**Peer-review fraud: infarcting the heart of publication process**

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**Running title:** Peer-review fraud

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**Abstract:**

Peer-review is one of the most important components of the publication process. Journal editors strongly rely on peer reviewers’ comments to decide whether to accept an article for publication. Additionally, peer reviewers provide suggestions to improve the quality of the manuscript. However, in the past few years, several articles were retracted due to compromised peer-review process affecting scientific integrity. Recently, Springer ​retracted 107 articles for similar reasons from Tumor Biology. These cases are alarming and demonstrate a strong need to have a rigorous selection of reviewer and systems to be in place to avoid future scams.

**Keywords**: Fake reviewers, misconduct, publication ethics, retraction, scamPeer-review is one of the most important components of the publication process, which plays a key role in validating the quality of research. The international committee of medical journal editors (ICMJE) defines peer-review as “critical assessment of manuscripts submitted to journals by experts that are usually not part of the editorial staff” (1) Journal editors strongly rely on peer reviewers’ comments to decide whether to accept an article for publication; additionally, peer reviewers provide suggestions to improve the quality of the manuscript. Peer-reviewed papers are used to demonstrate expertise, receive grants, and for academic promotions. These papers also help clinicians in making clinical decisions.

However, if the papers are fraudulent, inaccurate, or poorly reported they not only dilute scientific knowledge but also put patient’s life at risk. A systematic review reported that 2% of authors admitted to have fabricated, modified data or results at least once (2). It may take much longer time to detect such fraud; however, there is no fraud that can never be detected. A famous example of Yoshitaka Fujii, who published more than 170 fraudulent papers since 1991 was detected in 2011 following a special investigation (3,4).

Unfortunately, the peer-review process is not an exception for frauds. Recently, Springer ​retracted 107 articles following their investigation from an oncology journal (Tumor Biology) due to compromised peer-review process affecting scientific integrity (5). The journal stated that "after a thorough investigation we have strong reason to believe that the peer review process was compromised. This retraction note is applicable to the following articles” and listed all 107 articles in the same retraction note (5). Similarly, in the past journals have done such massive retractions, in March 2015 BioMed Central retracted 43 papers (6), in August 2015 Springer retracted 64 papers (7), in November 2016 BioMed Central and Springer ​retracted around 58 articles (8) considering inappropriately influenced and compromised peer-review process. According to retraction watch, till April 21, 2017 around 450 articles were retracted as a result of the compromised peer-review (9). Overall, these cases are alarming and demonstrate a strong need to have a rigorous selection of reviewer and systems to be in place to avoid future scams.

***Fake peer reviewers***

Fake peer reviewers are friends or colleagues of author(s) of submitted paper who agree in advance to provide a favorable review. Few authors may create sham email addresses of non-existing researches/experts, or using real researcher’s names impersonating as real ones. Authors may also agree to peer-review each other’s paper, creating a fake circle of peer reviewers. However, such inappropriate and possibly criminal behavior is unethical.

These fake peer reviewers are outcomes of several intentional or unintentional motives. These include fear of rejection, gaining funding, having no time to write papers and co-ordinate journal’s review-rejection-resubmission-response, pressure to publish for promotion or mandatory university/government rules, and to build ones resume for future positions. We are aware of the famous mythological story “the goose that laid the golden eggs”, similarly for short-term benefits involvement in fraudulent peer reviews or scientific misconduct may put ones’ reputation and long-term but awaited and real benefits at stake.

***Blame game***

Following fraudulent peer-review cases the question arises “who is at fault?”. The journal which allows authors to suggest their own reviewers and do not verify credentials; or the authors who provided sham details impersonating as original reviewers; or the system that does not allow suspicious behavior because of the trust editor has in authors.

***Need for robust system to detect cheating***

With advancing technology, the peer-review process has also advanced to a greater extent from paper review to online review, which also brings several advantages and disadvantages. Online review process is quick time saving and much efficient than paper review, however, it also provides opportunity for scams. A peer-review process completely depends on trust and integrity of authors, reviewers and editors. Given the fact that peer-review frauds are increasing it is important that robust peer-review process is in place and increase awareness of such of misconduct and potential consequences.

To build such system, it is everyone’s responsibility to understand ones’ role and ethical responsibility. There were several ideas put forward to improve peer review, standardizing procedures, providing detailed feedback to reviewers, rewarding reviewers, being more rigorous in selecting and deselecting reviewers, and creating professional review agencies (10). The ICMJE states that “it is the responsibility of the journal to ensure that systems are in place for selection of appropriate reviewers.” It also states that “reviewers must disclose to editors any conflicts of interest that could bias their opinions of the manuscript, and should recuse themselves from reviewing specific manuscripts if the potential for bias exists” (1).

