Translation In Eukaryotes

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PREFACE

The synthesis of a protein is a multi-step biochemical pathway in which numerous components such as RNAs, proteins and small molecules cooperate to translate the nucleotide sequence of an RNA into the corresponding amino acid sequence of the protein. Several steps in this pathway are regulated and for a number of genes regulation at the level of translation contributes significantly to overall regulation of their expression.

Translation in eukaryotes has been studied in many laboratories and for more than twenty years biochemical methods were mainly used. These include the preparation of cell-free extracts competent for *in vitro* translation, fractionation of translational components, and reconstitution of translation systems from purified components. More recently, genes encoding translational components were cloned and genetic and molecular genetic methods were introduced to study the mechanism and regulation of eukaryotic translation. This opened the door for studies of translation at the molecular level *in vivo*. Important contributions to our understanding of eukaryotic translation are also more and more often made by investigators studying the expression of their gene of interest and finding themselves studying a translational phenomenon. These developments have led to rapid accumulation of new data and make it increasingly difficult to keep up with the literature.

This multi-author book was written for students, newcomers in the field, and others interested in obtaining overviews of specific aspects of eukaryotic translation in the form of short reviews. (The authors restrict themselves to the description of concepts and main findings and give references for the study of details.) Therefore this book should serve the reader as a guide to the vast amount of literature in this field. In order to keep the chapters short and to limit their content of information, aspects of mechanism of translation (Part I) were separated from aspects of regulation of translation (Part II) and special aspects such as comparison of eukaryotic and prokaryotic translation, mode of action of inhibitors and nomenclature of initiation factors asre treated in Part III.

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Part

I

Mechanism of Translation