

Preface

When I first gave lectures on RNA interference (RNAi), I was asked by many scientists, "What is the meaning of 'interference'?", and "How does RNA fit into this phenomenon, which has long been recognized by physicists?" Even if the two phenomena appear to have nothing in common, the physical definition of interference can be easily converted to fit RNAi:

"Interference is the process in which waves (RNAs) of the same frequency (sequence) combine to reinforce or cancel (delete) each other".

With their discovery that double-stranded RNA (dsRNA) can efficiently delete homologous mRNA in *Caenorhabditis elegans*, Craig Mello and Andrew Fire commenced a new era on gene silencing and created a major "hype" in the scientific community. Since then, a flood of reports has been published describing vast amounts of data and many techniques for performing RNAi in many organisms and, as a therapeutical tool, making it almost impossible to follow up the basic and striking news. *RNA Interference in Practice* is targeted at all scientists – including students, novices, and regular users of RNAi – who wish either to apply or to expand the use of RNAi in their laboratories.

RNA Interference in Practice is the most recent issue of the successful "... in Practice" series published by Wiley-VCH. As with previous issues such as *Proteomics in Practice* and *Electrophoresis in Practice*, this book contains a comprehensive theoretical introduction to guide the user through the practical protocols employed. These protocols are supported by many notes that lead to improvements of the procedures. The success of the other books of the "... in Practice" series has shown that laboratory manuals comprising both theory and practice serve as useful guides for daily laboratory investigations. Although the present book will doubtless never be completed due to the rapid development of RNAi research, it will nonetheless provide scientists with a summary of current literature up to 2004, the basic techniques of RNAi, and the common drawbacks for the successful application of RNAi in worms, flies, and mammals.

What are the prerequisites for a successful RNAi experiment? Success depends not only on knowledge of the mechanisms themselves, but also on the technical requirements and limitations of the practical applications. One challenge for every scientist is to evaluate critically the methods described in the primary literature or in the manufacturer's manuals. Therefore, this book – in one issue – comprises critical

steps, from the design of siRNAs or dsRNAs to the delivery into the respective organism, and the design of important controls. It further describes cloning strategies of hairpin constructs, analytical tools, and many new perspectives. Each chapter contains appendices with useful web sites, book and literature references, together with company addresses. A comprehensive glossary is also provided for the reader. Most of the protocols have been carried out in our laboratory, and are being constantly updated. *RNA Interference in Practice* differs from other books on the subject of RNAi in as much it is has been created especially for use at the bench, thus facilitating daily laboratory studies. My aim is to encourage readers of the book to stroll through all of its chapters, as there is much to learn from RNAi in different organisms, and this in turn might inspire the creation of novel experimental set-ups.

Finally, I would like to thank all of those people who provided me with constant encouragement during the writing of this book. I would like to thank Frank Weinreich of Wiley-VCH for his great patience and continuous motivation. Likewise, the production of this book would not have been possible without the constant support of my mentor Konrad Sandhoff and my co-workers, who developed and tested most of the protocols and designed the wonderful illustration for the book's cover, and especially Katja Schmitz, who was always there when I needed a helping hand or fruitful criticism. Last - but not least - I cannot close without thanking my husband S. Braese and my family for criticising and pampering me during the exciting experience of writing a book.

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