Transformable Smart Peptides as Cancer Therapeutics

Tech ID: 32677 / UC Case 2019-799-0

ABSTRACT

Researchers at the University of California, Davis have developed smart, supramolecular, materials that can assemble into nanoparticles. These particles can then be used to target tumor cells.

FULL DESCRIPTION

Immunotherapy orchestrates the body's own immune system to target and eradicate cancer cells - which may result in durable, anti-tumor, responses and reduce metastasis and recurrence. As such, immunotherapy is a promising cancer management strategy. Currently, peptides-based materials are an excellent candidate for cancer immunotherapy, based on their easy modification, effectiveness and ability to penetrate tissues while triggering minimal immune responses. However, peptides have specific properties that can limit scientific and commercial interest in using peptides as a cancer therapy (compared to small molecule therapies). Thus, there is a need to improve peptide-based immunotherapy delivery systems before they will reach widespread clinical acceptance.

Researchers at the University of California, Davis have developed smart, peptide-based, supramolecular materials that can assemble into nanoparticles, followed by their in-situ transformation into nanofibrillar structures. These structures can then effectively spread and securely bind to tumor cells. This technology is comprised of three motifs: a hydrophobic fluorescence tracer signal or drug unit, a functional peptide; and a targeting ligand to bind to tumor-associated integrins. The fibrillary network formation allows prolonged retention time in the tumor and better binding efficiency – thus increasing therapeutic efficacy.

APPLICATIONS

- Immunotherapy for cancer

FEATURES/BENEFITS

- Customizable by changing two of the three chemical motifs
- Prolonged retention at tumor site

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	20220387633	12/08/2022	2019-799

RELATED MATERIALS

- Zhang, L., Jing, D., Jiang, N. et al. Transformable peptide nanoparticles arrest HER2 signalling and cause cancer cell death in vivo. Nat. Nanotechnol. 15, 145–153 (2020). -

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OTHER INFORMATION

KEYWORDS

nanoparticles, peptide, immunotherapy, cancer, ligand, tumor cells

CATEGORIZED AS

- Medical
- Delivery Systems
- Disease: Cancer
- Therapeutics
- **Nanotechnology**
- NanoBio

RELATED CASES

2019-799-0

07/01/2022

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Novel Solid Tumor Chemodrug LLS2
- Nuclear Magnetic Resonance System for Determining Oil and Water Compositions in Drilling Mud
- Affinity Peptides for Diagnosis and Treatment of Severe Acute Respiratory Syndrome Coronavirus 2 and Zika Virus Infections
- Nanoparticles for Drug Delivery, Tissue Targeting and Imaging Analysis
- Conjugates That Combine HDAC Inhibitors and Retinoids into Disease Preventatives/Treatments
- Artificial Intelligence-Based Evaluation Of Drug Efficacy
- 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
- Ligands for Alpha-4-Beta-1 Integrin
- Functional Illumination in Living Cells
- Multifunctional Porphyrin-Based Nanomedicine Platform
- A Two-step Drug Delivery System Based on Click Chemistry
- 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
- Nanoplatform for Cancer Therapy

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