

# ProPep: A Novel Cytokine-Like Gene Therapy for Prostate Cancer and Bone Remodeling

**Novel Propeptide (ProPep) gene therapy is a multifunctional biologic with pro-osteogenic and anti-tumorigenic modules that specifically targets cancer metastases to promote bone regrowth and inhibit tumor development.**

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**  
2023-FIGU-70017

## Category

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

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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  
| NATL-Patent, N/A, United States | NATL-Patent, N/A, Europe