Austin Critical Care Case Reports

Open Access

Austin Publishing Group

Editorial

A Commentary on the Importance of Ethics in Scientific Research

Haque ME[1], Parvin MS[2,3]* and Akhter F[2]
[1]North Dakota University System, USA
[2]Bangladesh Agricultural Research Institute, Gazipur, Bangladesh
[3]Leibniz University Hannover, Germany

***Corresponding author:** Most Shanaj Parvin, Bangladesh Agricultural Research Institute, Gazipur, Bangladesh

Received: December 17, 2021; **Accepted:** January 12, 2022; **Published:** January 19, 2022

Editorial

Ethics refers to a set of rules or a system of moral principles to differentiate the right from the wrong, as like the golden rules (don't lie, don't steal, and don't cheat) that we have learned in social settings including at home, at school, and other religious places (Church, Mosque, Temple). This also defines norms of conduct that distinguish acceptable behaviors from unacceptable behaviors. In another way "Ethics is accepted behavior pattern in society" and "To be ethical means to follow the law". There are several reasons why ethics is crucial in scientific research; in this commentary we would illustrate more detail on scientific misconduct, its pitfalls, and crucial aspects of ethics.

First and foremost, ethics promote the aims of scientific research include knowledge, truth, and avoidance of error. Any kind of deviation of ethics in scientific research may result in research misconduct included falsification, fabrications, and plagiarism. Researchers are involved in research misconduct as a result of departmental pressure to publish their work in high-quality journals. For instance, young faculty are mainly inclined to increase the number of publications for their academic career or to overcome the tenure years, thus creating pressure to graduate students or post-docs which often results in research misconduct. However, the act of reckless manipulation of research materials, equipment, process, omission of data or research results not an accurate presentation in the research notebook, generation of fake authors and affiliations, and disguise authorship just to cite own paper to increase own citation metrics which falls under the definition of falsification. Other activities like random insertion of paragraphs, making up data, manipulation of statistical results, changed labeling in electron microscopy images, charts, and graphs from other publications to increase the number of publications or to escalate h-index or citations which falls under the core definition of fabrication [1]. A published article often retracted even after decades to avoid error. As such, Massachusetts Institute of Technology (MIT) cancer researcher retracted a highly cited paper (277 times) a decade after publication in "Cancer Cell" because of error in figures, defined as "inadvertent sloppiness" [2].

Furthermore, other malpractices like appropriation of another person's ideas, results, and words-without proper citation or credit are defined as plagiarism. Plagiarism is no more an honest mistake rather identified as a misdeed which is completely unacceptable to the scientific world. There are several ways to manage plagiarism, such as paraphrasing while reading any scientific article, keeping some notes if possible, mentioning proper citations/sources of scientific papers, and use of reference management software (Endnote/Mendeley). The researcher often cites review paper rather than paying attention to the original research article, which is unacceptable. Before citing any research article, good ethical practice is read and comprehends the literature; need to consider primary literature which contains the specific discoveries, literature that agrees or disagrees with the author point-of-view and multiple points-of-view, and to ensure authentic "self-citation" where the subject matter aligned with the point-of-view. These sorts of practices would help to become a good citizen of science [3]. As of now, the application of various scientific tools like plagiarism checker/detector software makes scientific contributions more authentic and pragmatic which we never thought of before. The researcher should have the ambition to publish their hard work to a reputed journal, but the culture of ambitious plan or move towards a goal with an unrealistic ill motive or manipulation of manuscripts which is entirely unethical. The Office of Research Integrity (ORI) analysis report demonstrated that the researcher involved in research misconduct to achieve a higher position in career, to achieve research grant, and to obtain scientific reward or recognition. Thus, researchers need to be cautious to keep away from academic/research misconduct.

