

NSF breaks new ground in reprimanding authors of flawed *Science* paper

By [Jeffrey Mervis](#) Feb. 4, 2016 , 2:00 PM

Retractions of scientific papers are common. But the circumstances surrounding this week's [retraction of a 12-year-old *Science* paper](#), involving research funded by the National Science Foundation (NSF), appear to be highly unusual.

The case highlights the sometimes fraught relationship between journals, researchers, and funding agencies. And it has drawn attention to some apparently rare steps that NSF took against researchers who the agency says engaged in unacceptable research practices—but not misconduct.

The 2004 paper, reporting on a novel method of synthesizing new materials through the use of RNA catalysts, has been investigated by two universities and NSF. In 2013 the NSF Office of Inspector General (OIG), an independent watchdog, found that the three authors, then a graduate student and two biochemistry professors at North Carolina State University in Raleigh, had falsified their results and were guilty of scientific misconduct.

NSF officials overruled that finding in a move that agency observers say is rare. However, [in a May 2015 letter to the researchers](#), NSF said that their actions were “certainly a departure from accepted practices.” And NSF agreed with OIG that the researchers—Lina Gugliotti, Daniel Feldheim, and Bruce Eaton—needed to “clarify the scientific publication record” (by submitting a correction to *Science*) before they could be eligible to apply for NSF grants. That ruling triggered a chain of events that led to today's retraction notice in *Science*.

The case breaks new ground for NSF, say those who follow research misconduct. One novel twist is that the agency meted out a major punishment—ineligibility for NSF funding—despite finding that the researchers weren't guilty of misconduct. The punishment is instead based on NSF's conclusion that the numerous flaws in the paper meant the researchers had violated an agency rule requiring grantees to publish “all significant findings.”

Another new wrinkle was NSF's decision to tell the researchers that submitting a correction to *Science* would be the essential step in restoring their eligibility. In most

cases where NSF finds misconduct, the perpetrators face debarment from federal funding for a fixed amount of time as long as 5 years. (OIG had recommended that the researchers be banned for 3 years from serving as reviewers or consultants to the agency.)

Correction or retraction?

After receiving NSF's letter, the researchers did submit a correction to *Science*, says Marcia McNutt, the journal's editor-in-chief. But the journal decided not to publish it. Instead, McNutt says she opted for a retraction that is carefully worded to conform to the NSF ruling. "The retraction says that [the researchers] submitted a correction to the journal," she explains. "So according to the retraction, the authors have satisfied exactly what NSF asked them to do."

According to McNutt, the 2004 *Science* paper contained far too many flaws to be dealt with in a correction. "Corrections are for honest errors. We don't want to do corrections for truly sloppy science," she told *ScienceInsider*.

McNutt's characterization of the paper is drawn from the NSF investigation, which concluded that the researchers were guilty of "an avoidance of protocols, a failure to meet expected scientific standards, a lack of expertise or training in the field of inquiry, poor oversight of less experienced team members, and the misrepresentation of data on which a conclusion was based. In short... an absence of care, if not sloppiness, and most certainly a departure from accepted practices."

Based on that analysis, McNutt says she decided that a retraction was the only way to remove the stain on the scientific literature. "Now that [NSF's] report is publicly available," she explains, "I didn't want the community to read it and think, 'So this is the type of paper that *Science* publishes?'" The retraction, she says, still allows the scientists to use subsequent papers that they have published to illustrate that their results were sound. Those later papers, McNutt says, is "the basis on which the research should be judged."

McNutt hopes the retraction will also help curb what she sees as a rush-to-publish mentality among scientists that puts staking a claim above scientific rigor. "I'm worried about what will happen if top journals continue to publish flashy results that don't hold

up and that are slapped together and are shaky,” McNutt says. “I would prefer to send the message, ‘Don’t send those papers to this journal.’”

Lack of clarity

Many details in the case remain murky, however, because of federal laws designed to protect the privacy of the researchers under scrutiny. NSF has not acknowledged that the trio is the subject of its investigation, and their names were redacted from NSF documents released to a North Carolina newspaper that has closely followed the case. But several media outlets have identified the researchers, and Feldheim, now a professor at the University of Colorado, Boulder, and Eaton, who recently retired from that university, have publicly blasted NSF over the years for what they feel has been an unwarranted attack on their research. In 2014 they created a short-lived website, StandUp2ScienceBullies.com, to rally community support for their position.

Feldheim and Eaton did not respond to repeated invitations by *ScienceInsider* to talk about their situation. NSF also declined to discuss the case, citing privacy concerns. But McNutt, who discussed the issue with NSF Director France Córdova before deciding to retract the paper, says that NSF knew its ruling was taking it into uncharted waters.

“It sounded to me, when talking to France, that this might be a change in NSF’s attitude,” McNutt says. “I think they want to work more closely with the community to find ways to raise standards.”

McNutt was quick to add that “NSF doesn’t set journal policy. But I think they are looking for greater involvement in the process of maintaining high standards for scientific integrity.”

The case also calls attention to the messy process by which journals try to address errors in the literature, and the difference between a correction and a retraction. Researchers at the University of Alabama, Birmingham, reported this week in *Nature* on their struggle to get journals to correct mistakes in papers they had published; the researchers had discovered many of mistakes simply by reading the articles. In many cases, they reported, it was difficult to get journals to even acknowledge the errors, much less take appropriate action.

“There’s a vacuum of clarity on when an error warrants an erratum versus a retraction, much less an investigation into possible wrongdoing,” says the lead author, biostatistician David Allison. “There are some broad guidelines, but they aren’t very helpful to an editor trying to decide on the proper response.”

Posted in:

- [Scientific Community](#)
DOI: 10.1126/science.aae0313