Welcome guests to the RNA world: proteins that interact with RNA

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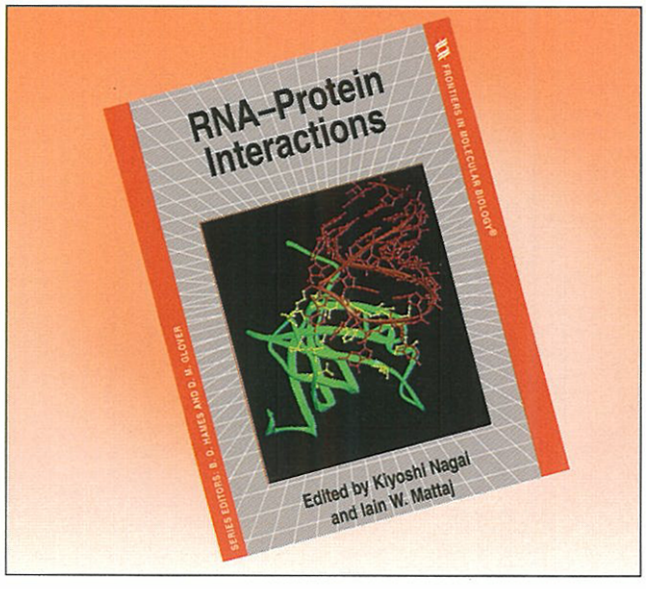
RNA–Protein Interactions edited by Kiyoshi Nagai and Iain W Mattaj. IRL Press, 1994, 272 pages. $96.00 hardcover (ISBN 0-19963-505-6); $46.00 paperback (ISBN 0-19963-504-8).



The central role of RNA in the molecular biology of information transfer from DNA to protein has been well established. RNA is literally and figuratively everywhere in this process: from the nucleus to the cytoplasm, in the form of messenger RNA, transfer RNA or ribosomal RNA. The discovery of catalytic RNA has stressed the importance of RNA for functions such as messenger RNA splicing and protein synthesis by the ribosome. Yet equally important in these processes are the myriad proteins that interact with RNA and modulate its function. The two major RNA-containing cellular machines, the ribosome and the spliceosome, are RNA–protein complexes. Proteins bind to messenger RNAs in both a specific and non-specific manner, and regulate such processes as transport, splicing and RNA degradation. Despite the crucial importance of RNA–protein interactions to biology, it has been only recently that structural studies have begun to reveal the origins of RNA recognition by proteins.

The current state of knowledge in the field is thoroughly reviewed in *RNA–Protein Interactions*, edited by Kiyoshi Nagai and Ian W Mattaj. This book covers an impressive array of topics, which are normally pigeonholed into more specific areas of research. It was refreshing to see such diverse subjects as RNA structure, aminoacyl-tRNA synthetases, ribosomal proteins and *in vitro* selection discussed in a single volume. The editors have assembled 11 chapters by an all-star cast of scientists, which cover the physical and biochemical techniques used to study RNA–protein interactions, and the results obtained on different classes of RNA-binding proteins.

The initial chapters address the current knowledge of RNA secondary and tertiary structure, and how techniques such as NMR and computer modeling can be applied to RNA structure determination. This is very appropriate since the complex three-dimensional structure of RNA is central in protein recognition. It continues with individual chapters that discuss discrete categories of RNA-binding proteins: aminoacyl–tRNA synthetases, ribosomal proteins, the C5 protein of RNase P, hnRNPs, proteins that interact with small nuclear RNAs, transcription factor IIIA and retroviral regulatory proteins. It finishes with a discussion of *in vitro* selection techniques and their application to RNA–protein interactions. The chapters are unified by an underlying desire to understand the elements within both the RNA and protein required for recognition. I found the chapters to be quite thorough and well referenced, and, in general, written at a level to appeal to both experts in the field and newcomers who have seen the light. If there is a defect in this book, it is the omission of chapters discussing viral coat proteins and a comparison of DNA–protein interactions and RNA–protein interactions; discussion of these topics would have been useful for completeness.

The editors and authors should be commended for this admirable text. It captures the breadth and complexity of RNA–protein recognition for the first time, and represents a challenge for the future. The editors themselves realize the built-in flaw of this volume — the fast pace of research in the field. The volume is not outdated, however, and is strongly recommended for researchers in the field, both students and their teachers. I wait in keen anticipation of the breakthroughs to come, and the second edition of *RNA–Protein Interactions*.

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