

What is the "Core" Literature of Biochemistry as Compared to the "Core" of Chemistry?

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Is a biochemist less of a "chemist" than a physical or polymer chemist? Recently, we compiled the list of the most frequently cited journals of science.1 This list contains all of the most important journals in biology, chemistry, physics, math, medicine, etc. And in a recent editorial.² I described a game of "musical journal lists" that could be played by librarians-the main point being that the list of 1,000 most cited journals of "science" turns out to be essentially the same list as the 1,000 most cited journals in chemistry, physics, or any other field you wish to name.

Having identified the list that represents 90% or more coverage for any field what can SCI® data now tell us about the small group of journals that constitute the "core" or nuclear zone of a typical Bradford distribution?³ The key to this problem is knowing where to begin. What article, author, organization, or journal most "typifies" a "field"? For example, is the Journal of the American Chemical Society more or less "typical" of "chemistry" than the Journal of the Chemical Society (London) or Chemische Berichte? By extension is Biochemistry, also published by the ACS, more or less typical for that field?

By referring to $ISI^{\textcircled{o}}$'s Journal Citation Index data bank, I determined that the journals listed on page 8 were most frequently cited by the JACS during 1969.⁴ Similarly, the JACS was in turn cited most frequently by those journals marked with asterisk. There is a close but not exact correlation between these two lists. Being a much larger journal, with a long history, the JACS will be cited frequently by other smaller or newer journals that it does not cite too often.

We have a similar problem in any field we wish to choose. The selection of the starting point is critical. However, if one uses a variety of techniques for "clustering" information of this kind, one finds that after several iterations certain "clusters" stand out. One gets a kind of "numerical" classification.⁵ As you can imagine, performing clustering experiments can eat up great quantities of computer time. Identifying "similarities" in this fashion is not difficult, but it is costly because there are so many possible combinations.

As an interesting comparison to the list for JACS we have also included a comparable list for *Biochemistry*; the list shows the journals most frequently cited by *Biochemistry*, and marks with asterisk journals which cite *Biochemistry* most frequently. This journal obviously draws heavily on other biochemical journals in contrast to the *JACS*. The important biomedical journals, already identified in the top 1,000 journals of science, are also heavily drawn upon. Note how little the *JACS* refers to biochemical journals!

Recently we applied a technique of this kind, using our data bank, to obtain an improved list of "categories" for the journals we cover in the Science Citation Index[®] and also for Current Contents[®]. How would you decide which journals are "closer" or more "similar" when confronted with the information that the third most frequently cited journal in Phytopathology is not a botany journal but rather Virology? Similarly, it may be surprising that fully 25% of the citations to Aerospace Medicine occur in the journal Human Factors, which is very rarely cited by Aerospace Medicine. This tells us something about the journal Aerospace Medicine, but perhaps also something about the ergonomic applicability of some of our space research.

Imagine all the permutations and combinations for 2,000 or more journals indexed in the Science Citation Index, no less the thousands of other journals which can be and are cited. ISI would like to make this information available to as many people as can use it. May we hear from you as to how you might use such data and in what form or arrangement you would prefer to see it?

- 1. Garfield, E. A basic journal collection; ISI lists the fifty most-cited scientific and technical journals. *Current Contents* No. 2, p. 3-5, January 12, 1972.
- ----- The mystery of the transposed journal lists; wherein Bradford's Law of Scattering is generalized according to Garfield's Law of Concentration. Current Contents No. 31, p. 5-6, August 4, 1971.
- 3. Bradford, S.C. Documentation. (Washington, D.C., Public Affairs Press, 1950).
- 4. Citation counts were made, and journals ranked, by methods described in Reference 1, above.
- 5. Sokal, R.R. & Sneath P.H.A. Principles of numerical taxonomy, (San Francisco, W.H. Freeman, 1963).

