

PATENTS

Synthetic biology

Recent patents related to synthetic genes, microRNAs and nanoparticles.

Patent number	Description	Assignee	Inventor	Date
US 10,308,947	Materials and methods to generate numerous small RNAs from one polynucleotide construct (synthetic gene) to facilitate RNA-guided multiplex genome editing, modification, inhibition of expression and other RNA-based technologies. The synthetic gene/polynucleotide construct encodes polycistronic RNA components separated by tRNAs, and preferably also includes regulatory components such as a promoter or terminator to form an expression cassette. The system can be used for any RNA-based gene manipulation method including RNA-mediated genome editing, artificial microRNA-mediated gene silencing, small RNA-mediated genetic manipulation, double-stranded RNA-mediated gene silencing, antisense mechanisms and the like.	The Penn State Research Foundation (University Park, PA, USA)	Yang Y, Xie K	6/4/2019
US 10,308,705	Synthetic liver-specific promoters and expression constructs for producing polypeptides and functional nucleic acids in the liver of a subject. Also, factor VIII proteins containing modifications in the amino acid sequence of the factor VIII protein, as well as nucleic acid constructs encoding the factor VIII proteins and methods of using these compositions to treat a bleeding disorder.	The University of North Carolina at Chapel Hill (Chapel Hill, NC, USA)	Xiao X, Li J, Yuan Z	6/4/2019
US 10,302,614	Natural or synthetic DNA pieces used to tag items, including food items, that identify the origin of the food, such as the grower, packer and other points of distribution, and their attributes. Useful for tracing the food in case of food contamination or adulteration.	SafeTraces (Oakland, CA, USA), Lawrence Livermore National Security (Livermore, CA, USA)	Zografos A, Farquar GR	5/28/2019
US 10,301,594	Compositions comprising synthetic membrane-receiver complexes, methods of generating synthetic membrane-receiver complexes, and methods of treating or preventing diseases, disorders or conditions therewith.	Rubius Therapeutics (Cambridge, MA, USA)	Kahvejian A, Mata-Fink J, Round J, Berry DA, Afeyan NB	5/28/2019
US 10,301,345	Phosphoramidate esters and related nucleotide analogs useful in polynucleotide sequencing techniques, and synthetic methods for preparing those compounds. These compounds include nucleotide phosphoramidate analogs that are modified on the α -phosphate to enable attachment of a variety of application-specific substituents such as tether molecules.	Stratos Genomics (Seattle, WA, USA)	Kokoris MS, Tabone J, Nabavi M, Jacobs A	5/28/2019
US 10,300,145	A synthetic nanoparticle comprising a peptide nucleic acid (PNA) oligomer conjugated to a lipid, wherein the PNA oligomer noncovalently complexes with an immunomodulatory compound, thereby forming a nanoparticle. Useful to elicit immune responses and can be used to treat a broad range of cancers and infectious diseases.	Massachusetts Institute of Technology (Cambridge, MA, USA)	Irvine DJ, Dane E	5/28/2019
US 10,294,285	New synthetic preparations containing isoforms of chemically modified recombinant human CC10 protein generated by processes that utilize reactive oxygen species and reactive nitrogen species. Preparations containing novel isoforms may be used as standards to identify and characterize naturally occurring isoforms of native CC10 protein from blood or urine and ultimately to measure new CC10-based biomarkers to assess patient disease status. May also be used to treat respiratory, autoimmune, inflammatory and other medical conditions that are not effectively treated with the unmodified protein.	Therabron Therapeutics (Rockville, MD, USA)	Pilon-Clayton AL, Hariprakash HK, Clayton RS, Winn ME	5/21/2019
US 10,287,588	Specially designed synthetic BCL11A-targeting microRNAs for RNA polymerase II expression, and methods of use to treat hemoglobinopathies such as sickle cell disease or thalassemia by increasing the expression of fetal hemoglobin. Also, improved gene therapy methods for treating hematopoietic-related disorders.	Children's Medical Center Corp. (Boston)	Milsom M, Williams DA, Gregory R	5/14/2019

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