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"Current Comments"

1975 Life-Sciences Articles Highly Cited in 1975

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One of the problems facing science policy administrators is to know, at any given time, where the action is. For example, what were the papers published in 1975 that had the greatest impact? Recognizing the limitations imposed by taking citations only from the 1975 *Science Citation Index®* (*SCI®*) annual cumulation, we have compiled such a list of high-impact papers. In order to include even those papers published late in the year, we set our threshold at ten citations. As a result, we came up with a list of about 150 papers. About 100 of them had been cited eleven times or more. So we decided to list these in two sections. The first group are the 53 biomedical papers listed below. The remaining group of papers in chemistry and physics will appear next week.

Had we stuck to our usual procedure, we would have found that very few life sciences articles would be listed amongst the top fifty. Only seven of the papers below were cited 25 times or more in 1975. In the physical sciences, eleven papers achieved this rank. The 53 life sciences papers were cited an average of 16.1 times; the 49 chemistry and physics papers, 22.3 times.

All the papers listed below were published during the first five months of 1975. It is going to be necessary in the future to establish an even lower threshold to pick up papers published later in the year. This can be done and combined with data for the first quarterly *SCI* for 1976.

The papers listed appeared in only 21 different journals. Of these, four accounted for half: *Proceedings of the National Academy of Sciences USA* (8); *Nature* (7); *Science* (7); and *Cell* (5). *Biochemistry, Journal of Experimental Medicine,* and *New England Journal of Medicine* accounted for three each. The prominence of the new journal *Cell* is notable.

The most highly cited paper is item 10, by Furuichi et al. on the blocked 5'-terminal methylated structure of messenger RNA. He is the coauthor of five papers on the list (items 10, 11, 24, 30, 52). Indeed, ten of the articles concern this 'capped structure'. As explained to us by another coauthor, A.J. Shatkin of the Roche Institute, Nutley, N.J. (items 10, 38, 52), "One of the things that distinguishes messenger RNA from non-messenger RNA is this capped structure. Some RNAs don't have it and *aren't* messengers, and some

have it and *are* messengers. This is a way for the messenger to be identified as such by the proteins in the cell." The structure is called 'blocked' or 'capped' because its end, instead of being open, as in other RNAs, has an extra nucleotide group inversely oriented relative to the rest of the RNA. "The structure of the terminal nucleotide is reversed or inverted. We think there is a protein that recognizes this unique structure for protein synthesis." The capped structure was discovered near the end of 1974. According to Dr. Shatkin, "The capped structure may have something to do with regulation of genetic expression; why some messages are more efficiently translated than others. It may have something to do with the basic regulation of cell growth."[1] Papers 27, 47, 48 and 49 also concern this structure.

Ten papers deal with the physiopathology of certain disease states--two of them drug-related. Notable among this group are items 23 and 29 on the role of glucagon in diabetes. Of the remaining articles, the key title words are: lymphocyte, virus, immunology, chromatin, receptor.

Several of the papers were published in review journals, indicating not only the growing importance of such journals but also the rapidity of citation of significant review articles. Perhaps more scientists will keep this in mind when considering the value of investing time in this type of information activity.

1. **Shatkin A J.** Personal communication, March 1976.

1975 Life Sciences Articles Highly Cited in 1975

Item	Times Cited 1975	Bibliographical Data
1.	11	**Abramsky O, Aharonov A, Webb C & Fuchs S.** Cellular immune response to acetylcholine receptor-rich fraction, in patients with myasthenia gravis. *Clin. Exp. Immunology* **19**(1):11, 1975.
2.	12	**Ahkong Q F, Fisher D, Tampion W & Lucy J A.** Mechanisms of cell-fusion. *Nature* **253**(5488):194, 1975.
3.	23	**Baldwin J P, Boseley P G, Bradbury E M & Ibel K.** The subunit structure of the eukaryotic chromosome. *Nature* **253**(5489)245, 1975.
4.	13	**Bennett V, O' Keefe E & Cuatrecasas P.** Mechanism of action of cholera and the mobile receptor theory of hormone receptor adenylate cyclase interactions. *Proc. Nat. Acad. Sci. USA* **72**(1):33, 1975.
5.	12	**Cantor H, Simpson E, Sato V L, Garrison C & Herzenberg L A.** Characterization of subpopulations of T-lymphocytes. 1. Separation and functional studies of peripheral T-cells binding different amounts of fluorescent anti-Thy 12 (theta) antibody using a fluorescence activated cell sorter (FACS). *Cellular Immunology* **15**(1):180, 1975.

6. 11 **Child J J.** Nitrogen-fixation by a *Rhizobium sp.* in association with non-leguminous plant-cell cultures. *Nature* **253**(5490):350, 1975.

7. 11 **Creese I & Iversen S D.** Pharmacological and anatomical substrates of amphetamine response in the rat. *Brain Res.* **83**(3):419, 1975.

