

This Week's Citation Classic®

Antonini E & Brunori M. *Hemoglobin and myoglobin in their reactions with ligands.* Amsterdam, The Netherlands: North-Holland, 1971.
[Center of Molecular Biology of C.N.R., Institute of Biochemistry, and Regina Elena Institute for Cancer Research, Rome, Italy]

This book presents a comprehensive account of knowledge on the structure and function of hemoglobin and myoglobin and of the models and theories proposed to account for their ligand binding properties. [The SC¹® indicates that this book has been cited in more than 990 publications.]

The Fascination of Hemoglobin: A Roman Perspective

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Antinori is a well-known brand of Chianti wine; but within a small group of hemoglobinologists, close in science and life to the Rome group, it was shorthand for Antonini-Brunori. My association with Eraldo Antonini started in 1958 at the Regina Elena Institute and continued happily at the Biochemistry Institute directed by Professor Rossi Fanelli.

Summarizing the major incentives behind our decision to write a whole volume on hemoglobin is nowadays difficult and perhaps artificial, but some of the motivations can probably be singled out. We found the old book by R. Lemberg and J.W. Legge¹ very useful; but a comprehensive volume conveying all the new fundamental knowledge on hemoglobin (which meanwhile had enjoyed a unique and unprecedented explosion) was needed.

We were deep into the subject after 10 years of dedicated work. J. Wyman (in Rome since 1961) had provided the theoretical background and the international visibility, which proved so stimulating. A series of informal meetings on hemoglobin (called La Cura Conferences), with endless discussions within a small group of scientists, was an important ingredient in catalyzing our determination.

A plan of the book was prepared early in 1966, and the first complete draft was available before Christmas of 1968. The division of labor between Eraldo and me was handled very naturally, like all other events of our

scientific collaboration, which continued until his death in 1983.

I remember particularly the summer of 1968. Eraldo went sailing with his gigantic catamaran, and, despite his love for the sea, he worked hard on the book. I went to the mountains with the family and took the manuscript along; a rainy season in the Dolomites helped my writing. At that point, however, we felt fatigue, partly because the experimental work was also progressing at a rapid pace. The following year, the preparation of a review article² provided new momentum and fresh literature and led to the final rush.

When the volume appeared on the shelf, it was well equipped with very recent work; even a 1970 seminal paper by M.F. Perutz on the structural interpretation of the allosteric behavior of hemoglobin was included. The book was presented (so to speak) at a meeting held in Paris in June 1971; I remember that our only copy was donated to a Russian friend who had anticipated some difficulties in the USSR.

The success of the book was no doubt related to its timeliness. Hemoglobin has always been a unique system for basic questions about structure-function relationships in proteins and for understanding biological regulation at the molecular level. Subsequent developments in the biophysics, genetics, pathophysiology, and evolution of hemoglobin are the best proof of this continuing interest.³⁻⁵

The volume, presenting in a relatively compact form a large body of information (both experimental and theoretical) on this fascinating protein, filled a gap and served the purpose of "Introducing beginners to the study of Hb function"; it is still widely used in many laboratories around the world.

Its impact on our scientific life has been very significant, and it is felt even today. In 1974, Eraldo was awarded the Feltrinelli Prize of the Accademia Nazionale dei Lincei, and I have since been elected to the academy; no doubt the book was an important element in those events.

1. Lemberg R & Legge J W. *Hematin compounds and bile pigments: their constitution, metabolism, and function.* New York: Interscience, 1949. 748 p. (Cited 775 times.)
 2. Antonini E & Brunori M. Hemoglobin. *Annu. Rev. Biochem.* 39:977-1042, 1970. (Cited 100 times.)
 3. Dickerson R E & Geis I. *Hemoglobin: structure, function, evolution and pathology.* Menlo Park, CA: Benjamin/Cummings. 1983. (Cited 225 times.)
 4. Perutz M F. Mechanisms of cooperativity and allosteric regulation in proteins. *Quart. Rev. Biophys.* 22:139-236, 1989.
 5. Eaton W A & Hofrichter J. Sick cell hemoglobin polymerization. *Advan. Prot. Chem.* 40:63-279, 1990.
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