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# Development of a novel cytokine-like Propeptide gene therapy platform

**ProPep gene therapy co-delivers pro-osteogenic and anti-tumor signals to halt prostate cancer metastases while promoting bone regrowth.**

Researchers at Purdue University have developed a novel, cytokine-like gene therapy called Propeptide (ProPep) that treats prostate cancer and promotes bone regrowth. Current prostate cancer bone metastases treatments are notoriously hindered by tumor growth reduction or elimination while attempting to restore bone homeostasis. Despite well-grounded evidence that propeptides are reliable for prostate cancer therapeutics, their proof-of-concept is still nascent and limited for preclinical translation.

Purdue University researchers have instead proven propeptides' viability as a successful prostate cancer therapeutic via ProPep. This novel gene therapy supplies clinicians and oncologists with a multifunctional biologic possessing pro-osteogenic and anti-tumorigenic modules. These properties allow the therapeutic to be released precisely at the site of metastases and bind individually to target receptors, ultimately promoting a rebalancing of bone remodeling. Highly modular and versatile, this therapeutic can be deployed in myriads of complex microenvironments. ProPep will serve as an indispensable tool for augmenting prostate cancer survival rates and improving the overall quality of life for patients

**Technology Validation:**

A functional assay was conducted to estimate the anti-tumorigenic and pro-apoptotic potential of the targeted Propeptide therapeutic through STAT signaling shifts. Treatment with Propeptide significantly upregulated STAT-1 expression in C4-2B cells transfected with a STAT-1 luciferase reporter (pGAS/ISRE-Luc).

Gene and protein expression analysis demonstrated that the selected Propeptide model resulted in a structurally stable molecule detectable by RT-qPCR, western blot, and FACS analysis.

**Technology ID**

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**Category**

Biotechnology & Life Sciences/Cell & Gene Therapy Platforms
Pharmaceuticals/Drug Discovery & Development
Digital Health & Medtech/Implantable Medical Devices

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**Advantages**:

-Promotes bone regrowth while simultaneously inhibiting tumor development

-Applicable to different types of tumors and different conditions, such as arthritis

-Specifically targets sites of metastases

**Applications**:

-Anti-inflammatory therapeutics

-Anti-tumorigenic therapeutics

-Pro-osteogenic therapeutics

-Prostate cancer

-Bone therapy

-Arthritis

**TRL:** 3

**Intellectual Property:**

Provisional-Patent, 2023-05-15, United States

PCT-Patent, 2024-05-15, WO

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