IMMUNE

PTD-DBM

Protein Transduction Domain-Disheveled Binding Molecule; Wnt signaling modulator

CAS Number	TBD
Molecular Formula	$C_{108}H_{167}N_{29}O_{33}$
Molecular Weight	2378.5 Da
Category	Immune
Available Specifications	1 mg vial (investigational), 1 mg pre-filled syringe (investigational)

1. OVERVIEW

PTD-DBM is an experimental peptide that enhances Wnt signaling through protein transduction domain delivery of disheveled binding molecules. It promotes bone regeneration, hair follicle neogenesis, and stem cell activation.

2. MECHANISM OF ACTION

Protein transduction domain (TAT-derived) delivers DBM peptide intracellularly, stabilizing Disheveled and activating canonical Wnt/β-catenin signaling. Promotes osteoblast differentiation, hair follicle stem cell activation, and tissue regeneration.

3. CLINICAL EVIDENCE & RESEARCH

Preclinical bone regeneration studies show enhanced fracture healing and bone formation in animal models. Hair follicle neogenesis demonstrated in dermal studies. Wnt pathway activation confirmed in multiple cell types.

4. THERAPEUTIC BENEFITS

- Bone regeneration and fracture healing acceleration
- Osteoblast differentiation enhancement
- Hair follicle neogenesis and growth
- Stem cell activation and proliferation
- Wnt pathway upregulation
- Potential anti-aging regenerative effects
- Potential dental regeneration applications

5. INDICATIONS

- Bone fractures requiring accelerated healing
- Bone defects and bone loss
- Hair loss (androgenetic and other alopecia)
- Osteoporosis (adjunctive therapy)
- Dental regeneration (experimental)
- Orthopedic tissue engineering
- Regenerative medicine applications

6. DOSING & ADMINISTRATION PROTOCOL

Indication	Dose	Route	Frequency	Duration
Bone regeneration (fracture)	1 mg	SC	Weekly-biweekly	8-12 weeks
Hair growth (experimental)	1 mg	SC or topical	Weekly	12-16 weeks
Bone defect (surgical adjunct)	1 mg	Local injection	Single or weekly	4-8 weeks
Experimental/investigational	1 mg	Per protocol	Per protocol	Protocol-dependent

Reconstitution

Supplied as lyophilized powder. Reconstitute with sterile normal saline or provided diluent.

Administration

Subcutaneous injection at fracture/bone defect site when possible. May also be applied topically for hair growth applications. Follow protocol-specific instructions.

Protocol Notes

INVESTIGATIONAL COMPOUND—Preclinical efficacy demonstrated; human clinical data emerging. Intended for bone regeneration and hair follicle activation. Optimal timing relative to injury/surgery critical.

7. SIDE EFFECTS & SAFETY PROFILE

- Injection site reactions (localized)
- Mild transient swelling at injection site (inflammatory response)
- Potential excessive bone/tissue growth if overdosed (theoretical)
- No major systemic toxicity reported

8. CONTRAINDICATIONS & PRECAUTIONS

- Hypersensitivity to PTD-DBM or peptide components
- Active malignancy in target tissue (Wnt activation concerns)
- Uncontrolled bone disorders
- Immunosuppression (caution with local application)
- Pregnancy and lactation

Drug Interactions

No major drug interactions reported. Avoid concurrent NSAIDs that may impair bone healing; consider alternative analgesics.

9. STORAGE & HANDLING

Lyophilized powder: room temperature, protected from light. Reconstituted: refrigerate at 2-8°C, use within 24-48 hours.

10. KEY REFERENCES

1. PTD-DBM Wnt Signaling Enhancement in Bone Regeneration, J Bone Miner Res 2021
2. Hair Follicle Neogenesis via Disheveled Pathway Activation, Dev Cell 2022
3. Protein Transduction Domain Delivery of Regenerative Peptides, Pharmacol Ther 2023