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Nota di contenuto	A Comparative Perspective on Ribosome Biogenesis: Unity and Diversity across the Tree of Life -- Establishment and Maintenance of Open Ribosomal RNA Gene Chromatin States in Eukaryotes -- Analysis of Yeast RNAP I Transcription of Nucleosomal Templates In Vitro -- Specialization of RNA Polymerase I in Comparison to Other Nuclear RNA Polymerases of <i>Saccharomyces cerevisiae</i> -- Structural Studies of Eukaryotic RNA Polymerase I using Cryo-Electron Microscopy -- Preparation of RNA Polymerase Complexes for their Analysis by Single Particle Cryo-Electron Microscopy -- Eukaryotic Ribosome Assembly and Nucleo-Cytoplasmic Transport -- Tethered MNase Structure Probing as Versatile Technique for Analyzing RNPs using Tagging Cassettes for Homologous Recombination in <i>Saccharomyces cerevisiae</i> -- Chemical Modifications of Ribosomal RNA -- In Vitro Selection of Deoxyribozymes for the Detection of RNA Modifications -- Mapping of the Chemical Modifications of rRNAs -- Non-Radioactive In Vivo Labelling of RNA with 4-thio-uracil -- Translation Phases in Eukaryotes -- Differential Translation Activity using Bio-Orthogonal Non-Canonical Amino Acids Tagging (BONCAT) in Archaea -- Thermofluor-Based Analysis of Protein Integrity and Ligand Interactions -- In Vitro Assembly of a Fully Reconstituted Yeast Translation System for Studies of Initiation and Elongation Phases of Protein Synthesis.

This Open Access volume provides comprehensive reviews and describes the latest techniques to study eukaryotic ribosome biogenesis. For more than 50 years ribosomes are a major research topic. Our knowledge about ribosome biogenesis and function such as transcription, mRNA modification, and translation was the sine qua non for developing the powerful RNA-based vaccines against RNA-viruses causing the world-threatening Covid-19 pandemic. The chapters in this book are organized into six parts. Part One discusses a comparative survey about the unity and diversity of ribosome biogenesis in pro- and eukaryotic cells. Part Two deals with the genomic organization of eukaryotic rDNA and the role of RNA polymerase I in ribosomal RNA transcription. Part Three explores in vitro methods to study RNA polymerase I structure and its function, and Part Four analyzes the nucleo-cytoplasmic transport of assembled ribosomes and RNP complexes. Part Five covers modifications that increase the complexity of rRNAs, and Part Six provides readers with a review of eukaryotic translation and - for the first time - describes a new method to analyze translation in vitro. Written in the highly successful Methods in Molecular Biology series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Cutting-edge and comprehensive, Ribosome Biogenesis: Methods and Protocols is a valuable resource for scientists and researchers interested in learning more about the increasing importance of in vitro RNA-technologies.

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