8. 19 **Dickson R C, Abelson J, Barnes W M & Reznikoff W S.** Genetic regulation; LAC control region. *Science* **187**(4171):27, 1975.

9. 27 **Fisher B et al.** 1-Phenylalanine mustard (L-PAM) in the management of primary breast cancer; a report of early findings. *New Engl. J. Med.* **292**(3):117, 1975.

10. 37 **Furuichi Y, Morgan M, Muthukrishnan S & Shatkin A J.** Reovirus messenger RNA contains a methylated, blocked 5'-terminal structure; $m^7G(5')_{ppp}(5')G^m{}_pC_p$.. *Proc. Nat. Acad. Sci. USA* **72**(1):362-66, 1975.

11. 27 **Furuichi Y & Miura K I.** A blocked structure at 5' terminus of *m*RNA from cytoplasmic polyhedrosis virus. *Nature* **253**(5490):374-5, 1975.

12. 26 **Gallagher R E & Gallo R C.** Type C RNA tumor virus isolated from cultured human acute myelogenous leukemia cells. *Science* **187**(4174):350-53, 1975.

13. 12 **Jacobson K & Papahadjopoulos D.** Phase-transitions and phase separations in phospholipid membranes induced by changes in temperature, pH, and concentration of bivalent cations. *Biochemistry* **14**(1):152, 1975.

14. 21 **Katz D H, Graves M, Dorf M E, DiMuzio H & Benacerraf B.** Interactions between histoincompatible T and B lymphocytes. 7. Cooperative responses between lymphocytes are controlled by genes in the *I* region of the *H-2* complex. *J. Exp. Med.* **141**(1):263-68, 1975.

15. 11 **Kirchner H, Muchmore A V, Chused T M, Holden H T & Herberman R B.** Inhibition of proliferation of lymphoma cells and T-lymphocytes by suppressor cells from spleens of tumor-bearing mice. *J. Immunology* **114**(1):206, 1975.

16. 13 **Lukes R J & Tindle B H.** Immunoblastic lymphadenopathy; hyperimmune entity resembling Hodgkins disease. *New Engl. J. Med.* **292**(1):1, 1975.

17. 11 **Meller E, Rosengarden H, Friedhoff A J, Stebbins R D & Silber R.** 5-Methyltetrahydrofolic acid is not a methyl donor for biogenic amines; enzymatic formation of folmaldehyde. *Science* **187**(4172):171, 1975.

18. 13 **Robinson H C & Tanford C.** Binding of deoxycholate, Triton X-100, sodium dodecyl-sulfate, and phosphatidylcholine vesicles to cytochrome B5. *Biochemistry* **14**(2):369, 1975.

19. 16 **Senior M B, Olins A L & Olins D E.** Chromatin fragments resembling nu bodies. *Science* **187**(4172):173, 1975.

20. 11 **Setalo G, Vigh S, Schally A V, Arimura A & Flerko B.** LH-RH-containing neural elements in rat hypothalamus. *Endocrinolog* **96**(1):135, 1975.

21. 15 **Thomas M & Davis R W.** Studies on cleavage of bacteriophage-lambda DNA with ecori restriction endonuclease. *J. Molecular Biology* **91**(3):315, 1975.

22. 15 **Traber J, Fischer K, Latzin S & Hamprecht B.** Morphine antagonizes action of prostaglandin in neuroblastoma and neuroblastoma-x-glioma hybrid cells. *Nature* 253(5487):120, 1975.

23. 16 **Unger R H & Orci L.** Essential role of glucagon in the pathogenesis of diabetes mellitus. *Lancet* 1(7897):14, 1975.

24. 20 **Urushibara T, Furuichi Y, Nishimura C & Miura K.** Modified structure at 5'-terminus of *m*RNA of vaccinia virus. *FEBS Letters* 49(3):385-89, 1975.

25. 14 **Wara D W, Goldstein A L, Doyle N E & Ammann A J.** Thymosin activity in patients with cellular immunodeficieny. *New Engl. J. Med.* 292(2):70, 1975.

26. 12 **Watson J.** Influence of intracellular levels of cyclic nucleotides on cell-proliferation and induction of antibody synthesis. *J. Exp. Med.* 141(1):97, 1975.

27. 33 **Wei C M & Moss B.** Methylated nucleotides block 5'-terminus of vaccinia virus messenger RNA. *Proc. Nat. Acad. Sci. USA* 72(1):318-22, 1975.

28. 21 **Davidson G P, Bishop R F, Townley R R W, Holmes I H & Ruck B J.** Importance of a new virus in acute sporadic enteritis of children. *Lancet* 1(7901):242-46, 1975.

29. 17 **Dobbs R, Sakurai H, Sasaki H, Faloona G, Valverde I, Baetens D, Orci L & Unger R.** Glucagon; role in hyperglycemia of diabetes mellitus. *Science* 187(4176):544, 1975.