Second, ethics is an indispensable part while research needs collaborations; synergizing resources among various disciplines and institutions, networking via annual meetings or conferences facilitates clear communication between countries to achieve a common goal, involves groups with different expertise, and sharing knowledge. Thus, ethical standard promotes the values that are inevitable for collaborative work included accountability, fairness, trust, and mutual respect. For instance, the Pfizer-BioNTech COVID-19 vaccine was developed by German Biotechnology Company BioNTech and its developmental collaboration with American company Pfizer for facilitating clinical trial, logistics, and manufacturing. Similarly, the Moderna vaccine was developed in Cambridge, Massachusetts, and funded by the National Institute of Allergy and Infectious Disease (NIAID). Bayh-Dole Act (1980) created an open platform for many universities (federally funded laboratories) to collaborate with the private sector/industry, thus developing marketable innovations via leveraging U.S. investment in fundamental research into a far stronger engine for commercialization, giving universities right to the IPR generated from federal funding. Scientists deserve to achieve credit for their contributions, they do not wish that their ideas be disclosed or hijacked prematurely. Thus, intellectual property rights through copyright and patenting policies facilitate encouraging collaborations via the data sharing policies and confidentiality

Citation: Haque ME, Parvin MS and Akhter F. A Commentary on the Importance of Ethics in Scientific Research. Austin Crit Care Case Rep. 2022; 6(1): 1035.

[4]. Ethical norms help the researcher to follow the guidelines for authorship, such as who will be the first author (a person who is the principal investigator of the assigned project or a major scientific contributor in the experiment; lab bench work, writing, and data analysis), the second author (be involved in a meaningful way in the side experiment but not a lot of writing), middle author relative same to the second author, and last or responsible/corresponding author for funding compliance. All authors need to have an intellectual scientific contribution, as such a technician need not be considered as an author because the person is getting paid for the position. If there is an equal scientific contribution of authors, in that case, both authors will be a co-first author. Similarly, if there is a compliance issue then both authors would be co-last authors or corresponding authors. Before submitting any manuscripts, authors need to agree that there is no conflict of interest. If there is any conflict of interest, the principal investigator/research supervisor needs to settle the issue, but often this is not the case. For instance, international faculty who appointed as a research supervisor often puts their name as "first and corresponding author" in the first report of a pathogen, which belongs to the origin of conflict of interest. Here I would like to mention some examples of these kinds of articles such as;

"First Report of Leaf Blight of Sugar Beet (*Beta vulgaris*) Caused by *Sclerotinia sclerotiorum* in Minnesota, U.S.A." by Khan et al. [5].

"First Report of *Pythium ultimum* causing Damping-Off of Sugar Beet (*Beta vulgaris*) in Montana, U.S.A" by Khan et al. [6].

"Morphological and Molecular characterization of *Sclerotinia sclerotiorum* on Sugar Beet in Montana, USA" by Khan et al. [7].

"First Report of *Fusarium equiseti* causing Seedling Death on Sugar Beet in Minnesota, USA" by Khan et al. [8].

"First Report of *Sclerotinia sclerotiorum* causing Leaf Blight in Sugar Beet (*Beta vulgaris* L.) in North Dakota, USA" by Khan et al. [9].

"First Report of *Geotrichum candidum* causing Postharvest Rot of Sugar Beet (*Beta vulgaris*) Roots in Minnesota and North Dakota" by Khan et al. [10].

"First Report of Alternaria Leaf Spot Caused by *Alternaria tenuissima* on Sugar Beet (*Beta vulgaris*) in Minnesota, U.S.A" by Khan et al. [10].

In these articles, senior professor snatched the first authorship, deprived Ph.D. level graduate students. The second author supposed to be the first author, and research supervisor supposed to be the corresponding author since financial compliances belongs to him. Although graduate students assigned to the research projects, worked as like an independent scientist for pathogen detection using molecular tools, contributed significantly in the experiment; lab bench and greenhouse work, sequence data analysis *via* NCBI blast and Finch TV package, and wrote the literatures. Furthermore, there were some unwanted inclusion of third, fourth and fifth authors who never contributed significantly in those researches (Anonymous). Journals often do not define the role of each author, thus ambitious researchers/professors often took the advantage of the situation to flourish their own scientific recognition to achieve bigger research grants. And an Editor-in-Chief often does not like to pay heed to the internal fact of the authorship because this is not their business. Another notable incident, the same first author (Khan et al.) included his own daughter name as first author in graduate student research where Dr. Khan was the last and corresponding author. Indeed, we came to know this fact from his own graduate student ("Anonymous" who supposed to be the first author, according to his point-of-view) who told the dark side of the story.

"Efficacy and safety of generic azoxystrobin at controlling *Rhizoctonia solani*" by Atiya et al.

