5GH Foundation

Some Comments on the "Future of Research Integrity"

A friend of ours is about to attend the 'R2R 2025 Conference' in London and has asked us to share some thoughts on 'the future of academic integrity' for the attendees. This is a great opportunity for us to express our stance and the direction we are working towards.

(1) Should individuals who identify and report problematic research receive more recognition or rewards? If so, what form could that take?

The academic sleuths, who identify and report problematic research practices, are not only vital contributors to the scientific community, but also essential contributors to the society as a whole. Their contributions should be recognized and acknowledged by our human society.

Today, academic sleuths have various platforms to share their findings, such as PubPeer, media outlets, personal social media, and personal websites. And there are awards recognizing significant contributions to maintain integrity in our scientific community, like the Einstein Foundation Individual Award given to Dr. Elisabeth BIK in 2024. Thanks to these platforms and the awards, we recognize the individuals who fight against the academic misconducts for the good of our society, and they help us remember the notable figures among them.

However, academic sleuths deserve more recognition for their contributions, including but not limited to promotions and financial support, both of which are currently lacking in the traditional academic career path. Nowadays, academic system heavily relies on metrics like numbers of publications and citations, to evaluate the researcher, especially the researchers at their early career. The contributions of identifying problematic research practices weights ZERO in this system, which discourages young researchers from pursuing careers as academic sleuths.

It is time to start talking about a metric to evaluate the academic sleuths about their contributions in identifying problematic research practices, a metric can be used to assess their work when they are being considered for promotion and funding. While any metric has its limitations, an open discussion on this matter could bring significant benefits to our scientific community.

(2) Looking ahead to the next three years, what threats to research integrity worry you most?

The development of technologies, especially the artificial intelligence (AI) technologies, must be one of the most cited answers when this question is posed to the scientific community. It may be true that the development of technologies will allow the fabricated content, such as spectra and data, more difficult to be detected. Dr. YANG Mu with Columbia University has identified tens, if not hundreds, of hand-drawn and/or photoshopped spectra since the summer in 2024. Her task will become much more challenging if authors use more sophisticated methods to fabricate their spectra with new technologies. Indeed, the 5GH Team is working with our allies looking for strategies, which I can not disclose details at current stage, to fabricate false spectra, in the hope of identifying key features that can be used to detect them.

Other forms of research misconduct are also likely to evolve with the advent of new technologies. Plagiarism is no longer limited to copy-pasting, tortured phrases are no longer necessary. Sentences, paragraphs, and even entire articles can be rephrased and reorganized using generative AI tools like ChatGPT and DeepSeek. False questionnaires or statistical tables no longer need to be manually filled out. Data with specific characteristics can be automatically generated. Under these circumstances, the strategies we previously used to detect false content may no longer be effective. We can no longer simply rely on examining the last digits to determine if a statistical table is fabricated.

I am not able to tell how vulnerable our system, specifically the academic publishing industry, is in the face of these challenges. Several studies warn our scientific community about the capabilities of the generative AI tools to fabricate false content. However, it remains unclear whether journals can prevent such content from being published and whether we can detect it once it is published.

It is worrisome, but it does not worry us most. Instead, the lack of academic sleuths as well as the barriers to publish null and/or negative results pose a more significant threat to our scientific community. The number of academic sleuths remains low in the globe. Young researchers are not encouraged to pursue careers in this field, funding is not allocated into related areas, including "Research on Research". As a result, technological innovations lag behind the efforts to combat misconduct.

The publishing industry exacerbates these issues. Although several journals will accept articles with null and/or negative results, the quality control in these journals is often substandard. And these journals primarily focus on medicines and biology, leaving null and/or negative results in other disciplines, like material science and chemistry, mostly unpublished.

The publication bias weakens our ability to detect unusual patterns in the articles with false results.

(3) What steps do you think researchers, institutions, and publishers need to take to improve research integrity?

Recently, academic sleuths are mainly independent individuals. They receive little to no support from their institutions, and the institutions they report to. Generally, institutions respond extremely slowly to the reports from academic sleuths. For example, Sun Yat-Sen University, a top university in China, was reported one and a half years ago that several directors of the university hospitals got involved in academic misconducts, including images reuse and manipulation, takes no action until recently. Shanghai Jiaotong University, another top university in China, was reported years ago that one professor got involved in massive misconduct cases, including reusing images and violations of human experimentation ethics, also takes no action until now. Hubei University was report one year ago that two students in the university sold their data. Although the university promised to open an investigation, there is not update since then.

In addition to taking reports from academic sleuths seriously, institutions should form their own integrity teams and provide team members with the necessary resources, including training programs, technical support, and financial funding. Alternatively, funding agencies and government authorities should also take on this responsibility.

Publishers and journals should establish a more transparent publishing industry, which will help in detecting misconducts. Since 2024, the 5GH Team and our allies have identified over 1,000 cases of "editor-author conflict of interest". These cases involve journal editorial members act as the handling editors for the articles from their frequent coauthors (Edit-for-Pal), or for the articles of their own (Edit-for-Themselves). These conflicts were primarily discovered because the information of the handling editor was openly disclosed. Dr. M. A. Oviedo-Garcia with Universidad de Sevilla has uncovered large number of problematic review practices from the open review reports.

On the other hand, keeping information closed will make detecting misconducts more difficult. For a long time, the scientific community has been aware that many reviewers ask or even force the authors to cite their own articles. Since the review reports are usually unpublished, the academic sleuths have to take great effort to analysis the citation patterns in order to identify potential problematic reviewers. Meanwhile, lacking detailed information in the publishers' notes allows the individuals involved in misconducts to evade detection. You may remember the case where a group of Chinese authors were forced to cite 13 articles from the

two reviewers, stating that "*As strongly requested by the reviewers, here we cite some references [[35], [36], [37], [38], [39], [40], [41], [42], [43], [44], [45], [46], [47]] although they are completely irrelevant to the present work*". An source, which I can not disclose in details, suggests that [redacted]. Since the publisher does not disclose details of them in the retraction note, their names remain unknown to the public, and the fact that [redacted] is hidden.

What is more concerning, publishers are stepping back regarding to the transparency. Some Elsevier titles no longer disclose the information about the handling editor since 2025. A mandatory guideline about the publication transparency is in urgent need.

Besides the institutions and the publishers, other parties, especially the legislative and judicial authorities in the globe, should also take their role to strengthen the research integrity. Except for some laws in the United States and a few other countries, legislation to punish academic misconducts is still lacking in many parts of the world. Additionally, prohibition on selling authorship remains a contentious issue, because laws uphold the right of individuals to transfer their intellectual property. As a result, authorship-for-sale advertisements are widespread on Chinese social medias like RedNote. The 5GH Team obtained a contract from a seller, indicating that some of such advertisements offer authorship along with linguistic assistance. Service providers such as RedNote and Facebook show no willing to remove these advertisements, as they are not illegal under current laws, the laws needed to be revisited.

(4) How do you think research integrity is likely to evolve in the next few years?

Academic misconduct is often seen as the dark counterpart to science, fueled by advanced technologies. We cannot envision a bright future without immediate and coordinated action among the key stakeholders.