JOURNALS MOST-CITED BY JACS

	Times Cited	Title
1.	14012	*Journal of the American Chemical Society
2.	1920	*Journal of the Chemical Society
3.	1472	*Journal of Organic Chemistry
4.	1376	*Tetrahedron Letters
5.	1036	Chemical Communications
6.	884	*inorganic Chemistry
7.	820	*Journal of Physical Chemistry
8.	708	*Chemische Berichte
9.	620	*Canadian Journal of Chemistry
10.	568	*Angewandte Chemie
11.	500	*Tetrahedron
12.	400	*Transactions of the Faraday Society
13.	302	*Annalen der Chemie
14.	292	*Journal of Biological Chemistry
15.	252	Bulletin of the Chemical Society of Japan
16.	252	*Helvetica Chimica Acta
17.	240	*Analytical Chemistry
18.	236	*Acta Crystallographica
19.	228	*Accounts of Chemical Research
20.	224	*Chemical Reviews
21.	224	*Journal of Organometallic Chemistry
22.	216	* Acta Chemica Scandinavica
23.	208	Nature
24.	204	*Quarterly Reviews
25.	188	Chemistry and Industry
26.	184	Molecular Physics
27.	180	* Recueil des Travaux Chimiques des Pays-Bas
28.	152	*Biochemistry
29.	144	*Proceedings of the National Academy of Sciences of the United States
30.	140	*Journal of Inorganic and Nuclear Chemistry
31.	120	*Bulletin de la Societe Chimique de France
32.	112	Organic Synthesis
33.	112	Proceedings of the Chemical Society
34.	104	Proceedings of the Royal Society
35.	96	*Biochimica Biophysica Acta
36.	88	*Australian Journal of Chemistry
37.	84	*Biochemical Journal
38.	76	*Advances in Chemistry Series
39.	76	Discussions of the Faraday Society
40.	76	Progress in Physical and Organic Chemistry
41.	76	Gazzetta Chimica Italiana
42.	72	Photochemistry and Photobiology
43.	/2	Science Advances in Physical and Organic Chemistry
44.	80	Advances in Physical and Organic Chemistry
45.	60	*Doklady Akademii Nauk SSSP
40.	60	Physical Review
47.	60	Zhurnal Obshchei Khimii
49	56	*Comptes Rendus Hebdomadaires des Seances de l'Academie
		des Sciences

50. 56 Pure and Applied Chemistry

JOURNALS MOST-CITED BY BIOCHEMISTRY

	Times Cited	Title
1.	2836	*Journal of Biological Chemistry
2.	2204	*Blochemistry
3.	1384	*Journal of the American Chemical Society
4.	1260	*Biochimica Biophysica Acta
5.	1044	*Proceedings of the National Academy of Sciences of the United States
6.	724	*Biochemical Journal
7.	632	*Journal of Molecular Biology
8.	612	*Archives of Biochemistry and Biophysics
9.	540	*Biochemical and Biophysical Research Communications
10.	456	*Nature
11.	340	* Federation Proceedings
12.	312	"Science
13.	264	Methods in Enzymology
14.	184	Advances in Protein Chemistry
15.	184	* Analytical Biochemistry
16.	176	Analytical Chemistry
17.	160	*Journal of Chemical Physics
18.	144	*Annais of the New York Academy of Sciences
19.	136	Annual Review of Biochemistry
20.	132	Biochemische Zeitschrift
21.	128	Journal of the Chemical Society
22.	128	*Journal of Physical Chemistry
23.	124	Acta Chemica Scandinavica
24.	112	*Journal of Experimental Medicine
23.	108	Biophysical Journal
20.	104	*Journal of Immunology
27.	96	*Journal of Biochemistry
20.	92	*Hoppe-Seylers Zeitschrift für physiologische Chemie
29.	92	Cold Spring Harbor Symposia on Quantitative Biology
30.	88	*Journal of Bacteriology
22	88	*Journal of Organic Chemistry
32.	88	Proceedings of the Royal Society
33.	84	*Biopolymers
34.	84	* European Journal of Blochemistry
36	81	* Journal of Clinical Investigation
37	70	"Journal of Clinical Investigation
38	69	Chemical Communications
30.	64	Advances in Enzymology
40	64	Advances in Enzymology
41	56	Consider Lournal of Chemistry
41.	50	timmunachamistry
42.	52	fournal of Linid Decearch
43.	52	Chaminaho Bariahta
	44	Chemische Derichte
45.	44	*Proceedings of the Society for Experimental Bloogy and Medicine
46.	40	Brookhaven Symposia in Biology
47.	40	*Endocrinology
48.	40	Helvetica Chimica Acta
49.	40	Journal of Medicinal Chemistry
50.	36	Journal of Neurochemistry