PATENTS

RNA-based therapies

Recent patents in siRNA, antisense oligonucleotides, and CRISPR.

Patent number	Description	Assignee	Inventor	Date
US 10,155,946	Particles containing nucleic acids with both DNAzyme and/or RNAzyme and siRNA sequences conjugated to therapeutic nucleic acids comprising a sequence that catalytically cleaves RNA (e.g., DNAzyme or RNAzyme). The conjugated particles are used in the treatment or prevention of cancer, viral infections or bacterial infections and in detecting metal ions and other small-molecule analytes.	Emory University (Atlanta, GA, USA)	Yehl K, Khalid S	12/18/2018
US 10,155,945	A method for preparing a liposome that efficiently encapsulates a negatively charged therapeutic polymer (e.g., siRNA). The process involves preparing a lipid mixture comprising a cationic lipid in a water-miscible organic solvent such as ethanol and adding this solution to the polymer dissolved in water. The resulting nanoparticles have a mean size of 50–150 nm.	Nitto Denko Corporation (Osaka, Japan)	Knopov V, Witte RP, Karmali P, Lee R, Webb D, Akopian V	12/18/2018
US 10,144,762	A method for enhancing, by at least 10 fold, the antibacterial activity of an antisense oligonucleotide composed of morpholino subunits linked by phosphorus-containing intersubunit linkages. Also, an antisense oligonucleotide having enhanced antibacterial activity by virtue of one or both modifications.	Sarepta Therapeutics (Cambridge, MA, USA)	Weller DD, Geller BL, Iversen PL, Tilley LD, Hassinger JN	12/4/2018
US 10,144,725	Lipid compounds and formulations thereof and their use in the delivery of therapeutic agents, such as nucleic acid molecules, to cells. The compounds include a class of cationic lipids having an amine moiety, such as an amino-amine or an amino-amide moiety. The lipid compounds are useful for in vivo or in vitro delivery of one or more agents (e.g., a polyanionic payload or an antisense payload, such as an RNAi agent).	Dicerna Pharmaceuticals (Cambridge, MA, USA)	Brown BD	12/4/2018
US 10,131,910	Novel antisense oligonucleotides that may be used in the treatment, prevention and/or delay of Usher syndrome type 2 A and/or USH2A-associated nonsyndromic retina degeneration.	Catholic University Foundation (Nijmegen, Netherlands)	Van Wyk HAR	11/20/2018
US 10,131,904	Improved RNAi constructs with a double-stranded region of 19–49 nucleotides (preferably 25, 26, or 27 nucleotides) that are preferably blunt ended. The constructs also have selective minimal modifications to confer an optimal balance of biological activity, toxicity, stability, and target gene specificity.	RXi Pharmaceuticals (Marlborough, MA, USA)	Pavco PA, Kamen J, Woolf TM, Salomon W, Khvorova A	11/20/2018
US 10,119,133	A guide RNA, which includes both a complementarity region, which binds the target DNA by base pairing, and a Cas9-binding region, to direct a Cas9 nuclease to a target DNA. Also, methods for increasing specificity of RNA-guided genome editing using CRISPR–Cas9 systems by using truncated guide RNAs (tru-gRNAs).	The General Hospital Corp. (Boston)	Joung J, Sander JD, Fu Y, Maeder M	11/6/2018
US 10,059,940	Chemically ligated guide RNA oligonucleotides (lgRNA) that comprise two functional RNA modules (crgRNA and tracrgRNA) joined by non-nucleotide chemical linkers (nNt-linker), their complexes with CRISPR–Cas9, preparation methods of Cas9–lgRNA complexes, and their uses for treatments of viral infections in humans. Also, processes and methods for preparation of these compounds.	Zhong M	Zhong M	8/28/2018

Source: United States Patent and Trademark Office (http://www.uspto.gov).

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