***Vigilance before damage***

Though, no one would like to be in fraudulent situations, such instances are not under one’s control. The best way could be eternal vigilance. Several journals request, sometimes mandatory, authors to provide preferred or non-preferred reviewers who authors think are expert in this field and would be the best people to review their manuscript. The term preferred has inherent bias and requesting author to provide preferred or non-preferred reviewers theoretically brings bias in this process. Hence, it is best to avoid suggested/preferred reviewers as far as possible.

However, sometimes could be very difficult to find relevant experts in the field, where the editor is bound to depend on these suggested reviewers. In such cases, ask authors to provide institutional email addresses of these reviewers along with generic emails like Gmail or Yahoo, and use both to invite them for review. Also check names, email addresses of all suggested reviewers and validate them using their recent publications. It may also happen that the suggested reviewers may already be reviewing papers for a particular journal which makes it easy to validate and help to detect signals of scientific misconduct. The WAME supports the use of Open Researcher and Contributor ID (ORCID) and encourages authors to register with ORCID and to include their ORCID number on their professional documents, such as vitae and Web sites. WAME also encourages journals, publishers, and other service providers to use ORCID which in turn may help control peer-review fraud (11).

Verify the email address with an internet protocol (IP) address route trace. The IP address is an identifier of a computer or device on a transmission control protocol (TCP)/IP network. The IP address can be static or dynamic and written using four numbers separated by periods. The static is a permanent IP address and dynamic is a temporary address. Such IP route tracer is important to identify if the author and the reviewers are the same, if a single device is being used by both. However, the limitation of IP tracer is that, it may not detect if the author is using different devices from different locations to fool the system.

Additionally, journals need to update author instructions stating that, if a journal suspects potential misconduct compromising peer-review process it may conduct detailed investigation and if proven the author(s) will be blacklisted from publishing in the same journal and may publish investigation report. During submission, the author should confirm this as a disclosure to abide by the rules. This also makes authors accountable in case of deviation.

***Impact of fraudulent papers***

It may not be always possible that, the editor will be able to identify the potential fraud concerning peer-review, and unfortunately such papers are published and until detected such papers may have diluted the science. Such fraudulent publications may not just dilute scientific knowledge, but also put patient’s life at risk where clinical judgments are based on such research. Scientific publications are trusted by researchers, scientific community and clinicians directly/indirectly influencing treatment options. Several other researchers/authors may use these fraudulent papers to plan their future research which may again end up into unreliable results and wasting valuable resources. Authors may also use significant data from these fraudulent papers (to compare or draw conclusions from their research) and cite them in their paper. It also wastes valuable time of the resources to contribute to such paper. It is clear that once the fraudulent paper is published it is very difficult to overcome from the damage that had done.

***Solutions after publication***

There may not be a single solution to handle peer-review fraud.

*Contact author(s) and institution*

The first step would be to contact corresponding author requesting clarification or additional information. Explain author about the situation and possible consequences if such unethical behavior was intentional, if not ask for an explanation. It is also important to contact his/her institution and update them about the unethical behavior of this author and request them to investigate from their end. Follow-up with both author(s) and institution(s) to a possible extent, and if no action is taken or reply not received editor may consider retraction of concerned paper.

*Retraction*

The COPE states that “journal editors should consider retracting a publication if they have clear evidence that the findings are unreliable, either as a result of misconduct (e.g. data fabrication) or honest error (e.g. miscalculation or experimental error)” (12). Compromised peer review is a serious scientific misconduct and retraction would be ethical to minimize harmful effects from misleading publications and link them wherever possible. The purpose of retraction may not be to punish authors who misbehave, but to correct the scientific literature and to ensure scientific integrity.

*Re-review*

Fraudulent papers with compromised peer review may not be as bad as a publication with fraudulent data. However, the harmful effects from such misleading publications may vary from paper to paper. Editors may consider re-reviewing these papers and wish to publish such report/expression of concern linking as much as possible with original papers.

*Investigate other papers*

The Editor/journal may also consider investigating previous papers from this author to confirm if similar misconduct has not been part of these papers. If the investigation confirms peer-review fraud, editors may wish to contact editors of other journals to conduct full investigation.

In conclusion, the best way to handle or stop peer-review fraud is eternal vigilance. Though we could create systems to reduce opportunity to play around the peer-review process and scams, but the peer review will continue to operate on trust and integrity.

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