These shows unethical practices in science, when it is inevitable to strictly follow the ethical norms in academic environment. Graduate students often do not have the courage to make conflict with supervisor because they badly need recommendation letter for a job application. Some graduate students often drop out from school as a consequence of conflict with research supervisor. Though American or European Professor does not have the culture of stealing student's first authorship for their own personal interest to achieve scientific recognition (Anonymous interviewee).

Third, ethics in scientific research makes researchers accountable to the public. For instance, ethical norms help our understanding of the use of animals and humans in research, compliance, and responsibility, federal policies on research, and conflicts of interest which are crucial for research scientists who are funded by federal money would be held accountable to the public.

Fourth, many of the ethical norms in scientific research help to develop public support. If people gained confidence over the quality and integrity of research, then more funding to be ensured for research projects.

Ethical deviation in scientific research can significantly harm humans and animals, federal funding in research, researcher, students, and all the affiliated stakeholders. For instance, if a medical scientist fabricates research data in clinical trials of drugs that may kill patients or a researcher fails to follow regulations and guidelines relating to radiation or biological safety that may cause DNA mutation of patients. This may jeopardize public health safety for other staff or students.

Ethical principles in scientific research are discussed below:

Honesty: As known "honesty is the best policy" this proverb is also true in scientific research. Researchers have to be cautious while reporting data, results, and methods to the scientific community. Three unacceptable acts included falsification, fabrication, and plagiarism in publication can bring a bad impact on academic, professional, and social life. As a consequence of the research misconduct, several punishments can be bestowed to the affiliated researcher as we learned from case studies of Office of Research Integrity (ORI) such as published papers can be retracted from the journals, three to five years debarment from professional activities, signing to voluntary exclusion agreement from contracting or subcontracting with any government agency like Health Human Services, and debarment from any advisory committee of Public Health Services, board and peer review committee or any consultant position (https://ori.hhs.gov/content/case_summary).

Carefulness: Scientific research needs good and clear record

keeping of research activities such as data collection, and analysis. The researcher should avoid careless errors and negligence while publishing research in journals. Before sending the manuscript to a journal, researchers need to check the several issues of the journal, whether their work fits in that journal or not. Many research articles often rejected without entering into the peer review process which is pretty frustrating. For example, "Lipid" journal would not accept manuscripts on the use of natural products or active molecules or 100% clinical treatment-related strategy [11]. Research studies demonstrated that multiple times rejected paper often gets more citations when the literature gets published even in low impact factor journals (Ref.). The reason is likely to be acquired repeated revision by a number of peer-reviewers.

Objectivity: Researcher needs to avoid biases in data analysis, data interpretation, peer-review, designing experiments, grant writing, number of replications in an experiment, and other aspects of research where objectivity is required. Non-confirmatory or negative results often are not less important as like the positive results which are hypothesis-driven research. To encourage the negative findings in research a journal named "Journal of Negative Results in Biomedicine" has been launched in 2002. This helps the scientific community to learn in depth from the negative results, the possible pitfalls if the data published.

Integrity: Scientific research needs promises and agreements, consistency of thoughts, and sincere actions.

Openness: Researchers have to be open-minded to constructive criticism and new ideas, sharing data, results, tools, and resources among their peers.

Transparency: Researcher needs to disclose methods, materials, assumptions, analyses, and other information while needed to evaluate the research.

Accountability: Researchers need to provide an explanation or justification of the part of the research they are assigned to perform to the public.

Intellectual Property: The researcher needs to follow IPR while publishing any data, requires prior approval of the principal investigator or head of the department to publish any results and methods. Other forms of IPR such as patents and copyrights rules need to follow. Research work should have the proper acknowledgment of all collaborators or credit who does what during the regional scientific meeting or an annual meeting presentation.

Confidentiality: Researcher must have the sense to protect confidential information such as patient's records, unpublished data while preparing manuscripts, and grants application.

Responsible publication: Researcher needs to avoid duplicate publication, and not to advance publication only for their career rather advances research.

Non-Discrimination: Researcher needs to avoid discrimination against colleagues or students based on sex, race, ethnicity, or related scientific competence and integrity. Ethical norms help researchers to respect colleagues and treat them fairly.

Animal Care: Researchers have to care while using the animal in research, need to avoid unnecessary or poorly designed animal experiments. Research involving live vertebrate animals (except for humans) must be approved in advance by the Institutional Animal Care and Use Committee (IACUC).

