Advances in RNAi: Design, Synthetics, and Vectors

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There have been many advances in RNA interference technology since Thomas Tuschl's first demonstration of siRNA-mediated knockdown in mammalian cell culture. Algorithms for the design of RNAi reagents have increased their average potency and reduced the number of molecules that must be screened. Pre-validated reagents are available that eliminate design issues altogether. Meanwhile, standard siRNA's are being replaced by modified versions (Stealth™ RNAi) that have greater stability and fewer off-target effects. The development of RNAi plasmid vectors has opened the realms of regulated expression and viral delivery. These modified RNA oligonucleotides and novel RNAi vectors promise to provide researchers better technologies to move from in vitro RNAi applications to useful in vivo models. What was once an uncertain but promising technology is now an integral and powerful part of the functional genomics researcher's toolbox.