A Stable BPTI Peptide as Cancer Therapeutic and for Cardiac Surgery to Reduce Blood Loss

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ABSTRACT

Researchers at the University of California, Davis have developed a unique non-sacrificial synthetic peptide substrate designed to inhibit plasmin activity and prevent tumor progression and ascites formation in cancers characterized by elevated plasmin levels.

FULL DESCRIPTION

This technology relates to a synthetic peptide engineered from bovine pancreatic trypsin inhibitor (BPTI). Since all peptide-based plasmin inhibitors are sacrificial substrates for plasmin cleavage , this invention is designed to resist proteolytic degradation by plasmin. This highly stable peptide is resistant to plasmin even after 48 hours of incubation and significantly efficacious over BPTI against ascites development in xenograft models. The peptide may be fused to targeting moieties such as antibodies specific to tumor-associated antigens (e.g., folate receptor alpha or Fas receptor). It is designed to treat tumors characterized by elevated plasmin levels, including ovarian, breast, and pancreatic cancers, and to prevent malignant ascites formation. Additionally, it may be used to reduce bleeding during heart surgeries like coronary artery bypass.

APPLICATIONS

- Therapeutic treatment of solid tumors with elevated plasmin levels, including ovarian, breast, and pancreatic cancers.
- Prevention and management of malignant ascites in cancer patients.
- Adjunct therapy combined with CAR-T cell immunotherapies.
- Use as a hemostatic agent during cardiac surgeries such as coronary artery bypass grafting.

FEATURES/BENEFITS

- Resists plasmin-mediated proteolytic degradation, improving therapeutic stability and durability.
- Enables targeted delivery to tumors by fusing to antibodies against tumor-associated antigens.
- Reduces malignant ascites formation, lowering complications and potentially improving survival.
- Strengthens cancer therapy when used adjunctively (e.g., alongside CAR-T approaches).
- Reduces bleeding risk in major cardiac surgery (e.g., coronary artery bypass), improving surgical outcomes.
- Blocks elevated plasmin activity that drives tumor invasion and metastasis.

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OTHER INFORMATION

KEYWORDS

antibody, ascites, cancer, chemotherapy, immunotherapy, peptide, plasmin, solid tumor, synthetic peptide, tumor-associated antigen

CATEGORIZED AS

- **Biotechnology**
  - Health
- **Medical**
  - Disease: Cancer
  - Therapeutics

RELATED CASES

2026-363-0

- Prevents or reduces malignant ascites that worsens outcomes in cancer patients.
- Counters tumor-microenvironment–associated chemoresistance (notably in ovarian cancer).
- Mitigates perioperative bleeding complications in complex heart surgeries.

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Engineered Hcmv Protein-Derived Variants As Dr5 Agonist Immunotherapeutics For Solid And Pediatric Tumors
- Novel Tumor-Specific Fas Epitope Targeting Antibodies

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