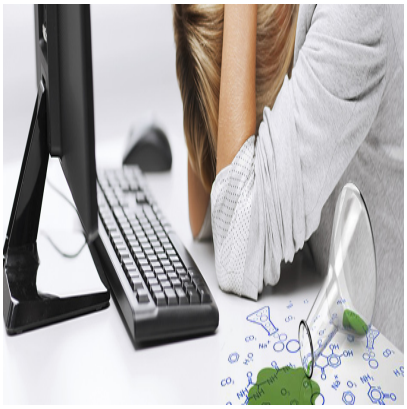


Description

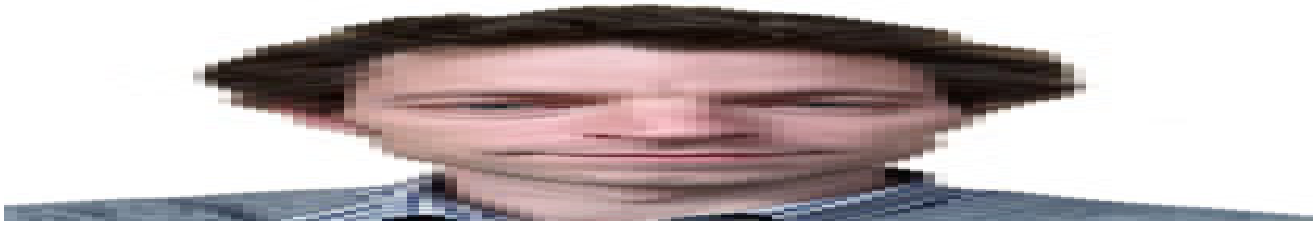
Often, it has been noticed that most of the basic and preclinical research cannot be reproduced. In fact, the studies that cannot be reproduced continue to remain in the literature; thus, other researchers do lose both time and resources in the pursuit of repeating the findings. To stem this unnecessary waste, publication of negative data is important as it can primarily help both science and researchers to pursue better and more novel methodologies. Moreover, to publish such data, publishers would have to develop better publishing models, an example of which is Faculty of 1000 Research (http://f1000research.com/; F1000Research). They focus primarily on preclinical research, particularly from the industry.

Although this model is still new to both publishers and researchers, many researchers have been enthusiastic of this new initiative in principle; nevertheless, the growth of such type of publications is still less and its effects remain to be seen. In response to this new development, the National Institutes of Health and other groups have established guidelines that require more openness as well as more rigorous research methods and data analysis.

With growth in publication of negative data, researchers will be able to publish a lot of unpublished data that has been accumulated while attempting to replicate academic findings. Importantly, industry scientists do not generally publish in-house data, but publication of negative data will benefit industry scientists by helping correct the literature, saving time that would otherwise be spent in futile experiments, as well as reporting instances in which replication has failed because of incorrect methodologies.

Let us see what the industry experts have to say on this topic.

Experts View



It may be futile to uphold scientific values of repeatability and reporting of negative data in some of the more complicated biological sciences, although a registry of

laboratory notebook entries may be worthwhile.

PhD, Cancer (12+ years of Scientific and Medical Writing experience, AU)

It is very clear that unbiased science requires publication of negative results to prevent wasted efforts and to facilitate production of novel hypotheses. However, this issue goes to the heart of science philosophy, and weighs heavily on concepts of pure sciences that lack the intention of utility.

With the global dominance of utilitarian sciences, negative results are commonly perceived as indicative of bad ideas, and are definitely associated with the loss of putative utility. However, as Einstein had no conception of atomic bombs and physicists of 100 years ago were completely ignorant of their contributions to current information technologies, today's string theorists are unable to predict whether their mathematical models will ever be validated, let alone useful.

