

1. Why did you choose this paper from the Retraction Watch website?

Since the beginning of COVID-19, I have seen the followers on my Instagram account post their opinions on conspiracy theories regarding COVID-19 being a hoax, unreliability and ineffectiveness of the vaccines, and stories about how science has gone wrong in the past. I have taken the responsibility to share my resources to the people who have been skeptical towards the healthcare system and scientific community in Canada and globally, to educate them with verified and credible facts. I chose the article, *5G Technology and induction of coronavirus in skin cells* by Fioranelli et al., that was retracted from the *Journal of Biological Regulators and Homeostatic Agents*, because it was a recent paper about COVID-19, and the title seemed dubious. I wondered how it passed the peer review process with such a bold claim and why the journal did not scrutinize this paper vigorously. Being a strong advocate for scientific research, especially through my social media and in front of my family and friends, I want to be able to see what makes people question scientific credibility and papers like these are perfect to critically analyze and reflect upon.

2. What was the main finding or take-home message from the paper that made it novel?

The paper proposes that the waves in 5G technology can spontaneously create coronavirus in skin cells. It specifically states that millimeter waves from 5G technology can be taken up by dermatologic cells, acting as an antennae and travel through the cell membrane, to the nucleus to interact with the DNA and form RNAs of coronavirus (Fioranelli et al. 2020). In addition, the title of the paper, *5G Technology and induction of coronavirus in skin cells*, sparked a lot of attention as it was published in a peer-reviewed journal listed on PubMed, and as a result made the main findings appear credible (Bik, 2020).

3. What caused this paper retracted? Provide all details here.

After the paper was first published in the journal, *Journal of Biological Regulators and Homeostatic Agents*, it initiated a lot of conversations on social media such as Twitter, Reddit and internet blogs such as *Science Integrity Digest* and *ExtremeTech*. Scientists began to question the credibility of the journal itself. Elisabeth Bik, a scientist and microbiome and science integrity consultant, who is the founder of the blog, *Science Integrity Digest*, called the paper the “worst” paper of 2020 and scrutinized the paper in her blog (Bik, 2020). Retraction Watch also called on the journal regarding this paper as the title itself sparked many controversial conversations all over the internet. Initially, at the beginning of July 2020 after such scrutiny from the internet, the publishers of the paper, BioLife removed the paper from their website and withdrew it from PubMed, without an explanation (Marcus, 2020). Later that month, the publishers responded to Retraction Watch stating that the Editor-in-Chief, Pio Conti, requested to retract the paper because they had found evidence of manipulation of peer review. The journal mentioned that this could have happened because they received many papers during that time and the paper may have “slip through the net” (Oransky, 2020a).

4. How do you think could this paper have prevented its retraction?

I believe it would have been difficult for this paper to have prevented its retraction; however, some details could have been modified so that the information did not spread false claims. It has a materials and methods section, which describes the mechanism of 5G waves causing coronavirus, but no data had been collected. The article is called an editorial piece but uses words such as “in this research” and “our result show”, however, no experiment was performed. As it is an editorial piece, the authors should have refrained from using words that suggested that experiments were conducted, as it is misleading. There should have been a disclaimer at the beginning of this paper letting the readers know that the information in the paper have not been validated using experimental design or statistical significance. Since no experiment was conducted, the title of the paper should not have falsely associated 5G technology with induction of coronavirus on skin cells. To summarize, I believe if the authors of the paper did not use misleading words, changed the title of their paper and had been transparent about the fact that the information in the paper are opinions, the paper could have prevented its retraction.

5.Can you discern a motivation for the misconduct (if there was any present)?

I believe the motivation for the misconduct was to get accepted by a journal by using novel and bold claims. The authors of the paper found an opportunity to write about two topics that was receiving a lot of attention at the time, COVID-19 and 5G technology, and wanted to use that to their benefit for fame and reputation. In addition, the first two authors Massimo Fioranelli, and Alireza Sepehri, have published other papers together that have been retracted from PubMed, such as *A Black Hole at the Center of Earth Plays the Role of the Biggest System of Telecommunication for Connecting DNAs, Dark DNAs and Molecules of Water on 4+N-Dimensional Manifold* (Fioranelli et al., 2019). Most of their papers have similar styles, focusing on topics that generate a lot of coverage and discussions, and thus showing that their motivation is fame and attention (Bik, 2020).

6.Give an example of a retraction that demonstrated integrity. Provide details.

