



# Evaluating biomedical journals: from the author's and the reviewer's perspective

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The 20th century is characterized by the enormous and unprecedented explosion of the scientific research. The influence of this research outbreak is such that in the new millennium science started already to play a critical role in determining the new working conditions for the whole world. As a result, scientific research will have to reconsider itself in at least socioeconomic terms and consequently the quality of the scientific research will have to be objectively evaluated. The assessment of macroeconomic impact and demands of this research is not possible at this point.

The microeconomic needs and the investment units in this world-market are directly related to the evaluation of the researchers and the research centers. Everyday the stocks of the basic media of the scientific production - which are the scientific journals - are being invested in the stock exchange of research values. It is a bit strange to talk with market terms and refer to the scientific press. But it is as if we were hiding behind our finger to overlook the fact that the terms for the distribution of the scientific information are similar with that of the other consumer products. Too many scientific journals, a concomitant inflation in scientific press, double publications, and subjective reviews are facts today, not to mention the scientific fraud.

The question that rises is whether the scientific community has the tools to protect the scientific product and producers. In this control system more parameters should be involved such as the central government, the publishing industry, the editors, etc. From the multiparametric nature of the problem it is rather obvious that the answer to the previous question is very difficult.

With this respect, the citation analysis may still remain the only way to come closer to the problem: from the complete analysis and evaluation of the reference/citation data, various criteria can be formulated for the scientific value of the researchers and their work. How feasible is such a goal and how

objective the judgments can be? The reference and citation of other researchers' results have been recognized as the criterion for research quality. The number of citations of the scientific articles was used for the first time in 1927 by Gross and Gross for Chemistry Journals, but in the biomedical sciences the first attempt was made in 1944 for Journals of Physiology. At that time, Physiology was the frontier in medical research. The systematic evaluation of the biomedical journal by the study of the citations started with the introduction of the impact factor at the beginning of the sixties.

The impact factor is calculated by the Institute for Scientific Information, and is published at the Science Citation Index since 1972. The impact factor is also a reliable mean for the comparison of competitive journals, and is useful for the editors, advertising companies, and all those who are involved in the production and distribution of scientific journals. No doubt, it represents a strong evidence for the general role of the particular journal in the scientific field. The impact factor changes almost everyday: back in the late seventies - early eighties it was easier to publish in the journals *Nature* or *Science* characterized even at that time by high impact factors. Today publishing in these periodicals is extreme difficult.

The current accumulation of scientific knowledge is such so that publishing something extremely new is rare. The impact factor also changes according to "what is in" in science. A current example as it appeared on the Science Citation Index on the fluctuation of the impact factor may be useful: seven to eight years ago *Genetics* was leading the way in biomedical research. The journal *Nature Genetics* within two years of its publication reached a high number of impact factor 40.000 when the highest impact factor for orthodontic journals reaches only 0.600. For some time the journal *Nature Genetics* even scored more than the journal *Cell*, which represents the leading journal in biomedical research. In the year 2000 the impact factor for *Nature*



*Genetics* fell more than 10 points to 30.910 and today the impact factor is 29.600 (Citation Index 2001), showing a decreasing trend. It will probably stabilize as genetics research reaches a balance. It seems that the impact factor follows the pendulum that swings in science: the last decade identifying a gene responsible for a disease was very important. Today things have changed dramatically: the fact that in many cases and for the same exactly condition more than one genes are responsible, have switched the attention to functional genomics. In other words, the mode of action of a gene, its regulation and the interplay among various gene products is important. *Cell* still remained the journal with the highest impact factor, because it always publishes studies that refer to molecular mechanisms and opens new scientific horizons.

It is natural that all authors have always tried to publish to the highest impact factor journals, so that their work will be referred in the future. This is rather legitimate. The problem arises from the intriguing referring process. It should be taken into account that the referees are also scientists and some times is so that they may work on similar projects, a fact which

represents a moral problem. Some journals have tried to bypass this problem by providing both names of author and reviewer. Another problem is the trend of some authors not to cite results from competing colleagues, so that the work of their antagonists will not be cited. Here the role of the editor is very decisive. This is the reason that editors should thoroughly know and overview the wide scientific spectrum of the journal. In case of a journal covering a widespread scientific area, (i.e. orthodontic and craniofacial journals), section editors may be absolutely necessary.

The problems encountered in evaluating biomedical journals are many and difficult to be solved at once. To this end the editor and the editorial board seem to play a very important role for the well-being of the journal as well as of the integrity of the science. Both represent the journal in the scientific community and should be (or were in the past) heavily involved in areas related to the journals' research fields. By avoiding the formation of influential side groups within the scientific journals and the scientific community, biomedical journals will stand only on scientific merit and will contribute a lot to the scientific knowledge.