Negative data are disappointingly futile, particularly if they are not made available, but generally don't warrant the effort of validation, let alone publication. Nonetheless, clinical trials are often performed according to their prospective plans regardless of outcomes, whereas their basic research counterparts are rapidly aborted in the face of negative data. However, basic biological sciences are fraught with anfractuous networks of molecular associations, and the work of systems biologists increasingly shows incomprehensible integration of all molecular pathways. Thus, in the face of uncontrollable biological complexity, unrepeatable associations between molecules may be interpreted as possible rather than probable. Accordingly, it may be futile to uphold scientific values of repeatability and reporting of negative data in some of the more complicated biological sciences, although a registry of laboratory notebook entries may be worthwhile.

The Michelson–Morley experiment is the classic example of a negative result that had significant scientific ramifications.

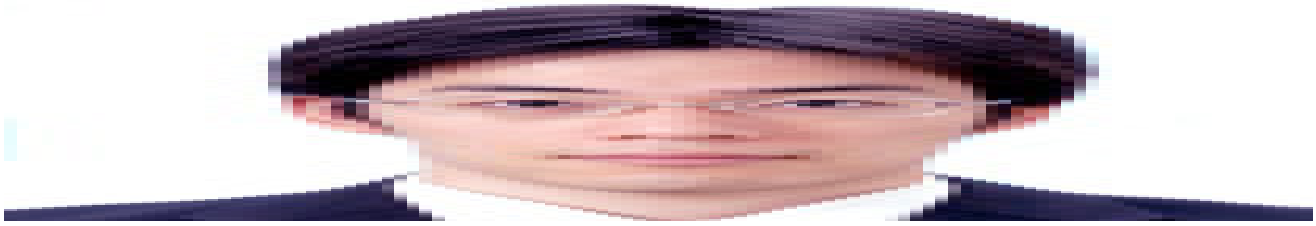
PhD, Organic Chemistry (14+ years of Scientific and Medical Writing experience, US)

When testing any hypothesis by an experiment if it shows a result that supports such a hypothesis, the result is considered to be worthy of publication. However, the unexpected results, which indicate that the hypothesis was incorrect, are never published and most journals will not accept such results for publication. Historically, there have been multiple example where avoiding the publication of negative results has significantly impacted science.

The Michelson–Morley experiment is the classic example of a negative result that had significant scientific ramifications. The experimenters measured the speed of light in different inertial frames—in the direction of the Earth's orbit and against it—expecting to find faster and slower speeds, respectively, as predicted by the prevailing theory of light propagation. However, they found that the speed of light was the same in every direction. This negative result caused consternation in the physics community and eventually led to the special theory of relativity. This "negative result" did as much to advance science as any "positive result." In today's world, another significant impact of this experiment has been the identification of gravitational waves, which were detected by the LIGO detector. This detector identified the way light beams "interfere" with each other and reveal any comparative changes

in arm length during the passage of the light, which is the basis of the famous Michelson–Morley experiment of 1887.

Thus, the publishing community is now beginning to be more receptive to publishing such results. The open access journal f1000Research publishes positive and negative results in the life sciences, whereas some journals, such as Journal of Negative Results in Biomedicine, publish only negative results. This is a trend we should welcome. In my opinion, all scientific data should be published, positive and negative, so long as it advances the state of knowledge.



Publishing negative data can lead to greater information sharing and greater results achieved by the scientific community. Often, people learn more from making a mistake rather than achieving success and the same can be said for the scientific community as well.

MS, Information Technology (11+ years of English-Japanese Translation experience, Japan)

It is not only necessary to publish positive research results but negative ones as well. Only publishing positive results tend to only give a limited and skewed view of research. In the normal outline of scientific experiments, a hypothesis is made and experiments are performed. If results are positive, then your thesis or paper is submitted; however, if results come back negative, then they are usually ignored and not published.

A better, more neutral approach is that all results should be published as long as they are carried out by experiments based on sound hypotheses. Two main reasons for this are that by not publishing negative results scientific literature is skewed by only publishing chosen pieces of information, and this can lead to a waste of resources and time because other scientists considering the same questions may try and perform the same failed experiments.

Publishing negative data can lead to greater information sharing and greater results achieved by the science community. Often, people learn more from making a mistake rather than achieving success and the same can be said for the scientific community as well.

Category

1. Publishing Research
2. Understanding Ethics

Date Created
2016/01/25
Author
admin