Social influence and peer review — impact factor and citation

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Comment on: **D Fisher & N Parisis**
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I read with interest Daniel Fisher and Nikolaos Parisis' [1] analysis of the peer-review process and how it influences the career of scientists, and I agree with many points raised by authors. I would like to add another point to their arguments, namely how impact factor and number of citations can fail to reflect the originality of work and thus might influence the career of scientists, particularly junior researchers.

By way of example, a PubMed search for "HIV, HCV, and Mimivirus" in January 2016 returned 295,809 hits for the first keyword, 44,796 for the second, and 250 hits for the third. In 2015, 15,965 items were indexed for HIV, 3,513 items for HCV, while 28 items were indexed for Mimivirus. From these data, one can conclude that studies on Mimivirus have very little chances of being cited—less than 28 per year—compared to articles on HIV or HCV. Mimiviruses are fascinating beasts: together with Pandoravirus and Megavirus, they are the largest known viruses with a genome of more than 1 million base pairs—bigger than various cellular clades. These giant viruses also have gene homologies with all three domains of life—archaea, prokarya, and eukarya—which

may give tantalizing insight into the early evolution of life.

However, from these data, one can determine that the probability that an article on HCV or HIV is whether 50–100 times higher than an article on Mimivirus in spite of the biological importance of giant viruses—which of course influences impact factors. The number and impact factors of journals covering these three topics are also significantly different. A study on human pathogens can be published in journals that cover topics such as microbiology, cell biology, immunology, infectious diseases, and/or medical microbiology. This does not apply for fundamental/basic research on environmental or evolutionary studies. As a consequence, the resources for some research topics might be scarce or even not available. This makes it much harder to collect data, design further experiments, buy suitable reagents, or validate the results.

The scientific community should discuss how impact factor and citation rates influence research and funding and whether it would be prudent to normalize impact factors in order to compensate for differences between research topics.

Impact factors and citations have become important criteria to evaluate candidates for

all kinds of positions in research. Hiring and funding committee panel should be aware of these variations and should consider other factors such as detailed author contributions, methods implemented in the study, and the significance of the study to the field.

In my personal experience, the current situation is discouraging for many young researchers. They enjoy science and research as an intellectual challenge to understand nature, but a large proportion of qualified young scientists eventually give up research and find jobs outside science or academia. The scientific community, including senior colleagues, editors, reviewers, and committee members should encourage young scientists, and judge them based on their ability to generate and interpret data, solve problems, propose new ideas, and learn new methods—no matter where they publish. We all need to guarantee scientific liberty, fidelity, and equality.

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Reference

1. Fisher D, Parisis N (2015) *EMBO Rep* 16: 1588–1591