Promising new 'antigene' therapy

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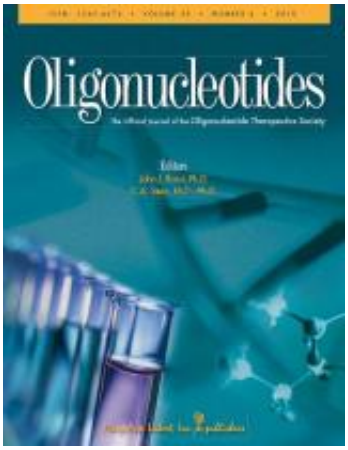

Oligonucleotides, edited by John Rossi, Ph.D., and C.A. Stein, M.D., Ph.D., from the Department of Oncology at Albert Einstein-Montefiore Cancer Center, is an authoritative, peer-reviewed journal published 6 times a year in print and online that focuses on synthetic oligonucleotides, including RNA, DNA, and ribozymes, and their effects on gene expression at the RNA and DNA levels both in vitro and in vivo. It represents a forum for basic research and applied therapeutics for the purpose of developing new concepts and experimental approaches to understanding and modulating gene activity. *Oligonucleotides* is the official journal of the Oligonucleotide Therapeutics Society (http://www.myots.org). Tables of content and a free sample issue may be viewed online at www.liebertpub.com/oli. Credit: Mary Ann Liebert Inc., publishers

Antigene therapy is a promising new treatment strategy that uses a DNA-based drug to pinpoint light energy to a target gene shutting down its activity. A review article published online ahead of print in *Oligonucleotides*, a peer-reviewed journal published by Mary Ann

Liebert, Inc., details the possibilities and challenges for the clinical application of this novel photo-activated DNA modulating approach.

Netanel Kolevzon and Eylon Yavin, from The Hebrew University of Jerusalem (Israel), describe the mechanism behind antigene therapy in the article "Site-Specific DNA Photocleavage and Photomodulation by Oligonucleotide Conjugates." They review the development of triplex-forming DNA-based drugs capable of up-regulating or inhibiting gene expression in a highly targeted and selective manner.

Unlike existing antisense therapies that target RNA, an antigene drug is a triplex-forming oligonucleotide that recognizes and attaches directly to a specific DNA sequence. By attaching a photoreactive agent to the antigene and delivering light energy to the attachment site, the light-sensitive drug complex becomes activated, triggering a cleavage or cross-linking reaction. This photo-induced, site-specific DNA damage effectively silences the gene target.

"Many obstacles lay ahead before this approach may reach the clinic," caution the authors. However, if antigene therapy proves successful at blocking gene activity, "many diseases that are currently incurable or otherwise treatable with limited success could be potentially relevant targets for such an approach," they conclude.

"This is a clever and potentially powerful approach to targeted regulation of gene expression," says John Rossi, PhD, Co-Editor-in-Chief of *Oligonucleotides* and Professor in the Department of Molecular Biology, Beckman Research Institute of the City of Hope (Duarte, CA).

More information: The article is available free online at www.liebertpub.com/oli

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