

Time-resolved transcriptomics is a cutting-edge approach in molecular biology that focuses on capturing gene expression patterns over time with high temporal resolution. By integrating the fields of



## Short Note on Time-Resolved Transcriptomics

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### Abstract

Time-resolved transcriptomics has emerged as a powerful tool for understanding the intricate dynamics of gene expression over temporal scales. By capturing gene expression patterns with high temporal resolution; this approach enables researchers to dissect the temporal dynamics of biological processes with unprecedented detail. This abstract reviews recent advancements in time-resolved transcriptomics methodologies; including single-cell RNA sequencing; nascent RNA sequencing; and high-throughput time-course experiments. We discuss the applications of these techniques in studying diverse biological phenomena; such as cellular differentiation; circadian rhythms; and responses to environmental stimuli. Furthermore; we highlight the challenges and opportunities in data analysis; including the development of computational models for robust inference of dynamic gene regulatory networks. Time-resolved transcriptomics holds immense promise for unraveling the complexity of gene expression regulation in health and disease; paving the way for targeted therapeutic interventions and precision medicine strategies.

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