

RESEARCH MONOGRAPH . COMPOUND PROFILE

PT-141 (Bremelanotide)

A FDA-approved (2019) melanocortin receptor agonist (Vyleesi) for hypoactive sexual desire disorder in premenopausal women, derived from melanotan II.

DOCUMENT	KDC-MN-091
ISSUED	2026-05-09
REVISION	1.0
AUTHOR	Kodiac bioLabs Research
COMPOUND CLASS	Melanocortin-4 receptor agonist

RESEARCH USE ONLY

ABSTRACT

Bremelanotide (Vyleesi; PT-141; CAS 189691-06-3; molecular formula C₅₀H₆₈N₁₄O₁₀; molecular weight 1025.18) is a cyclic heptapeptide melanocortin receptor agonist approved by the FDA in 2019 for hypoactive sexual desire disorder (HSDD) in premenopausal women. The compound is derived from the alpha-MSH analog melanotan II by structural modification that increased selectivity toward MC₄ versus MC₁ (reducing the skin pigmentation activity prominent in melanotan II). PT-141 was originally developed as a sunless tanning agent before pivoting to sexual function applications when central effects were observed. Mechanism is melanocortin-4 receptor agonism in the central nervous system, with downstream effects on dopaminergic and oxytocinergic pathways implicated in sexual response. The compound is administered subcutaneously prior to anticipated sexual activity. Approved dose is 1.75 mg subcutaneous prior to use. Pharmacokinetics: plasma half-life approximately 2.7 hours; the central effect persists 4 to 6 hours after administration. Adverse events include nausea (highest frequency), hyperpigmentation with chronic use, and modest blood pressure elevation.

1. Compound Identification

PT-141 (Bremelanotide) is described as melanocortin-4 receptor agonist. A FDA-approved (2019) melanocortin receptor agonist (Vyleesi) for hypoactive sexual desire disorder in premenopausal women, derived from melanotan II.

1.1 Class summary

Melanocortin-4 receptor agonist

1.2 Subtitle

A FDA-approved (2019) melanocortin receptor agonist (Vyleesi) for hypoactive sexual desire disorder in premenopausal women, derived from melanotan II.

2. Abstract

Bremelanotide (Vyleesi; PT-141; CAS 189691-06-3; molecular formula C₅₀H₆₈N₁₄O₁₀; molecular weight 1025.18) is a cyclic heptapeptide melanocortin receptor agonist approved by the FDA in 2019 for hypoactive sexual desire disorder (HSDD) in premenopausal women. The compound is derived from the alpha-MSH analog melanotan II by structural modification that increased selectivity toward MC4 versus MC1 (reducing the skin pigmentation activity prominent in melanotan II). PT-141 was originally developed as a sunless tanning agent before pivoting to sexual function applications when central effects were observed. Mechanism is melanocortin-4 receptor agonism in the central nervous system, with downstream effects on dopaminergic and oxytocinergic pathways implicated in sexual response. The compound is administered subcutaneously prior to anticipated sexual activity. Approved dose is 1.75 mg subcutaneous prior to use. Pharmacokinetics: plasma half-life approximately 2.7 hours; the central effect persists 4 to 6 hours after administration. Adverse events include nausea (highest frequency), hyperpigmentation with chronic use, and modest blood pressure elevation.

3. Mechanism of Action

Selective MC4 melanocortin receptor agonist; downstream dopaminergic and oxytocinergic effects.

The mechanistic profile described above represents the consensus position from peer-reviewed literature where available; for compounds with sparse formal characterization, this section reflects vendor-grade reports and structurally-related class pharmacology and should be interpreted with appropriate caution.

4. Pharmacokinetics and Routes of Administration

Pharmacokinetic data are summarized within the abstract for compounds with formal Phase 1 records. Compounds without published human pharmacokinetic studies are noted as such; investigators should treat the absence of data as a research limitation.

5. Reported Research Dose Ranges

1.75 mg SC prior to sexual activity; not for chronic daily use.

Doses are scaled from clinical use where the compound is approved as a medicine, from Phase 2/3 trials where development advanced, or from rodent dose-response data scaled by allometric assumptions where the compound has no human clinical record. Investigators should treat dose ranges from research-chemical-grade vendors as starting points for their own pharmacokinetic and tolerability characterization rather than validated dosing recommendations.

6. Sourcing and Quality Verification

Investigators should obtain analytical confirmation of identity (mass spectrometry; for peptides, additionally amino acid analysis or N-terminal sequencing) and purity (HPLC area-percent, ideally greater than 95 percent) on every lot. Vendor certificates of analysis vary in quality; third-party analytical confirmation through independent laboratories (e.g., Janoshik Analytical, Anabolic Lab) is the gold standard for research-grade peptides and small molecules.

For compounds with established pharmaceutical-grade marketing in any jurisdiction, sourcing from the marketed product (where legal and accessible) provides the highest quality assurance.

7. Reconstitution and Handling

Peptides should be reconstituted in bacteriostatic water or sterile water for injection in the volume appropriate to the desired concentration; lyophilized peptides should be allowed to come to room temperature before reconstitution to minimize precipitation. Reconstituted peptides should be stored refrigerated and used within the timeframe specified by the manufacturer (typically 14 to 30 days for bacteriostatic water reconstitutions, shorter for sterile water).

Small molecules: storage conditions vary by compound; consult the certificate of analysis for the specific product. Most are stable at room temperature in dry, dark conditions; oxidation-sensitive compounds (e.g., catecholamine precursors) require cool storage and protection from light.

8. Stack Interaction Considerations

Investigators combining this compound with other research substances should consider receptor-level interactions (additive effects at shared targets), enzyme-level interactions (CYP-mediated drug-drug interactions where applicable), and pharmacodynamic interactions (additive sedation, additive serotonergic activity, additive hemodynamic effects).

The stack interaction section in published monographs of well-characterized compounds is necessarily incomplete for any specific combination; investigators should treat novel combinations with elevated caution and titrate gradually.

9. References

1. Kingsberg SA, et al. Bremelanotide for the treatment of hypoactive sexual desire disorder. Obstet Gynecol 2019.

This monograph is provided for research use only. Not for medical, diagnostic, or therapeutic purposes. Not for human consumption. Compound class generalizations are noted where compound-specific data are sparse; investigators should weight the evidence accordingly.