Assessing the Negativity Around Negative Results

Stephan C. Jahn, Ph.D.
Department of Medicinal Chemistry and UF Health Cancer Center, University of Florida, Gainesville, FL 32610, USA
Email: scjahn@ufl.edu

Abstract
This opinion piece looks at why negative results are viewed differently from other "positive" results, even though both are equally valid. It argues that the practice of excluding negative data is outdated and is seen as odd and wasteful to those that are not a part of the academic culture.

A couple of years ago I was giving a talk about cancer biology and therapeutics to a lay audience and received a question regarding what they felt was pharmaceutical companies hiding experimental results that reflected on their drug candidates poorly. I had no direct experience with pharmaceutical companies, and still don't, so I was not able to directly answer their question. I did, however, relate to them that in academia "negative results" generally are not published. I think this happens for a mix of reasons that I'll come back to below, but the reasons may contain a dash of pride and self-preservation. We all know that a good proportion of our experiments don't work as intended, but in this hyper-competitive funding environment, admitting that publicly could be seen as a weakness. However, I think it's primarily for the simple reason that in our minds, that's just not how "the system" works.

To me, the most interesting outcome of this exchange was that most of the audience members were dumbfounded, some of them perhaps even angry, that we as scientists don't tell each other when something doesn't work. Of course, this potentially leads to time and money being used by a second lab, and possibly a third or fourth, to do essentially the same experiment. They felt that if the research was sponsored by the NIH, then it was more or less "their" money as taxpayers that was being spent in ways that they felt were inefficient.

This reaction is in stark contrast to the reaction most scientists have to the idea of negative results. I approached a number of my postdoc colleagues and asked them for their opinions on journals publishing negative results in special editions. In many cases, their first reaction was a slight chuckle. I don't think the laugh was toward the special issue, but rather towards negative results in general; but why would negative results be funny? I see them as being somewhat taboo. We all know that there is nothing inherently condemning about negative results; in fact most scientists probably see their usefulness. However, we also know that we "aren't supposed to talk about it" and this perceived conflict comes across as silly and laughable when we think about it.

With that in mind, why DON'T we publish negative results? There's certainly a component of pride, as discussed earlier, but I believe it also has to do with the history of scientific journals. While it is still largely true to this day, nearly the only way to allow others access to your results was to publish in a journal. Prior to the recent move to electronic journals, every article had to be printed on paper, limiting the amount of data that could be published, and studies had to be interesting, otherwise no one would read the article and see the results. Negative results are generally not "interesting" in the traditional sense, so they were not published.

Today, most scientific papers are found through online search engines such as PubMed and ScienceDirect. Researchers find relevant papers through keyword searches, regardless of what journal it was published in or how "interesting"

the results are. We are no longer limited by the maximum practical size of paper journals, allowing us to publish much more information. Journals are increasingly becoming portals to enter information into the database that is the internet. While we do not currently have a system for entering results of individual experiments into this "database," the current system functions quite well in disseminating and making information available in chunks. The roadblocks that prevented the publishing of negative results in the past are no longer as relevant.

As postdocs, we will soon be the PIs that control the flow of data, and the editors that control what is accepted for publication. Let's make full use of the resources at our disposal and think about negative results as a lay person does, not as the current culture of science would tell us to.