Nathan Georgette, when he was 16 years old and in high school, published his first paper titled, *The Quantification Of The Effects Of Changes In Population Parameters On The Herd Immunity Threshold*, in a peer reviewed journal, *Internet Journal of Epidemiology* in 2007. He had published another paper based on the information from his first paper, in 2009, in the journal *PLoS ONE*, titled, *Predicting the Herd Immunity Threshold during an Outbreak: A Recursive Approach*. In 2012, when he was an undergraduate student at Harvard University, upon more thorough review of his previous publications and taking a course, in *Ordinary and Partial Differential Equations*, he realized that his paper in *PLoS ONE* had mathematical flaws and requested the journal to retract his paper. The retraction notice of the paper stated that an important step that was needed to perform the mathematical models in the paper was based on incorrect assumptions. *PLoS ONE* retracted his paper. The peer review process was not able to catch the flaws in Nathan's mathematical model, but it was pointed out by him. Although he was a young researcher just starting out his scientific career, he was able to recognize his own errors and be honest (Oransky, 2012). Thus, his story is a great example of a retraction that demonstrated integrity.

7.What have been the benefits and costs of having retraction Watch available to the scientific community and public?

Retraction Watch has been able to catalogue more than 20,000 retracted items including papers and conferences since the 1970s (Vuong, 2020). Prior to this, around early 2000s, annually, only 40 papers were retracted. However, since the launch of Retraction Watch in 2010, journals across the world now retract 1500 articles annually (Oransky, 2020). Not only does the site provide a comprehensive list of papers and conferences retracted, but it also provides reasons for retraction, is easy to digest by a lay audience, covers interviews with journals and authors, follows the events leading up to and after the retraction and highlights the fact that the scientific community work together to correct and police itself (Brainard & You, 2018). It also breaks the misconception that journals that charges fees and research funded by big pharmaceutical companies, are not responsible for majority of retractions (Oransky, 2020). However, retraction whether it be due to scientific misconduct such as plagiarism, manipulation of data, or honest errors can elicit a permanent doubt and mistrust from the scientific community and public on the researchers involved and the journal the papers are published in. In addition, there has been a high prevalence of retractions in countries such as USA, China and Japan that produce a high volume of articles (Vuong, 2020). As a lot of public funds go towards research, the prevalence of the high numbers can cause mistrust in the scientific community. Furthermore, although Retraction Watch indicates papers that are making corrections or revising the retracted papers, they do not comprehensively track them. This can leave behind doubt and confusion to the readers as they might not be able to comprehend what to do with that information (Brainard & You, 2018).

Resources:

- Fioranelli, M., Sepehri, A., Roccia, M., Jafferany, M., Olisova, O. Y., Lomonosov, K. M., & Lotti, T. (2020). RETRACTED: 5G Technology and induction of coronavirus in skin cells. *Journal of biological regulators and homeostatic agents*, 10.23812/20-269-E-4. Advance online publication. <https://doi.org/10.23812/20-269-E-4> (Retraction published *J Biol Regul Homeost Agents*. 2020 Jul 16;34(4):)
- Brainard, J., & You, J. (2018). What a massive database of retracted papers reveals about science publishing's 'death penalty'. *Science* (American Association for the Advancement of Science). <https://doi.org/10.1126/science.aav8384>
- Bik, E (2020, July 23) Worst paper of 2020? 5G and Coronavirus induction [Blog post]. Retrieved from <https://scienceintegritydigest.com/2020/07/23/worst-paper-of-2020-5g-and-coronavirus-induction/>
- Fioranelli, M., Sepehri, A., Roccia, M. G., Linda, C., Rossi, C., Vojvodic, P., Lotti, J., Barygina, V., Vojvodic, A., Wollina, U., Tirant, M., Thuong, N. V., & Lotti, T. (2019). RETRACTED: A Black Hole at the Center of Earth Plays the Role of the Biggest System of Telecommunication for Connecting DNAs, Dark DNAs and Molecules of Water on 4+N Dimensional Manifold. *Open Access Macedonian Journal of Medical Sciences*, 7(18), 3073–3080. <https://doi.org/10.3889/oamjms.2019.776>
- Marcus, A. (2020, July 26). Paper blaming COVID-19 on 5G technology withdrawn [Blog post]. Retrieved from <https://retractionwatch.com/2020/07/26/paper-blaming-covid-19-on-5g-technology-withdrawn/>
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- Oransky, I. (2020, August 3). Ten takeaways from ten years at Retraction Watch [Blog post]. Retrieved from <https://retractionwatch.com/2020/08/03/ten-takeaways-from-ten-years-at-retraction-watch/>
- Vuong, Q. (2020). The limitations of retraction notices and the heroic acts of authors who correct the scholarly record: An analysis of retractions of papers published from 1975 to 2019. *Learned Publishing*, 33(2), 119–130. <https://doi.org/10.1002/leap.1282>