

To publish research in life sciences – the changing contours*

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Value judgement on research publications has changed over the decades. Impact factor of a journal can be only one of the criteria to decide the quality of the research done. Often, it is misused for making appointments and assessments. Well-established print journals are losing out to open access journals. India needs to be recognized as a global leader in at least a few areas of research. All other global parameters of excellence would automatically follow.

This write-up is inspired by the recent editorial of Bruce Alberts in *Science*¹ on 'Impact factor distortions', supporting the 'San Francisco Declaration on Research Assessment' (DORA). The Declaration is the outcome of a meeting at the American Society of Cell Biology, held on 12 December 2012. It states that the impact factor (IF) must not be used as 'a surrogate measure of the quality of individual research articles, to assess an individual scientist's contributions, or in hiring, promotion or funding decisions'. This made me to ruminate beyond the IF issue to publication strategies in international scientific journals, review process and evaluation of publications for recruitment and career assessment, and how they have all changed for life scientists in India over the decades. I have published over 150 papers in 50 years. It is not great, but I guess, adequate to share the experience.

When I started research in 1961 as a student, there was no concept of IF. The gold standard in the broad area of biochemical and biophysical sciences was to publish in the *Biochemical Journal (UK)*. The next preferences were *Biochimica Biophysica Acta* and *Archives of Biochemistry and Biophysics*. The *Journal of Biological Chemistry* was slowly acquiring more prominence. A little later the *Journal of Molecular Biology* became prestigious. To publish in *Nature* was not a big deal. Many of the reviewers would correct the English and list typographical errors. When the paper was accepted, it would go through a phenomenal level of editing. I used to marvel at how the editor of the *Biochemical Journal* could cut down a paragraph to half, retaining every bit of information that needed to be conveyed. Despite being strict, most editors

would bend backwards to help publish a good paper from a developing country like India. Over the years, I could write reasonably good manuscripts. The reviewer would often comment that 'the manuscript is written well and the discussion pertinent and relevant'. This has even happened in a few cases, where the paper did not get through! But, I must share a recent experience. We had sent a paper to a journal with an IF close to 10! All the four reviewers were positive, but raised questions seeking explanations, etc. When we sent the revised manuscript, all the reviewers except one stated that they were satisfied. But, the one reviewer stated, 'The authors present a revised version of the manuscript. Most of the scientific and experimental concerns have been addressed to the full satisfaction of this reviewer. It is now an excellent piece of scientific work. Unfortunately, the writing style has not improved. Reading the text gives one a headache. The text is verbose and nominalized. The punctuation is unorthodox to say the least. Numerous sentences make no sense what so ever. Recommendation: The text requires extensive editing and re-writing'. The editor gave a website which listed companies that would offer professional services to edit the manuscript. I was a bit shaken. I have written 150+ papers and perhaps reviewed a greater number for international journals! I have even made editorial corrections! But, I swallowed my pride. The study was important and almost got accepted for publication. The careers of youngsters who put their heart and soul into the study were involved. We took the help of a professional service. This editor commented, 'The experiments and results of the paper are clear. The introduction and discussion flow well with the results. There is some presentation of methods details in the results section that could be moved to Materials and methods. Like-

wise, there is some repetition of results in the discussion section. Because the paper is generally well constructed and flows well, however, it may be/is likely acceptable in its current form'. But, with his help the manuscript had to be rewritten. Sentences were split. Logic for doing an experiment was omitted, so that the experiment itself would reveal the logic! At the end of it all, the manuscript looked like a wingless chicken dressed up for the kitchen! The paper was accepted for publication. But, I did not see my personality in the manuscript, although the original manuscript could have required some editing. I believe editors have no time to edit. It has become standard for all journals to state 'investigators from countries where English is not the mother tongue are advised to take professional help'. No wonder the website has at least two dozen companies offering professional help for editing for a fee, with additional charges for laboratories from Japan! It is important for youngsters in the country not only to have a sound grasp of English, but also develop expertise to write good manuscripts, acceptable to international journals. I do find that many research students have no clue when it comes to writing a research paper for publication in a good journal. Even then, one may have to face a reviewer, who does not like your style of writing. I have the excuse of ageing!

