

Highly Cited Paper of IJBB: A Report

Indian Journal of Biochemistry and Biophysics (IJBB) has entered into its fiftieth year of publication in the year 2013. The journal began to be indexed in Science Citation Index since it came into being in 1964 as the *Indian Journal of Biochemistry* (renamed as *Indian Journal of Biochemistry and Biophysics* in 1971) and has indexed 6646 papers from the journal since. In 2012, the journal for the first time crossed the Impact Factor (IF) 1.000. As per the ISI Web of Knowledge's Journal Citation Reports 2011, *Indian Journal of Biochemistry and Biophysics* ranks 11th among the 100 Indian journals indexed in JCR and has an IF value 1.142.

It is well-known that the impact factor of a journal is primarily based on the number of citations received by the articles published in the journal and as such the quality of a journal depends on the quality of articles published in a journal. Generally, articles that receive 100 or more citations have been referred to as highly cited articles^{1,2}. There are several factors that make an article highly cited and it varies from discipline to discipline. A recent work looked at articles that receive huge citations (in the order of 1000+ citations) and such hugely cited papers have been referred to as champion works³. Highly cited papers, i.e. papers that have received 100 or more citations have been studied by various authors⁴⁻⁹. However, hugely cited papers or the champion works that are an indicator for identifying milestone works have not been widely studied.

It was revealed that there are 38 papers with at least one author from India that have received 1000 or more citations³. Interestingly, out of these 38 papers, only paper is from an Indian journal while all the other papers that have received 1000+ citations have been published in foreign journals. The lone Indian paper is: Kakkar P, Das B and Viswanathan P N (1984) A modified spectrophotometric assay of superoxide-dismutase. *Indian Journal of Biochemistry and Biophysics* 21 (2), 130-132.

The paper describes a simple and rapid method for the assay of superoxide dismutase in biological samples. The method takes advantage of the inhibition of NADS-dependent-nitroblue tetrazolium reduction by the dismutase. The study found that

inhibition of the chromogen formaton by superoxide dismutase was linear with increase in enzyme concentrations and the chromogen extract in butanol was stable even up to 48 h¹⁰.

As per the Science Citation Index-Expanded database of the Web of Science, the paper has received 1070 citations as on 04 April 2013. The citation count is higher in Google Scholar and Scopus owing to the wide coverage of these two sources. However, here we look at the citations as available in the Science Citation Index-Expanded.

It can be seen from Fig. 1 that the 1984 paper received its first two citations in 1989, nearly 5 years after the publication of the paper. In the first decade of the paper's publication, it received less than 10 citations per year and about 50% or the citations were received in the first 24 years. From 2009, the number of citations has surged with the paper receiving more than 100 citations every year since. The paper has been cited from 39 countries, but more than 90% of the citations (909 citations) are from India, followed by USA (40), China (35), Iran (32) and so on.

Table 1 gives the top 10 countries from where the article has been most cited. We also looked at the institutions that have cited the paper and it is seen that researchers from Annamalai University have cited the paper 303 times followed by University of Kerala (79 papers). The Indian Institute of Toxicology Research (56 times), the institute that published the hugely cited paper is the third in the list of institutions that have cited the paper the most (Table 2).

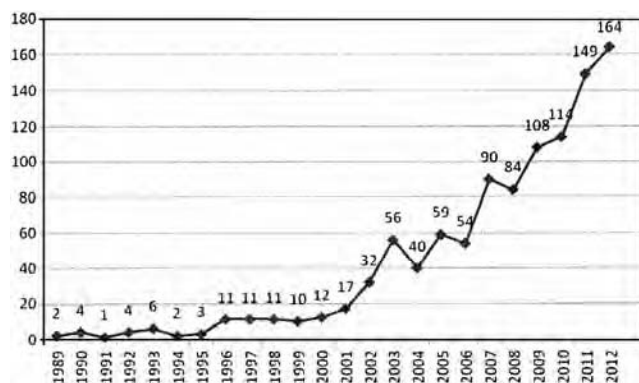


Fig. 1—Growth of citations

Table 1—Citations from top 10 countries

Sl. No.	Countries/Territories	Citations
1.	India	909
2.	USA	40
3.	Peoples R China	35
4.	Iran	32
5.	Pakistan	26
6.	Saudi Arabia	26
7.	South Korea	20
8.	Egypt	15
9.	France	9
10.	Japan	6

Table 2—Citations from top 10 Indian organizations

Sl. No.	Organizations	Citations
1	Annamalai University, Tamil Nadu	303
2	University of Kerala, Kerala	79
3	Indian Institute of Toxicology Research, Lucknow	56
4	Bose Institute, Kolkata	39
5	Central Drug Research Institute, Lucknow	34
6	Jadavpur University, Kolkata	34
7	Metabolic Disorders Research Centre, Trivandrum	32
8	All India Institute of Medical Sciences, New Delhi	30
9	Defence Research Development Establishment, Gwalior	30
10	Gujarat University, Gujarat	26
11	Medical College Hospital, Trivandrum	26

The 1070 citations are of papers that have been published in 315 journals with *Journal of Ethnopharmacology* citing the *IJBB* paper 41 times, followed by *Food and Chemical Toxicology* (33) and another CSIR-NICAIIR journal, *Indian Journal of Experimental Biology* citing the paper 26 times. Incidentally, the source journal *Indian Journal of Biochemistry and Biophysics* has self-cited the paper only 11 times. The average IF of all the citing journals is 2.148 and the journal with the highest IF that has cited the article is *Biomaterials* (2 citations, IF 7.404), followed by *International Journal of Cardiology* (3 citations, IF 7.078) (Table 3).

Indian Journal of Biochemistry and Biophysics, now in its 50th year has established itself as a leading

Table 3—Citations from top 10 journals

Sl. no.	Journals	Papers	JIF
1	<i>Journal of Ethnopharmacology</i>	41	3.014
2	<i>Food and Chemical Toxicology</i>	33	2.999
3	<i>Indian Journal of Experimental Biology</i>	26	1.295
4	<i>Molecular and Cellular Biochemistry</i>	25	2.057
5	<i>European Journal of Pharmacology</i>	22	2.516
6	<i>Chemico Biological Interactions</i>	21	2.865
7	<i>International Journal of Neuroscience</i>	21	0.967
8	<i>Journal of Pharmacy and Pharmacology</i>	20	2.175
9	<i>Toxicology</i>	19	3.681
10	<i>Clinica Chimica Acta</i>	16	2.535

journal. With an IF of 1.142 in 2011, it is India's 11th top journal and now holds the credit of being the first and only Indian journal to have published one of India's hugely cited work.

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