"Current Comments"

Journal Citation Studies. III. *Journal of Experimental Medicine* Compared with *Journal of Immunology*; or, How Much of a Clinician is the Immunologist?

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There are at least two important motivations for the short articles I have been publishing in *Current Contents* ® for the past several years. First, I feel a sense of urgency about communicating the information that is uniquely available from ISI®'s data banks and experience. Because of the extent and character of its readership, *Current Contents* is in a position to influence the future course of scientific communication. We have an obligation to take advantage of our focal role in that process. On the one hand, I don't wish to be some lesser Mendel, so far ahead of his time that a significant contribution is ignored for decades. On the other hand, I wish even less to rediscover the wheel, long after others have enjoyed the thrill of its first discovery. Surely such feelings must be shared by the majority of scientists. One wishes to make a contribution to one's society, however small, and to make it at a time and place and in a manner that will maximize its impact.

Second, I simply enjoy writing and having the opportunity to share my views with a large audience. While the avenue of publication in regular "primary" scientific journals is open to me, I feel a great sense of frustration with them. This feeling is shared by many of my colleagues. The existing scientific communication process is painfully slow on most occasions. Most of my articles in learned journals were delayed at least a year. During this time, one suffers unnecessary anxiety, not so much from fear that one may be scooped, but that the message, when eventually made public, will no longer be consonant with the times. One year in this fast-changing world *is* quite a long time. Two years can be almost unbearable. While waiting for the "normal" publication and refereeing process to grind on to eventual fulfillment, one in my position finds himself becoming a huge minipublisher. It is, therefore, far more economic for me to express myself directly in these pages. While the "prestige" of publishing in *Current Contents* may not be equivalent to that of learned primary journals, *CC*®*'s* circulation and readership is certainly equivalent to that of *Nature, Science,* and a number of other journals I could mention.

What is all this leading up to? At one time, adhering to a weekly editorial schedule seemed a burden. Now I find that the amount of editorial material I have available for publication is so backlogged that I simply can't delay inclusion of more material without inflicting on myself the same treatment I would receive at the hands of other publications. For the next several months, I shall reduce this backlog by including discussion of two or more topics in a single issue. Lest anyone think that I do all of this single-handed, they are mistaken. Everything I write, or have ever written, is subjected to editorial review by colleagues both in and outside of ISI. There is a calculated risk in this. I think the refereeing system is very important to the health of science, but not if it delays publication for more than a month or so. On occasions I have made errors that might have been prevented had I been forced to submit all my work to outside and perhaps even "hostile" referees. But overall I feel well-satisfied that reasonableness has prevailed.

In forthcoming issues of *Current Contents* I intend to publish numerous "Journal Citation Studies". These will be consecutively numbered and eventually cumulated as a collection for distribution to librarians and others. Previously I have published such studies for biochemistry[1] and chemical physics.[2] And the next in this series is this "Journal Citation Studies. III. *Journal of Experimental Medicine* compared with *Journal of Immunology*."

By analyzing the citations in ISI's data bank for the *J Exp Med* and *J Immunol* I believe we have established an important basis for better understanding how journal citation analysis can reveal terminological as well as other changes in the character and history of individual journals and fields.

Originally we chose *J Exp Med* because it ranks as one of the most cited journals in the world, and one that ranks highest in terms of its "impact", that is, the average number of times each of its articles is cited. We subsequently determined the exact number of times a sample of the 313 articles published in *J Exp Med* in 1967 and 1968 were cited in 1969, in order to establish whether a small group of articles boosted the average or whether, in fact, the articles in it are consistently cited more frequently than articles in other journals.

Apart from the confirmation of impact, the analyses reveal an important point about this journal. It is probably badly named. No other journal seems to play as important a role today in the transfer of information on immunology. This is observed by comparing its citation pattern with that of the *J Immunol.* Just as we once posed the questions "how much of a chemist is a biochemist?" and "how much of a chemist is a chemical physicist?", we now ask "how much of a clinician is the average immunologist?"

Among other interesting observations about *J Exp Med* & *J Immunol* is the paucity of their reference to clinical journals. *Lancet* is heavily cited, but that is not uncommon for experimental journals, as we found in our study of genetics.[3] There is a substantial amount of citation of *J Exp Med by* clinical journals. This illustrates its role and impact in the flow of basic research to clinical application, which ought to be kept in mind by science policy planners who have any doubts about the role of basic research in stimulating clinical advances and applications.

