

Stein G S, Spelsberg T C & Kleinsmith L J. Nonhistone chromosomal proteins and gene regulation. *Science* 183:817-24, 1974.

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This review article summarizes the involvement of chromosomal proteins in the structural and functional properties of the eukaryotic genome. [The SCI® indicates that this paper has been cited in over 485 publications since 1974.]

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"In the early 1970s, considerable attention was focused on the nonhistone chromosomal proteins. Although it had for some time been established that the eukaryotic genome is a nucleoprotein complex consisting of DNA and two classes of chromosomal proteins, histone and nonhistone proteins, previous efforts had been largely directed toward the structural and functional properties of DNA and histones. In July 1972, the first Gordon Research Conference on Chromosomal Proteins was held at Beaver Dam, Wisconsin. From the work presented at this meeting and from the scientific literature, it was becoming apparent that the nonhistone proteins constituted a complex and heterogeneous class of molecules that could influence the packaging of DNA, enzymatic reactions that occur at the level of the genome, and the expression of encoded genes.

"It was at this Gordon Research Conference that several colleagues encouraged Lew Kleinsmith, Tom Spelsberg, and me to write a review article for *Science* on the nonhistone proteins. The absence of a recent review on this topic and the growing interest in the nonhistone proteins led us to make the decision that we would write the article. During the course of that summer, several lengthy telephone conversations took place in conjunction with outlining the article. Then, after exchanging several versions of preliminary drafts, we got together that September in Ann Arbor, Michigan, to write the final manuscript. To us, this was an extremely rewarding experience. It provided three young investigators with an opportunity to assess the development of an area, both from a historical perspective and with respect to directions in which the field was going. Additionally, we were able to relate our studies on the nonhistone proteins to the studies of many other colleagues in this field.

"Why has this paper been frequently cited? We believe that the explanation resides largely in the general coverage of a topic previously not reviewed in a comprehensive manner. This has been coupled with an intense interest in the chromosomal proteins by a broad spectrum of scientists.

"It has been rather gratifying to have followed research on chromosomal proteins during the 12 years subsequent to writing this review.¹⁻⁸ With the advent of recombinant DNA technology whereby the functional interactions of chromosomal proteins with specific genes are now being examined, our understanding of how the nonhistone proteins mediate gene structure and gene expression is rapidly increasing."

1. Izenberg I. Histones. *Annu. Rev. Biochem.* 48:159-91, 1979. (Cited 230 times.)
2. McGhee J D & Felsenfeld G. Nucleosome structure. *Annu. Rev. Biochem.* 49:1115-56, 1980. (Cited 365 times.)
3. Felsenfeld G & McGhee J. Methylation and gene control. *Nature* 296:602-3, 1982. (Cited 80 times.)
4. Welsbrod S. Active chromatin. *Nature* 297:289-95, 1982. (Cited 125 times.)
5. Elgin S C R & Weisstraub H. Chromosomal proteins and chromatin structure. *Annu. Rev. Biochem.* 44:725-74, 1975. (Cited 565 times.)
6. Kornberg R D. Structure of chromatin. *Annu. Rev. Biochem.* 46:931-54, 1977. (Cited 760 times.)
7. Stein G S & Kleinsmith L J, eds. *Chromosomal proteins and their role in the regulation of gene expression: proceedings of the Florida Colloquium on Molecular Biology, March 13-14, 1975.* New York: Academic Press, 1975. 307 p.
8. Stein G S, Stein J L & Kleinsmith L J. Non-histone proteins and gene regulation. (MacClean N, Gregory F P & Flavell R A, eds.) *Eukaryotic genes: their structure, activity and regulation.* London: Butterworths, 1983. p. 31-52.