

An application of Scholarship for Biomedical Communication

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Internet Surveillance of Scientific Misconduct

Nothing creates more buzz than a topic on “data fabrication” at www.mitbbs.com, an online bulletin board run by Chinese students in the United States. A popular space for the exchange of ideas and opinions, this website is visited by more than 10,000 users on any given night. On the 16th of November 2006, a posting appeared in the biology forum at the bulletin board, alleging data manipulation in a microbiology paper published by an all-Taiwanese research group in the October 20th issue of *Cell*, a prestigious journal of cellular and molecular biology. By claiming that “dozens of lanes of Western blotting were copied and pasted,” this posting stirred controversy in the otherwise peaceful forum and ignited intense discussion immediately.

Within hours after the original posting, more than 20,000 people had viewed the discussion thread, making it one of the top 10 topics on the board. By the second day this discussion had created so much heat that it was almost impossible to ignore the accusation. Thousands of replies rushed in during the following several days, most of which were from students and researchers in the biomedical field who were shocked by the allegation. Among them, some became cyber-detectives: they downloaded high-resolution pictures, freely accessible online, and searched through every single lane in the blown-up images for evidence of data manipulation. Through this joint effort, they soon reached the conclusion that the data in several figures were indeed questionable.

The general thought was that action must be taken. By day five, both the research group in Taiwan and the editors at *Cell* had been contacted by the bulletin board posters. Within a month, Chung Hsing University, where the research was conducted, convened an investigation committee that recommended the corresponding author to retract the paper from the journal. The online challenge was soon publicized to the scientific community, as a report showed up in *Science* in December¹. The paper was retracted from *Cell* in January 2007².

Thus, with the aid of the internet, it took less than two months from uncovering suspicious data in a new research article to reaching an official decision by the institution. This timeline was unimaginable in the past, where months and even years passed before an allegation was made, not to mention an official settlement.

In today’s world, information disseminated by the internet reaches the widest audience in a most efficient way. In this case, observations made by a single person became a common concern by thousands of people within hours. Synergy between the global network of minds speeds up the action in search of truth. In addition, anonymity, a key feature of internet use, protects whistle blowers from negative

effects of their own reputation and career development, a likely event if they made the moves within the same institution. Therefore, those who have hard evidence in hand are less restrained from stepping up to make such a sensitive allegation.

The online users want a fair investigation to reveal the truth, not defamation of the group who published the manipulated data. Although some in the forum expressed worry about the tainted reputation of Asian researchers by publicizing the allegation, more insisted that any misconduct in science should not be tolerated, no matter who is doing the research. “It is about what is right and what is wrong,” as one posting puts.

The year 2006 witnessed a chain of scientific misconduct being exposed in the public media. In the most well-known case, Woo Suk Hwang, a South Korean scientist who was not only a pioneer, but a well-respected leader in human embryonic stem cell research, was exposed for manipulating his scientific results published in high-profile journals. In the concluding issue of 2006, *Science* published an article titled “Breakdown of the Year: Scientific Fraud.”³ “The reporting of scientific results is based on trust,” the article says, “...but the shock of the Hwang deception, along with other recent fraud cases, is jolting journals into a new reality.”

A report by scientists and editors on the Hwang case concluded that “operating in an atmosphere of trust is no longer sufficient.” It recommended “substantial stricter requirement for reporting primary data and a risk assessment for accepted papers.” While the journals are taking steps to scrutinize scientific results in the papers as an effort to catch scientific misconduct, the online surveillance will add an additional fence to curb data manipulation.

Reference

1. Online sleuth challenge *Cell* paper. *Science*. 314(5806): 1669
2. Hsu HH, Chung KM, Chen TC, Chang BY. Role of the sigma factor in transcription initiation in the absence of core RNA polymerase. *Cell*. 2006.127(2):317-27. Retraction in: *Cell*. 2007. 128(1):211.
3. Breakdown of the year: Scientific fraud. *Science*. 314(5807): 1853