

SPECIALTY

Dermorphin

Dermorphine, Cerulein, frog peptide opioid

CAS Number	61107-01-9
Molecular Formula	$C_{49}H_{62}N_8O_{11}$
Molecular Weight	974.08 g/mol
Sequence / Structure	Tyr-D-Ala-Phe-Gly-Tyr-Pro-Ser-NH ₂
Category	Specialty
Available Specifications	Research grade 2mg, Research grade 10mg, DEA-controlled substance only

1. OVERVIEW

Dermorphin is a naturally occurring peptide derived from the skin of poison frogs (*Phyllomedusa* species) that acts as a selective μ -opioid receptor agonist with potency approximately 40 times greater than morphine. Research peptide with significant analgesic potential but substantial regulatory and safety concerns limiting clinical availability.

2. MECHANISM OF ACTION

Dermorphin operates through opioid receptor activation: (1) high-affinity binding to μ -opioid receptors; (2) G-protein coupled receptor activation leading to decreased cAMP; (3) activation of inwardly rectifying K⁺ channels and inhibition of Ca²⁺ channels; (4) potent CNS and spinal analgesic effects; (5) 40-fold greater potency than morphine; (6) potential for addiction and tolerance similar to opioids.

3. CLINICAL EVIDENCE & RESEARCH

Research demonstrates potent analgesic effects in animal models. Limited human clinical data due to regulatory status. Studies show rapid onset and sustained analgesia. Abuse liability comparable to other opioids. Research focused on structure-activity relationships to develop safer analogs.

4. THERAPEUTIC BENEFITS

- Potent analgesia (40x morphine potency)
- Rapid onset of action
- Potential for intractable pain management
- Research into opioid mechanism
- Development of safer analogs
- Novel mechanism of action vs traditional opioids
- Potential for non-systemically administered forms
- Pure research applications

5. INDICATIONS

- Research into opioid pharmacology
- Structure-activity relationship studies
- Development of non-addictive opioid analogs
- Severe intractable pain (research only)
- Potential for novel pain management approaches

- Fundamental research in neuropeptide biology
- Academic and pharmaceutical research settings
- Not approved for clinical use

6. DOSING & ADMINISTRATION PROTOCOL

Indication	Dose	Route	Frequency	Duration
Research use only	0.001-0.1 mg/kg	IV/SC (animal studies)	Single dose	Acute study
Analgesic research	Variable (µg range)	IV infusion	Per protocol	Research
Mechanism studies	Dose-response	IV/intrathecal	Per protocol	Research only
Not approved clinically	N/A	N/A	N/A	Research only

Reconstitution

Dermorphin supplied as lyophilized powder for research institutions only. Reconstitute with sterile saline or appropriate research vehicle per protocol. Requires appropriate institutional oversight and DEA registration for controlled substance.

Administration

IV infusion, IV bolus, subcutaneous, intrathecal, or other routes per research protocol. Not intended for clinical use. Requires specialized medical and research supervision.

Protocol Notes

Strictly regulated research compound. Requires DEA registration and institutional approval. Potential for abuse necessitates strict inventory and use controls. Research focused on safer analogs without addiction potential. Not available for clinical use outside research settings.

7. SIDE EFFECTS & SAFETY PROFILE

- Respiratory depression (major concern)
- Sedation and CNS depression
- Potential for addiction and dependence
- Nausea and vomiting
- Pruritus (opioid-typical)
- Constipation
- Potential for overdose
- Withdrawal symptoms with discontinuation

8. CONTRAINDICATIONS & PRECAUTIONS

- Clinical use (not approved)
- Respiratory compromise
- Severe hepatic or renal disease
- Concurrent opioid therapy
- History of substance use disorder
- Pregnancy and lactation
- Hypersensitivity to peptides
- Most human applications

Drug Interactions

Expected additive effects with CNS depressants, opioids, alcohol. Potential interaction with serotonergic drugs (serotonin syndrome risk). Pharmacokinetic interactions likely similar to morphine.

9. STORAGE & HANDLING

Store lyophilized powder at -20°C in secure, controlled-access location. Requires DEA-compliant storage with security measures. Solutions prepared for immediate use. Inventory and use records required.

10. KEY REFERENCES

1. Montecucchi, P.C., et al. (1981). "Amino acid composition and sequence of dermorphin, a novel opioid-like peptide from frog skin." *International Journal of Peptide and Protein Research*, 17(3), 275-283.
2. Simmaco, M., et al. (1991). "Antimicrobial peptides from amphibian skin: isolation and characterization." *Biological Chemistry Hoppe-Seyler*, 372(12), 1037-1042.

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