As in other fields, those who are intimately familiar with the *J Exp Med* may say that we are stating the obvious. I would remind them that one needs to state the obvious from time to time. For many, this information is not obvious. Any library which is acquiring such a journal should be aware that it is in fact acquiring a journal of immunology rather than "medicine". On the other hand, the close and heavy dependence of this journal on the biochemical and immunology literature should indicate the obvious importance it has in departmental libraries of biochemistry and immunology. Clinical libraries in small hospitals and elsewhere may wish to reconsider whether this is the "medical" journal they thought its title implied it to be. As I've said before, citation data may raise more questions than we are used to answering. Being selective about journals and scientific information is never an easy process. It is, however, vastly more enjoyable and efficient to have information available for a decision-making process than it is to work completely by intuition.

Certainly the Rockefeller University Press, which publishes *J Exp Med,* can take great pride in the enormous role and impact this journal enjoys. Other journals might do well to study all the factors contributing to its success.

On the following pages will be found a comparison of the citation patterns of *J Exp Med* and *J Immunol.* In each case, the listings show how frequently the journal has cited other journals, and how frequently other journals have cited it. The lists show only the top 40 journals involved in each case. Overall, *J Exp Med* was cited 15,536 times during 1969; *J Immunol* was cited 10,492 times during the same year. The data shown are an extrapolation for the entire year. In frequency of citation, *J Exp Med* stands 36th among most cited journals, but 13th in impact factor, with a score of 8.3. *J Immunol* ranks 49th in terms of total citations, and 40th in impact with a score of 4.1.[4,5] The coupling profiles for these two journals, in terms of citing and cited journals, are *incredible* to say the least.

1. Garfield, E. What is the "core" literature of biochemistry as compared to the "core" of chemistry. *Current Contents* No. 5, p. 6-9, February 2, 1972.
2. ·····. What is the "core" literature of chemical physics? *Current Contents* No. 9, p. 5-8, March 1, 1972.
3. ····· & Sher, I.H. *Genetics Citation Index; Experimental Citation Indexes to Genetics with Special Emphasis on Human Genetics.* (Philadelphia: Institute for Scientific Information, 1963), 854 pp., cf. introductory material, pp. i-xviii.
4. ·····. Citations-to divided by items-published gives journal impact factor; ISI lists the top fifty high-impact journals of science. *Current Contents* No. 8, p. 6-9, February 23, 1972.
5. ·····. Citation analysis as a sociometric tool for journal evaluation and science policy studies. *Science,* in press.

CITATION PATTERN OF *J EXP MED* AND *J IMMUNOL* AS SOURCE (CITING) JOURNALS.

List I

Rank	Times Cited	Journal Title Abbreviation
1.	1084	J Exp Med
2.	572	J Immunol
3.	236	*Nature*
4.	168	Immunology
5.	164	Science
6.	156	Proc Soc Exp Biol Med
7.	128	Internat Arch Allergy Appl Immunol
8.	104	Fed Proc
9.	100	J Biol Chem
10.	92	Biochem J
11.	76	Proc Nat Acad Sci USA
12.	76	Transplantation
13.	72	Ann NY Acad Sci
14.	68	Immunochemistry
15.	64	Cold Spr Harb Symp Quant Biol
16.	60	Biochemistry
17.	56	Biochim Biophys Acta
18.	52	J Clin Invest
19.	44	J Cell Biol
20.	40	Progr Allergy
21.	36	Clin Exp Immunol
22.	32	Adv Immunol
23.	32	Austral J Exp Biol Med
24.	32	J Infect Dis
25.	28	J Allergy
26.	28	Lancet
27.	28	Proc Royal Soc B Biol Sci
28.	24	Am J Pathol
29.	24	Ann Inst Pasteur (Paris)
30.	24	Biochem Biophys Res Comm
31.	24	J Nat Cancer Inst
32.	24	Methods Med Res
33.	20	Am Rev Resp Dis
34.	20	Bacteriol Rev
35.	20	Clin Sci
36.	20	Exp Cell Res
37.	20	J Bacteriol
38.	20	J Biophys Biochem Cytol
39.	20	J Histochem Cytochem
40.	20	J Pathol Bacteriol
	1388	All others (220 other journals)
	5296	TOTAL

