Nanoparticles for Drug Delivery, Tissue Targeting and Imaging Analysis

Tech ID: 24124 / UC Case 2010-279-0

ABSTRACT

Nanoparticles made of lipoproteins, lipids, and telodendrimers for *in vivo* drug delivery, tissue/cancer targeting, and imaging analysis.

FULL DESCRIPTION

Nanolipoprotein particles (NLPs) are nanoscale patches of lipid bilayer stabilized by peripheral scaffold. NLPs have distinct advantages over currently used membrane systems in terms of particle size and consistency. Currently, the greatest use of NLPs has been the stabilization and characterization of membrane proteins.

Researchers at the University of California, Davis have developed a novel nanoparticle. When used to synthesize NLPs, these nanoparticles allow for NLPs to be used in in vivo drug delivery, tissue/cancer targeting, and imaging analysis. Additionally this technology also provides important information about the structure and function of membrane-bound proteins in water soluble particles that mimic the hydrophobic cell membrane. The combination of lipoprotein, lipids, and telodendrimers creates highly homogenous nanoparticles throughout the NLP, which has not been achieved by other means.

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APPLICATIONS

- Supporting membrane proteins, small molecules, hydrophobic drugs and other moieties for targeting specific tissues and tumors for drug treatment and drug development
- Rapid design and production of *in vivo* targeting, imaging and therapeutic delivery of biologically active molecules though direct surface conjugation to the telodendrimers
- Effective drug delivery system that can further increase drug efficacy

FEATURES/BENEFITS

- Nanoparticle synthesis does not require pre-purification of reagents or detergent solubilization of components
- Allows for the production of membrane proteins that can be captured as isolated as soluble entities
- Utilizes entirely cell-free processes and technologies
- Telo-NLP nanoparticles can execute site specific attachment/immobilization though telodendrimer-based chemistry, which means that no antibodies or fusion protein tags are required to immobilize the nanoparticles on any desired surface
- Telo-NLP nanoparticles use non-antigenic material
- The final size and monodispersity of the nanoparticles can be selected for by varying the ratio of telodendrimer-to-lipid concentrations, or varying the telodendrimers themselves
- Multiple types of telodendrimers can be used in synthesis to allow for multifaceted functions, including tumor targeting or drug delivery
- Novel size and stable compound

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,053,322	07/06/2021	2010-279

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OTHER INFORMATION

CATEGORIZED AS

- **Biotechnology**
  - Health
- **Medical**
  - Delivery Systems
  - Therapeutics

RELATED CASES

2010-279-0

Additional Patents Pending

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Novel Solid Tumor Chemodrug LLS2
- Affinity Peptides for Diagnosis and Treatment of Severe Acute Respiratory Syndrome Coronavirus 2 and Zika Virus Infections
- Conjugates That Combine HDAC Inhibitors and Retinoids into Disease Preventatives/Treatments
- A Novel RGD-Containing Cyclic Peptide for use in Cancer Imaging and as a Targeted-Therapy Ligand
- Site-Specific Ligation and Compound Conjugation to Existing Antibodies
- Functional Illumination in Living Cells
- Multifunctional Porphyrin-Based Nanomedicine Platform
- A Two-step Drug Delivery System Based on Click Chemistry
- Transformable Smart Peptides as Cancer Therapeutics
- Engineered Biomaterial to Prevent Endothelial Inflammation
- Programmable Peptide Nucleic Acid-Based Nanoplatform for Customizable Drug Delivery
- Systems and Methods of Single-Cell Segmentation and Spatial Multiomics Analyses
- Proteoglycan Mimetics For Enhanced Wound Healing Angiogenesis And Vascular Repair
- Nanoplatform for Cancer Therapy
- Ligands for Improved Angiogenesis and Endothelialization of Blood Contacting Devices

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