With the advent of IF, the whole scenario has changed. *Nature*, *Science*, *CELL*, etc. have all become the dream of every youngster. I have often heard youngsters telling me that they are trying desperately to move from single digit to double digit IF journals! The oldies might have given up! The open access journals tend to have higher IF than standard, well-established print journals. The IF of the latter is steadily going down. People are queuing up to publish in one such open

*I wrote this piece before I read the editorial by Balaram².

access journal, where almost anyone can become an editor/reviewer. The result is that the papers are of uneven quality. In the higher IF journals, the first major victory is when a paper gets accepted for review! This has permeated to almost all the journals of some standing. Within a few days of submission, one is ready to receive an e-mail, the general refrain being, 'this journal receives lot more good papers than it can publish. The rejection rate is very high. We perceive that your paper would not be of interest to the target audience of this journal. We suggest that you send the paper to a specialist journal in your field'. As a consolation, it would also state 'our decision does not reflect on the quality of the study, but would help you to save time since it is unlikely that it would get through with our reviewers'. One can accept this decision by 'professionals' as an act of wisdom, except when you see a similar paper appearing in the same journal! Contacts are terribly important. It helps if people know your face, having met you in some conference, etc. especially if you are from a developing country like India! I have paid a price (no regrets) for not cultivating powerful international groups. Youngsters must attend international meetings, present their work and maintain old contacts and develop newer ones. It is not enough to do good science, but you should also know how to sell it.

As pointed out by DORA and Bruce Alberts, the IF concept has caused havoc all over the globe, more so in India. Faculty/scientist appointments are definitely made based on the IF of journals in which the candidate has published. It is one thing if a candidate has successively published papers in high IF journals, since it can reflect a level of consistency. It is acceptable, if IF is used as one of the factors in assessment. But, it is taken to ridiculous levels of equating one paper in say, *CELL* to half-a-dozen good papers in specialist journals in different areas, be it *Biochemistry*, *Parasitology* or *Endocrinology*. This means people have no time to read the papers and make an assessment of the scientific contributions made. I guess this happens in the selec-

tion of candidates for awards or election to the fellowship of science academies. I have noticed that applicants have to provide information on the IF of journals, citation index, *h*-index and other indices with which I am not familiar. This leads to the problem of self-citation to boost citation index. A software has to eliminate all self-citations. Another software has to be applied to detect plagiarism. This software would detect all the sentences describing the standard experimental protocols routinely followed in a laboratory and described as such in the papers written as not original! The sentences have to be artificially reconstructed to avoid the tag of plagiarism! Who knows? The editor may be using the same software!

Back to history! In those days, it was a luxury to send the manuscripts by airmail. I used to spend time as a visiting scientist at the University of Chicago and the boss would pass on some of the papers received by him for reviewing. One can immediately make out the papers from India. First of all, the manuscript would be hanging out of the brown cover. It was a big step to jump from thin brown covers to cloth covers! The typesetting and the quality of figures would be poor. I remember students running to 'specialists' to take gel photographs, be it Delhi or Bangalore. He has to make the almost invisible band visible! In spite of that, there were not many cases of cheating or forgery and the results presented in papers from India have stood the test of time. With the advent of photoshop, I believe, manipulations have become rampant all over the world. Even mediocre data are made to look impressive with all the colour combinations and animations at hand! Even so, leading journals do not find imaging data generated in many Indian laboratories satisfactory.

Many of us do the strategic mistake of not writing reviews based on our contributions. Someone else writes the review and we are happy that our papers are quoted! But, when others follow your work, they would most often quote the review and not the original contribution!

Of course, reviews are supposed to be solicited and by invitation. But, you can gatecrash, trying to impress the editor with an abridged version. This is where contacts, pedigree, etc. would help, apart from actual research contributions. To make a mark working in India is not easy. We can go back to the often and on discussed theme of having our own journals. We do have a large number in the country, where one can publish the three papers for a fee, required according to UGC norms for promotion. We are still at the stage of classifying our journals as indexed and not indexed. I do not see a mechanism to build a journal of true international standing. I believe this can happen only when a substantial number of scientists in India are able to generate work that can receive international attention, even if the subject matter is locally relevant. From all the available information on international rankings of our research institutions, etc. we are lagging behind. The reasons are many. I am not sure we should worry too much about these rankings. Intrinsically our scientists are as good as anyone else in the globe. But, goals must be clear. Let me give one example. Can we develop a tuberculosis (TB) diagnostic that is accepted internationally? Can we do research to dramatically shorten the 6-month TB therapy? Can we develop a new drug molecule to treat latent TB? In short, can we be global leaders in TB research? There will be hundred other examples, crying for a commitment from scientists in India. We need to be recognized as global leaders at least in a few areas of research. This would call for an all-out effort, in spite of all the odds against us. In my opinion, other things will automatically follow. We need to be trendsetters and not just camp followers.

1. Alberts, B., *Science*, 2013, **340**, 787.
2. Balaram, P., *Curr. Sci.*, 2013, **104**, 1267–1268.

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