Human subject's protection: While pursuing research on humans, the researcher needs to consider minimum harm and risk and maximize benefits. Research involving human participants may require approval of the Institutional Review Board (IRB). Need to maintain privacy, dignity, and autonomy. Another important aspect is to take special precautions with vulnerable populations and distribute the benefits of research fairly.

Competence: Researchers need to improve their own professional competence and expertise through lifelong education and training to promote competence in science.

Social responsibility: Researchers need to prevent social harm through research, public education, and advocacy.

Responsible mentoring: Researchers help to educate, mentoring, and advice students to promote their welfare and give them the freedom to make their decisions.

Legality: Ethical norms allow the researcher to know and obey institutional and governmental policies.

Ethical peer-review: To protect the integrity of the peer-review process, several prestigious journals ask authors to provide the institutional email address of the potential reviewers and to avoid Hotmail, Rediffmail, Yahoo, or Gmail accounts. For instance, Authors are required to provide the name of four reviewers at the time of manuscripts submission in the "Lipids" journal. Thus, ethically behaving scientist gets the freedom to choose the experts in their field and this ensure a fair review process [12,13].

In the end, we would say "if there is a lack of ethics, there would-be no-good practice of science", "if there is a lack of science; there would be no authentic publications".

References

1. Murphy EJ. Scientific Misconduct and *Lipids*: A View from an Editor-in-Chief. *Lipids*. 2012; 48: 1-2.
2. Watnick Randolph S, Cheng Y-N, Rangarajan A, Ince Tan A, Weinberg Robert A. Ras Modulates Myc Activity to Repress Thrombospondin-1 Expression and Increase Tumor Angiogenesis. Cancer cell. 2013; 23: 129-129.
3. Murphy EJ. Citations: The Rules They Didn't Teach You. *Lipids*. 2011; 46: 307-309.
4. Fins JJ. Deep Brain Stimulation, Free Markets and the Scientific Commons: Is it time to Revisit the Bayh-Dole Act of 1980? Neuromodulation (Malden, Mass.). 2010; 13: 153-159.
5. Khan MFR, Haque M, Bhuiyan MZR, Hakk Liu Y. First Report of *Pythium ultimum* causing Damping-Off of Sugar Beet (*Beta vulgaris*) in Montana, U.S.A. 2021.
6. Khan MFR, Bhuiyan. Morphological and Molecular Characterization of *Sclerotinia sclerotiorum* on Sugar Beet in Montana, USA. 2021.
7. Khan MFR, Bhuiyan MZR, Poudel RS, Gross T, Hakk P, Liu Y. First Report of Leaf Blight of Sugar Beet (*Beta vulgaris*) Caused by *Sclerotinia sclerotiorum* in Minnesota, U.S.A. 2021.
8. Khan MFR, Liu Y, Bhuiyan MZR, Hakk P. First Report of *Fusarium equiseti* Causing Seedling Death on Sugar Beet in Minnesota, USA. 2021.
9. Khan MFR, Haque ME, Bloomquist M, Bhuiyan MZR, Brueggeman R, Zhong

S, et al. First Report of Alternaria Leaf Spot Caused by *Alternaria tenuissima* on Sugar Beet (*Beta vulgaris*) in Minnesota, USA. Plant Disease. 2020; 104: 580-580.

10. Khan MFR, Haque ME, Brueggeman R, Zhong S, Bhuiyan MZR, Poudel RS, et al. First report of *Geotrichum candidum* causing postharvest rot of sugar beet (*Beta vulgaris*) roots in Minnesota and North Dakota. Plant Disease. 2019: 103.

11. Murphy EJ. So You Want to Publish in *Lipids*: Tips for Authors to Enhance Their Potential for Success. *Lipids*. 2017; 52: 383-384.

12. Murphy EJ. The Importance of Ethical Peer-Review: Why Do We Ask Authors to Suggest Reviewers Anyway? *Lipids*. 2015; 50: 1165-1166.

13. Khan MF, Bhuyian MZR, Chittem K, Shahoveisi F, Haque ME, Liu Y, et al. First Report of *Sclerotinia sclerotiorum* causing Leaf Blight in Sugar Beet (*Beta vulgaris* L.) in North Dakota, USA. Plant Dis. 2020; 104: 1258-1258.