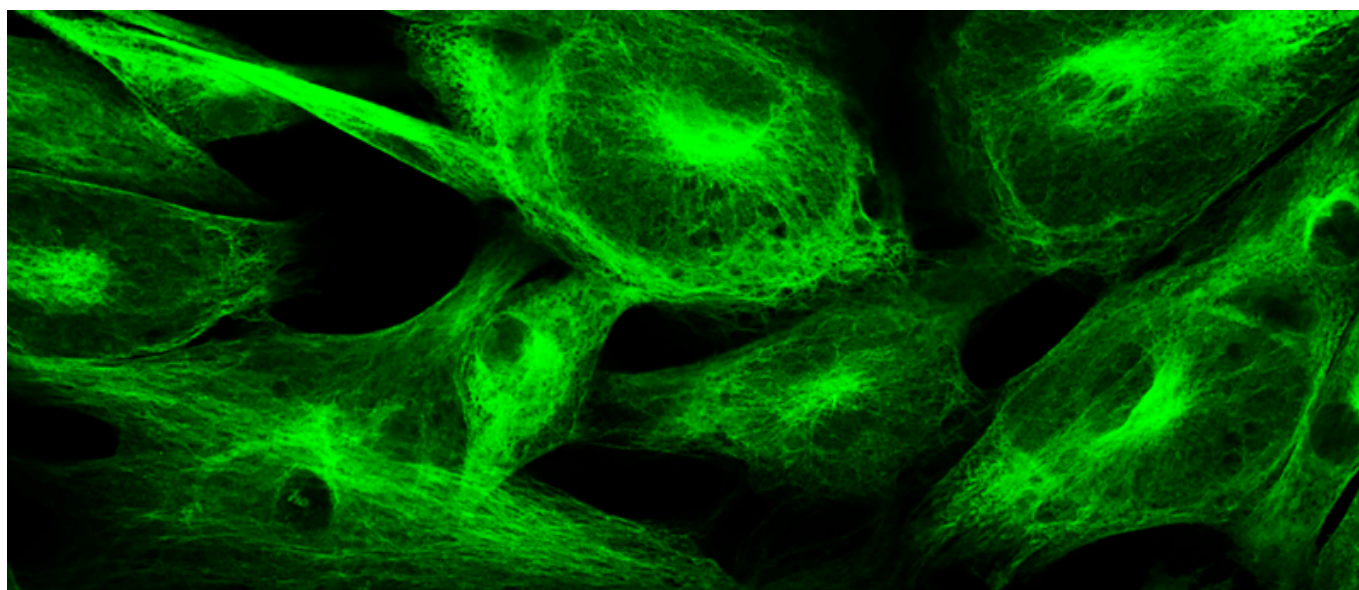




How does image integrity impact scientific research?

23 MAR 2023 | WRITTEN BY DROR KOLODKIN-GAL

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Research suggests that some of the most common reasons for publication retraction are concerns or issues with data and duplication, which could be caused by inaccurate or manipulated images. Here, Dror Kolodkin-Gal, co-founder of the automated image integrity detection software **Proofig** (Rehovot, Israel), explains why researchers should focus on image integrity in a similar way to plagiarism checks.

While the scientific research community is aware that there can be issues with image manipulation and duplication, this can occur surprisingly frequently. If researchers have published multiple papers with several images, it is likely that some of these published papers contain some form of image issues.

Consequences of image manipulation

Image integrity issues can go unnoticed because it is difficult to manually review all the images in an article; however, the



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Many researchers will write grant requests to gain funding for their projects, but if grant authorities find an image manipulation that the researcher failed to detect before submission, it is likely that the request will be denied and the researcher will struggle to access funding elsewhere, thereby halting their research.

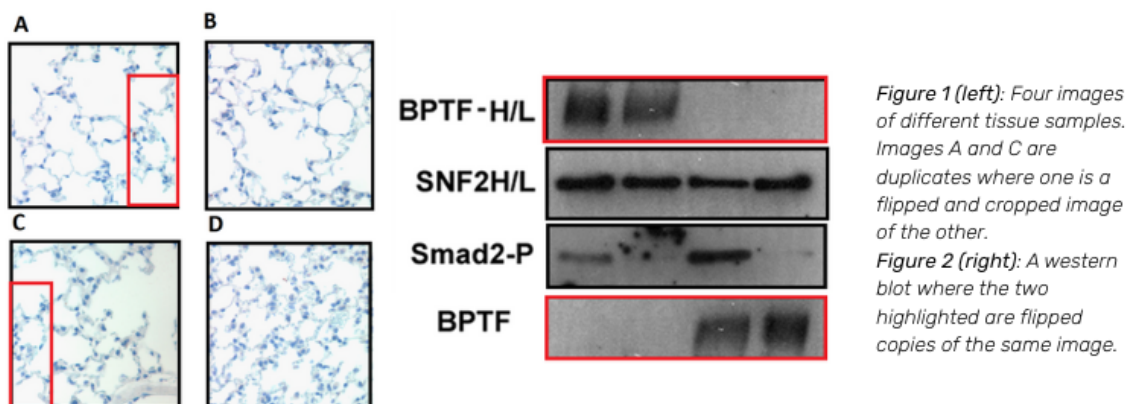
Similarly, if a researcher does gain funding to conduct their research, but submits for publication without detecting mistakes, they risk rejection. Considering that publishers do not have to disclose the reason for rejection, this makes it difficult to improve the likelihood of publishing their paper in the future.

When reviewing research articles, publishers will also check images manually. The lack of accuracy means that some papers might be published with image manipulations and duplications, which can cause costly issues in the future in two ways. Firstly, if the original paper contains inaccurate data, any data in subsequent research based on this will also be incorrect. Secondly, any researchers basing their experimental procedures on an existing paper that contains errors will struggle to replicate the results in the original, leading to wasted time, materials and funding.

If someone detects an issue post-publication and reports it, the publisher must open an [investigation](#) to determine if the allegation is true and, if so, how the issue occurred. Investigations can take up to 2 years, putting pressure on the researcher and significantly reducing their chances of winning funding, conducting research or publishing elsewhere.

Where images go wrong

There are many forms of image integrity issues. Image duplication refers to reusing the same image in different parts of the paper without specifying. The image may be used the same way twice, or may have been altered, for example by changing the rotation, size or scale. The image may have also been flipped or cropped during duplication.



As well as duplicating the image in the same article, researchers might, intentionally or unintentionally, self-plagiarise and use an image from an older piece of research. This can happen when a large paper is split into two smaller publications.

Usually, it is not the intention of the researcher to include images with these issues. Hundreds to thousands of images can be collected when conducting research over many years, and research can be collaborative, with scientists from different universities working on the same project. If these images are not properly managed, it can be difficult to identify and flag any image issues before submitting papers for publication.

Solving the problem

Instead of relying on manually checking images, which is time consuming and inaccurate, researchers can now access technology that automates this.



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the images in the paper to detect any that should be amended before publication. This technology can check an entire paper in as little as 1 to 2 minutes.

With data issues and duplication being some of the main reasons for retraction, integrating image proofing technology into the process of writing research papers allows researchers to check images as quickly and efficiently as they currently check for grammar and plagiarism before submitting a paper.

About the author:



Dror Kolodkin-Gal is a life science researcher, specializing in new *ex vivo* explant models to help understand disease progression and treatments. During his research, he became familiar with the issues surrounding image errors in scientific publications. Dror is the co-founder of [Proofig](#), an automated software that detects image duplication and manipulation in scientific papers pre-publication. The software checks papers prior to submission and publication, preventing unexpected rejections and helping to improve article quality and credibility.

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