those individuals. Perhaps those former researchers were unable to continue their work because of the stigma associated with research misconduct. Or, perhaps they willingly left research behind to pursue other interests (particularly graduate students already disillusioned by graduate school). Maybe the decreased scholarly output of those researchers who continued their work was the result of constraints placed on their work because of the misconduct, or maybe they actively sought new research positions with different productivity expectations than their pre-misconduct position. Such important nuances can only be discerned through interviews with the researchers themselves.

It is also important to remember that the researchers who commit misconduct are not the only ones affected by their misdeeds, especially when the guilty party is a mentor. When a faculty member loses her funding and/or position because of research misconduct, projects are scrapped, labs are shut down, and trainees often have to seek a fresh start with a new mentor. The burgeoning careers of those graduate students and postdoctoral fellows may be derailed before they have had a chance to flourish, all through no fault of their own. Perhaps there is a stigma associated with being trained in a research group where misconduct took place, even if the trainee was not involved in the misconduct events. At present, we know almost nothing about the impact of research misconduct on such trainees. Likewise, senior co-investigators are negatively impacted by a collaborator's misconduct as their shared research efforts have been poured into fraudulent work that results in lost time and productivity and potentially retracted publications. Yet, there has been no study of the impact of research misconduct on these affected individuals. More scholarship is needed in these areas.

Educational Implications

For those of us who teach RCR, the findings presented here are relevant to how we discuss research misconduct with our students. Clearly, misconduct is not the career-killer one might have expected. As a result, we cannot rely on the threat of punishment as a sufficient deterrent to such activities. Appeals to trainee self-interest ("If you get caught engaging in research misconduct, you could lose your job.") may be a starting point in those conversations, given that more than half of the researchers studied here stopped engaging in research after misconduct. But threats are not enough. As suggested by Caughron et al. (2011), it may be better to emphasize the inherently collaborative and social nature of the research enterprise in RCR training programs, framing misconduct as a direct violation of ethical values that make research possible, such as honesty, transparency, and healthy skepticism.

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