30. 19 **Furuichi Y, Muthukrishnan S & Shatkin A J.** 5'-Terminal $m^7G(5')_{ppp}(5')G^m{}_pC_p$- *in vivo;* identification in reovirus genome RNA. *Proc. Nat. Acad. Sci. USA* 72(2):742, 1975.

31. 11 **Katz D H & Benacerraf B.** Function and interrelationships of T-cell receptors, IR genes and other histiocompatibility gene products. *Transplantation Rev.* 22:175, 1975.

32. 11 **Khoury G, Howley P, Nathans D & Martin M.** Posttranscriptional selection of simian virus-40-specific RNA. *J. Virology* 15(2):433, 1975.

33. 15 **Manning J E, Schmid C W & Davidson N.** Interspersion of repetitive and nonrepetitive DNA sequences in *Drosophila melanogaster* genome. *Cell* 4(2):141, 1975.

34. 11 **Murgita R A & Tomasi T B.** Suppression of immune response by alpha-fetoprotein on primary and secondary antibody response. *J. Exp. Med.* 141(2):269, 1975.

35. 11 **Oosterhof D K, Hozier J C & Rill R L.** Nuclease action on chromatin; evidence for discrete, repeated nucleoprotein units along chromatin fibrils. *Proc. Nat. Acad. Sci. USA* 72(2):633, 1975.

36. 11 **Provost P J, Wolanski B S, Miller W J, Ittensohn O L, McAleer W J & Hilleman M R.** Physical, chemical, and morphologic dimensions of human hepatitis A virus strain CR326. *Proc. Soc. Exp. Biol. Med.* 148(2):532, 1975.

37. 14 **Sharma S K, Nirenberg M & Klee W A.** Morphine receptors as regulators of adenylate cyclase activity.
Proc. Nat. Acad. Sci. USA 72(2):590, 1975.

38. 20 **Both G W, Banerjee A K & Shatkin A J.** Methylation-dependent translation of viral messenger RNAs *in vitro*.
Proc. Nat. Acad. Sci. USA 72(3):1189-93, 1975.

39. 19 **Griffith J D.** Chromatin structure; deduced from a minichromosome. *Science* 187(4182):1202-03, 1975.

40. 12 **Howard J G & Mitchison N A.** Immunological tolerance.
Progr. Allergy 18:43-96, 1975.

41. 11 **McCann J, Spingarn N E, Kobori J & Ames B N.** Detection of carcinogens as mutagens; bacterial tester strains with r-factor plasmids. *Proc. Nat. Acad. Sci. USA* 72(3):979-83, 1975.

42. 13 **Martinson H G & McCarthy B J.** Histone-histone associations within chromatin; crosslinking studies using tetranitromethane.
Biochemistry 14(5):1073, 1975.

43. 12 **Noll M, Thomas J O & Kornberg R D.** Preparation of native chromatin and damage caused by shearing. *Science* 187(4182):1203, 1975.

44. 12 **Wright P.** Untoward effects associated with Practolol administration; oculomucocutaneous syndrome. *Brit. Med. J.* 1(5958):595, 1975.

45. 22 **Oudet P, Gross-Bellard M & Chambon P.** Electron microscopic and biochemical evidence that chromatin structure is a repeating unit. *Cell* 4(4):281-300, 1975.

46. 12 **Perry R P, Kelley D E, Friderickson K & Rottman F.** Methylated constituents of L cell messenger RNA; evidence for an unusual cluster at 5'-terminus. *Cell* 4(4):387-94, 1975.

47. 14 **Wei C M. Gershowitz A & Moss B.** Methylated nucleotides block 5'-terminus of HELA cell messenger RNA. *Cell* 4(4):379-86, 1975.

48. 11 **Abraham G, Rhodes D P & Banerjee A K.** 5'-Terminal structure of methylated messenger RNA synthesized by vesicular stomatitis virus. *Cell* 5(1):51-58, 1975.

49. 22 **Adams J M & Cory S.** Modified nucleosides and bizarre 5'-termini in mouse myeloma *n*RNA. *Nature* 255(5503):28-33, 1975.

50. 16 **Hughes J.** Isolation of an endogenous compound from brain with pharmacological properties similar to morphine.
Brain Res. 88(2):295-308, 1975.

51. 12 **Mann J I, Vessey M P. Thorogood M & Doll R.** Myocardial infarction in young women with special reference to oral contraceptive practice. *Brit. Med. J.* 2(5965):241-45, 1975.

52. 19 **Muthukrishnan S, Both G W, Furuichi Y & Shatkin A J.** 5'-Terminal-7-methylguanosine in eukaryotic messenger RNA is required for translation. *Nature* 255(5503):33-37, 1975.

53. 33 **Shreffler D C & David C S.** The *H-2* histocompatibility complex and the *I* immune response region; genetic variation, function, and organization. *Adv. Immunology* V20:125-95, 1975.