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## Preface

Since its invention and subsequent development nearly 20 years ago, polymerase chain reaction (PCR) has been extensively utilized to identify numerous gene probes in vitro and in vivo. However, attempts to generate complete and full-length complementary cDNA libraries were, for the most part, fruitless and remained elusive until the last decade, when simple and rapid methods were developed. With current decoding and potential application of human genome information to genechips, there are urgent needs for identification of functional significance of these decoded gene sequences. Inherent in bringing these applications to fruition is the need to generate a complete and full-length cDNA library for potential functional assays of specific gene sequences.

*Generation of cDNA Libraries: Methods and Protocols* serves as a laboratory manual on the evolution of generation of cDNA libraries, covering both background information and step-by-step practical laboratory recipes for which protocols, reagents, operational tips, instrumentation, and other requirements are detailed. The first chapter of the book is an overview of the basics of generating cDNA libraries, which include the following: (a) the definition of a cDNA library, (b) different kinds of cDNA libraries, (c) differences between methods for cDNA library generation using conventional approaches and novel strategies, including reverse generation of RNA repertoires from cDNA libraries, and (d) the quality of cDNA libraries. In subsequent chapters, various methods are presented to provide the reader with a wide range of methodologies for enhancing the generation of complete and full-length libraries. Again, each method of cDNA library generation contains a balanced presentation of both background information and practical procedures. The remainder of this book explains how to confirm the quality of the cDNAs generated and some of the applications, including (a) electrophoresis, (b) Northern blotting, (c) microarray analysis, (d) subtractive hybridization, (e) subtractive cloning, (f) gene cloning, and (g) peptide library generation.

The final chapter of the book outlines the future use of full-length cDNA libraries in biomedical research, diagnostic utilization, drug development, and clinical therapy.

The authors contributing the various chapters are all experts in their fields, and they have either developed and/or routinely performed the methodologies

described herein. It is anticipated that the subject matter covered in *Generation of cDNA Libraries: Methods and Protocols* will be particularly useful for biologists, biochemists, molecular biologists, and clinicians, which would furnish them several ready-to-use methodologies for attacking the problems in their specific areas of interests.

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