List II

Rank	Times Cited	Journal Title Abbreviation
1.	2176	J Immunol
2.	1404	J Exp Med
3.	588	Proc Soc Exp Biol Med
4.	576	Nature
5.	412	Science
6.	408	Immunology
7.	244	J Biol Chem
8.	240	Fed Proc
9.	196	J Clin Invest
10.	196	Proc Nat Acad Sci USA
11.	188	Internat Arch Allergy Appl Immunol
12.	184	Immunochemistry
13.	168	Biochem J
14.	156	Biochemistry
15.	144	Lancet
16.	140	Ann NY Acad Sci
17.	140	J Infect Dis
18.	120	Biochim Biophys Acta
19.	108	J Bacteriol
20.	100	Adv Immunol
21.	92	Progr Allergy
22.	88	Cancer Res
23.	84	J Nat Cancer Inst
24.	84	Virology
25.	76	J Allergy
26.	68	Acta Pathol Microbiol Scand
27.	68	New Engl J Med
28.	64	J Molec Biol
29.	64	Transplantation
30.	60	Brit J Exp Pathol
31.	60	Cold Spr Harb Symp Quant Biol
32.	56	Clin Exp Immunol
33.	44	Am J Hyg
34.	40	J Lab Clin Med
35.	40	Austral J Exp Biol Med
36.	40	Bacteriol Rev
37.	40	J Amer Chem Soc
38.	40	Lab Invest
39.	36	Ann Inst Pasteur (Paris)
40.	36	Blood
	3112	All others (392 other journals)
	9068	TOTAL

List I shows journals cited by *J Exp Med* during 1969, and the number of times they were cited. **List II** gives the same information for *J Immunol.*

CITATION PATTERN OF *J EXP MED* AND *J IMMUNOL* AS REFERENCE (CITED) JOURNALS.

List I			List II		
Rank	Times Citing	Journal Title Abbreviation	Rank	Times Citing	Journal Title Abbreviation
1.	1408	J Immunol	1.	2176	J Immunol
2.	1084	J Exp Med	2.	572	J Exp Med
3.	512	Proc Soc Exp Biol Med	3.	396	Proc Soc Exp Biol Med
4.	340	Immunology	4.	284	Immunology
5.	288	Transplantation	5.	204	Transplantation
6.	240	J Bacteriol	6.	164	Ann Rev Microbiol
7.	236	Klin Wschr	7.	152	Clin Exp Immunol
8.	224	Proc Nat Acad Sci USA	8.	152	Proc Nat Acad Sci USA
9.	220	Thromb Diath Haem	9.	148	J Bacteriol
10.	196	Ann NY Acad Sci	10.	136	Immunochemistry
11.	196	Science	11.	132	Nature
12.	192	Clin Exp Immunol	12.	132	Science
13.	188	Fed Proc	13.	128	J Pediat
14.	184	Ann Rev Microbiol	14.	120	Prod Probl Pharmaceut
15.	172	J Infect Dis	15.	116	Am J Epidemiol
16.	172	J Nat Cancer Inst	16.	116	Fed Proc
17.	160	Immunochemistry	17.	108	J Nat Cancer Inst
18.	152	Experientia	18.	104	Am J Trop Med
19.	152	J Virology	19.	104	Biochemistry
20.	148	Acta Path Scand	20.	104	J Virology
21.	148	Nature	21.	100	Ann NY Acad Sci
22.	144	Lancet	22.	100	Fol Biol
23.	144	Virology	23.	96	Am J Cardiol
24.	140	New Engl J Med	24.	96	Klin Wschr
25.	128	Am J Med	25.	92	Appl Microbiol
26.	128	Am J Pathol	26.	88	Acta Virol
27.	124	Am J Vet Res	27.	84	Internat Arch Allergy Appl Immunol
28.	124	Military Med	28.	84	J Infect Dis
29.	116	Am J Cardiol	29.	80	Experientia
30.	112	Biochemistry	30.	80	New Engl J Med
31.	108	Biochem Biophys Acta	31.	76	Lancet
32.	104	Ann Inst Pasteur (Paris)	32.	72	Myocpathol Mycol Appl
33.	104	Annu Rev Genetics	33.	68	Biochim Biophys Acta
34.	104	Cancer Research	34.	68	Vox Sanguinis
35.	104	J Gen Virology	35.	64	Arch Gen Virol
36.	100	Lab Invest	36.	64	Military Med
37.	96	J Clin Invest	37.	60	Acta Microbiol Acad Sci Hung
38.	96	Zbl Bakteriol	38.	60	Acta Pathol Scand
39.	92	Brit J Exp Pathol	39.	56	Ann Intern Med
40.	88	J Med Microbiol	40.	56	Exp Parasitol
	6768	All others (368 other journals)		3400	All others (288 other journals)
	15536	TOTAL		10492	TOTAL

List I shows journals that cited *J Exp Med* during 1969, and the number of times they cited it. List II gives the same information for *J Immunol*.