

Preface

The discovery of RNA interference and their endogenous mediators, microRNAs, has revolutionized molecular biology in the past two decades. Beside their obvious biological relevance, microRNAs can also be exploited as biomarkers and even as potential therapeutic targets. One of the most recent developments of microRNA research was the recognition of secreted microRNA that can be detected in body fluids, most importantly in the blood. Circulating blood-borne microRNAs might represent a novel, minimally invasive diagnostic tool that might be exploited in many diseases. However, there are major technical difficulties to be conquered, and standardization of analytical methods is needed for their successful clinical introduction. The biological relevance of circulating microRNAs is intriguing as this might represent a form of paracrine or even endocrine (hormonal) communication that would convey epigenetic information to cells or tissues distant from the microRNA-secreting source.

This book focuses on this fascinating and rapidly developing research field. Both researchers and students of biology or medicine could find this topic interesting.

This book comprises 3 parts including 14 chapters altogether. The first part composed of three chapters presents the molecular features and biological relevance of both tissue and circulating microRNAs, and the technical difficulties of circulating microRNA analysis are also discussed. The second, largest part attempts to present an overview of the potential diagnostic relevance of circulating microRNAs as minimally invasive biomarkers in various diseases such as solid and hematologic tumors, cardiovascular diseases, systemic autoimmune diseases, inflammatory bowel disease, and diabetes. The third part deals with potential biological effects of circulating microRNAs including experimental findings and also hypotheses on their potential relevance. Due to the vast number of recent research papers published on circulating microRNAs, it is impossible to include all findings in a book. We have therefore tried to select the most relevant or most interesting aspects of circulating microRNA research focusing on potential biomedical relevance.

I hope that the reader will find this topic exciting and interesting, and the pieces of information included in the book would be helpful to anyone trying to be taken up with this fascinating field of biomedicine.

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