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THE INITIATION OF DNA REPLICATION

edited by
DAN S. RAY

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PREFACE

One of the most precisely regulated events in living cells is the initiation of DNA replication. Initiation occurs at one or more sites called replication origins. In general, chromosomes of prokaryotic cells and their phages and plasmids have a single unique origin, while eukaryotic cells have multiple origins per chromosome. Recognition of the nucleotide sequence of an origin by specific proteins is likely to be crucial in regulating initiation.

Through the use of recombinant DNA techniques, various replication origins and replication determinants have been cloned and are now available in large amounts for both genetic and biochemical analysis. Tremendous progress has also been made in the purification of replication proteins. In the case of *E. coli*, the availability of large quantities of small phage chromosomes has facilitated the purification of the components of three distinct initiation systems. The rapid progress in these areas has now set the stage for detailed genetic and biochemical analysis of these critically important regulatory mechanisms.

Because considerable progress has been made with a variety of systems ranging from phage and plasmids to eukaryotic viruses and chromosomal segments, it seemed appropriate to bring together workers from diverse areas concerned with regulation of initiation. It was our hope that we could begin to address some of the unanswered questions in this area: Are there specific protein recognition sites within an origin? How many proteins interact at an origin and do they interact in a specific temporal sequence? Can origins be subdivided into distinct functional domains? Are there similar mechanisms of initiation in diverse biological systems? What are the specific biochemical steps in DNA chain initiation and how are they catalyzed?

This volume includes articles from plenary session speakers and poster presentations. The papers are arranged in groups according to their organization in the meeting. The meeting was held in March 1981 at Salt Lake City, Utah, and was one of the 1981 ICN–UCLA Symposia on Molecular and Cellular Biology. The series, spon-

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