

Scientific Integrity and Misconduct—Yet Again

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It has been a difficult year for scientific integrity. The problem of scientific misconduct is occupying a disappointingly increasing amount of time in the research world and has reached the lay press. Misconduct requires ever growing vigilance, scrutiny, and at times forensic investigation, on the part of journals, editors, reviewers, readers, misconduct sleuths, and academic institutions.

Periodically, gross malfeasance is discovered. It has happened again in our specialty. A special committee of the Japanese Society of Anesthesiologists (Kobe, Japan) recently found Dr. Hironobu Ueshima, a Japanese anesthesiologist, guilty of fabricating data and other misconduct in 142 publications (12 original papers, 9 case reports, 1 in related fields, and 120 letters).^{1,2} To date, only six of these publications have been retracted. If all the 142 articles are ultimately retracted, Ueshima would become the third anesthesiologist with retractions numbering in the triple digits. He and two other anesthesiologists—Joachim Boldt and Yoshitaka Fujii—would sit atop the Retraction Watch leaderboard. Together they would be the three authors with the most retractions in science worldwide.³ This is an ignominious distinction for both these individuals and our specialty. Perioperative medicine has a dominant presence in scientific misconduct.⁴

Unfortunately, scientific misconduct is proliferating. Last year, worldwide, more than 2,300 articles were retracted, an increase from just 38 in 2000.⁵ This may, in part, represent greater scrutiny and reporting, and it is fortuitous that only four in 10,000 articles overall are retracted.⁶ However the number of problematic if not fraudulent articles is known to be much greater than the number of retractions,⁵ and retracted articles often continue to be read and cited long after their retraction.⁷

A new wrinkle in scholarly publishing is the influence of questionable integrity on systematic reviews and meta-analyses. These articles of synthesis are considered by



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some to be at or near the top of the information hierarchy,⁸ and may have outsized influence on practitioners and patient care. They have also been challenged by others as unnecessary, low-quality, misleading, or conflicted.⁹ Regardless of one's perspective, systematic reviews and meta-analyses can be affected by scientific misconduct and by predatory journals (defined as entities that prioritize self-interest at the expense of scholarship and characterized by false or misleading information, deviation from best editorial and publication practices, a lack of transparency, and/or the use of aggressive and indiscriminate solicitation practices¹⁰). The number of systematic review retractions is increasing worldwide, particularly in China.¹¹

The most common reasons for retraction are fraudulent peer review (authors recommend themselves or close friends using a camouflaged email address so they can write a favorable review of their own manuscript) and unreliable data (ranging from honest error to research misconduct).¹¹ Information from predatory journals is also now being increasingly captured in systematic reviews, and has the potential to warp their results and influence their conclusions.^{12–14} Unfortunately, there are presently no standardized methods or guidelines for the exclusion of information from predatory journals, although some ideas are emerging.^{14,15} In the meantime, authors, reviewers, and readers should remain vigilant for unreliable information in systematic reviews and meta-analyses.

Scientific misconduct has unfortunately become so common that the study of this behavior has evolved into a full-fledged discipline—no longer just a cottage industry. Those now studying it include scientists, sociologists, historians, economists, and even philosophers.¹⁶ The seminal question is, why does scientific misconduct exist? The prevailing theory is the credit economy of science and credit-motivated fraud, or, more philosophically (in terms of Plato), that *thumos* (honor and esteem) replaces *nous* (finding truth).¹⁶ Such

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scientists become motivated primarily by seeking credit, regard, and status in the scientific community, whether intrinsically or through external incentive and reward. Academicians feel pressure by the processes of institutional appointment and promotion, which require publications for jobs, compensation raises, retention, or advancement—even for those whose occupation, skills, and interest are not scholarship but, for example, clinical practice. Institutions themselves may be just as culpable, as they too seek credit, reputation, status, and the financial gains therefrom in terms of extramural funding and donations.¹⁷ As described previously,¹⁸ the pressures of institutional reputation and metrics have spawned an entire ecology of academic misconduct and manipulation.¹⁷ Thus, faculty and institutions are *pari passu* in a perverse mutual reward system that incentivizes misbehavior. Journals, too, have become enmeshed in the thirst for *thumos*, credit, and status, and complicit in the credit economy.^{17,19}

Science is oft said to be self-correcting. Aiding that goal are scientific sleuths such as Elizabeth Bik²⁰ and John Carlisle,²¹ websites such as Retraction Watch^{1,3} and PubPeer,²² reader vigilance, greater recognition of the problem, and changing mores. However, retraction, the standard “remedy” for science needing self-correction, can be slow because individuals, journals, and research institutions often push back on criticism that could lead to retraction and are incentivized to maintain readership and reputation because retractions are a “black mark” to be avoided, journals may fear litigation, and even willing institutions may lack the necessary capabilities to investigate claims of misconduct.^{5,7} Investigators who run afoul of scholarly integrity regulations may hire attorneys to slow the process or grind it to a halt.^{5,23} In addition, or instead, they may simply leave that institution untouched, ahead of being sanctioned, only to resurface elsewhere and begin anew.^{24–26}

ANESTHESIOLOGY did not publish any of the fraudulent articles by Dr. Ueshima and does not need to retract any. This is fortunate. Perhaps we were lucky. Perhaps it is our reputation for integrity and the thoroughness of our peer review process that deters fraudsters from even submitting manuscripts to us,^{27,28} and ideally detects those who do. ANESTHESIOLOGY uses a rigorous and comprehensive peer review process, engaging expert content reviewers and statisticians. That process aims primarily to assist authors and maximally improve the presentation, interpretation, and comprehensibility of manuscripts before publication, and so we publish the very best Trusted Evidence. For this we are grateful to our many reviewers who provide freely of themselves and their time, at *de minimis* or no financial compensation, but as a service to their colleagues, the Journal, the American Society of Anesthesiologists (Schaumburg, Illinois), and the specialty. Even if manuscripts are not ultimately accepted for publication, the ANESTHESIOLOGY peer review process and the feedback provided to authors are helpful to them in their ongoing efforts. ANESTHESIOLOGY

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Competing Interests

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