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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction -- RNA Nanotechnology: methods for synthesis, conjugation, assembly and application of RNA nanoparticles -- Adsorption of double-stranded DNA to graphene oxide preventing enzymatic digestion -- Electrogenerated chemiluminescence of conjugated polymer films from patterned electrodes -- Use of RNA structure flexibility data in nanostructure modeling -- Informatic resources for identifying and annotating structural RNA motifs -- A nanostructure made of a bacterial noncoding RNA -- HAPIscreen, a method for high-throughput aptamer identification -- Characterization of photophysical and base-mimicking properties of a novel fluorescent adenine analogue in DNA -- Bifacial nucleoside as a surrogate for both T and A in duplex DNA -- Functionally important structural elements of U12 snRNA -- Self-assembling RNA nanorings based on RNAI/II inverse

kissing complexes -- Automatic molecular weaving prototyped by using single-stranded DNA -- Nucleic Acid Aptamers: Clinical Applications and Promising New Horizons -- Nanotextured Substrates With Immobilized Aptamers for Cancer Cell Isolation and Cytology -- Targeting cancer with peptide aptamers -- Synthetic, biofunctional nucleic acid-based molecular devices -- Inducible site-selective bottom-up assembly of virus-derived nanotube arrays on RNA-equipped wafers -- Special delivery: targeted therapy with small RNAs, RNAi nanomedicines: challenges and opportunities within the immune system -- Pyrene-functionalized oligonucleotides and locked nucleic acids (LNAs): Tools for fundamental research, diagnostics, and nanotechnology -- Stabilizing RNA by the sonochemical formation of RNA nanospheres. Sonochemical synthesis of DNA nanospheres -- Nucleic acid based molecular devices -- Nanoparticle therapeutics: FDA approval, clinical trials, regulatory pathways, and case study -- A sol-gel-based microfluidics system enhances the efficiency of RNA aptamer selection -- Hierarchical nanotextured microelectrodes overcome the molecular transport barrier to achieve rapid, direct bacterial detection -- Recent developments in lipid-based pharmaceutical nanocarriers -- Targeted delivery of RNAi therapeutics for cancer therapy -- DNAsomes: Multifunctional DNA-based nanocarriers -- Reversible and Controllable Nanolocomotion of an RNA-Processing Machinery -- Scavenger receptors mediate cellular uptake of polyvalent oligonucleotide-functionalized gold nanoparticles -- A highly sensitive microRNA biosensor based on ruthenium oxide nanoparticle-initiated polymerization of aniline -- Preparation and high-resolution microscopy of gold cluster labeled nucleic acid conjugates and nanodevices -- Kinetically grafting G-quadruplexes onto DNA nanostructures for structure and function encoding via a DNA machine -- Synthesis of glycerol nucleic acid (GNA) phosphoramidite monomers and oligonucleotide polymers -- Cancer immunotherapy and nanomedicine -- RNA nanotechnology: inspired by DNA -- From nanotechnology to nanomedicine: applications to cancer research -- Comparative structural and functional studies of nanoparticle formulations for DNA and siRNA delivery -- Advances in novel drug delivery strategies for breast cancer therapy -- DNA origami: a history and current perspective -- Nanoparticles: a promising modality in the treatment of sarcomas -- Gold nanorod delivery of an ssRNA immune activator inhibits pandemic H1N1 influenza viral replication -- Recent developments in oligonucleotide conjugation -- In vivo delivery of small interfering RNA to tumors and their vasculature by novel dendritic nanocarriers -- DNA and carbon nanotubes as medicine -- LHRH-targeted nanoparticles for cancer therapeutics -- Nanoparticle-aptamer conjugates for cancer cell targeting and detection -- Evaluation of targets for ovarian cancer gene silencing therapy: in vitro and in vivo approaches -- Prediction and design of DNA and RNA structures -- siRNA applications in nanomedicine.

Sommario/riassunto

DNA and RNA nanobiotechnologies have currently reached the status of one of the most dynamic research areas in the field of drug delivery in molecular medicine. Scientists and bio-engineers are creating totally new nanometer-scale structures with unique biological properties for a wide range of medical applications. The book, written by world-leading scientists in this new field, gives an overview of various aspects and applications of DNA and RNA nanotechnologies. These include the design and synthesis of DNA and RNA nanostructures with the aim of using them for different kinds of drug deliveries, for genetic immunization, for metabolite and nucleic acid detection, gene regulation, siRNA delivery for cancer treatment, and even analytical and

therapeutic applications of aptamer-based nanoparticles. This volume will be of interest not only to graduate students and researchers in the field of molecular medicine and molecular biology, but also to chemists interested in the biological fields. As a matter of fact, the book contains so many new and unique approaches to this area of molecular medicine that it may inspire the interested reader to undertake research into nucleic acid nanotechnologies.