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EDITORIAL

Introduction

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RNA interference (RNAi) is an important biological process for modulating gene expression. From being named *Science*'s 'Breakthrough of the Year' in 2002, advances in our understanding of the natural role of RNAi in a range of cellular processes, both protective and destructive, have revealed the potential for a novel class of drugs based on small, inhibitory RNAs and their derivatives. Recently, investigators' have capitalized on the cells natural ability to repress gene expression via RNAi to silence target genes *in vitro*, in tissues, and in whole organisms.

In just several years, RNAi has moved to the mainstream as a tool for the bench scientist to understand gene function or validate therapeutic targets. Recent bioinformatic tools available on the public domain or from commercial vendors streamline the generation and application of RNAi to specific experimental applications.

The purpose of this compendium is to provide the reader with the current palette of issues confronting scientists performing RNAi-based experiments, and present possible solutions. Designing inhibitory RNAs, and approaches to minimize unintended effects on non-target gene expression are discussed. Also, practical aspects for delivery of RNAi to cells *in vitro* or different cell targets *in vivo* are reviewed, with attention to viral and non-viral methodologies for achieving silencing. While a comprehensive list of 'how-to' experiments for accomplishing RNAi in all cell types and possible target organs is not the intent of this issue of *Gene Therapy*, the approaches described to inhibit viral pathogens, dominant disease genes, micro-RNAs involved in disease, or disease-specific alleles may be broadly applicable to a variety of experimental systems.

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