

RESEARCH MONOGRAPH . COMPOUND PROFILE

Higenamine

A benzyloisoquinoline alkaloid found in lotus and aconite; a beta-2 adrenergic agonist used in pre-workout supplements.

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AUTHOR	Kodiac bioLabs Research
COMPOUND CLASS	Beta-2 adrenergic agonist (botanical)

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ABSTRACT

Higenamine ((R/S)-1-(4-hydroxybenzyl)-1,2,3,4-tetrahydroisoquinoline-6,7-diol; CAS 5843-65-2; molecular formula C₁₆H₁₇NO₃; molecular weight 271.31) is a benzylisoquinoline alkaloid found in *Aconitum*, *Tinospora cordifolia*, *Nelumbo nucifera* (lotus), and other plants. The compound is a beta-2-preferring adrenergic agonist with secondary beta-1 and limited beta-3 activity; the agonist profile is qualitatively similar to clenbuterol with substantially lower potency. Used in traditional Chinese medicine for cardiac and respiratory indications. Marketed as a pre-workout supplement ingredient for vasodilation and mild stimulant effects. WADA-banned in competition. Plasma half-life is approximately 0.1 to 0.3 hours, very short. Used as a botanical beta-adrenergic agonist in research.

1. Compound Identification

Higenamine is described as beta-2 adrenergic agonist (botanical). A benzyloisoquinoline alkaloid found in lotus and aconite; a beta-2 adrenergic agonist used in pre-workout supplements.

1.1 Class summary

Beta-2 adrenergic agonist (botanical)

1.2 Subtitle

A benzyloisoquinoline alkaloid found in lotus and aconite; a beta-2 adrenergic agonist used in pre-workout supplements.

2. Abstract

Higenamine ((R/S)-1-(4-hydroxybenzyl)-1,2,3,4-tetrahydroisoquinoline-6,7-diol; CAS 5843-65-2; molecular formula C₁₆H₁₇NO₃; molecular weight 271.31) is a benzylisoquinoline alkaloid found in *Aconitum*, *Tinospora cordifolia*, *Nelumbo nucifera* (lotus), and other plants. The compound is a beta-2-preferring adrenergic agonist with secondary beta-1 and limited beta-3 activity; the agonist profile is qualitatively similar to clenbuterol with substantially lower potency. Used in traditional Chinese medicine for cardiac and respiratory indications. Marketed as a pre-workout supplement ingredient for vasodilation and mild stimulant effects. WADA-banned in competition. Plasma half-life is approximately 0.1 to 0.3 hours, very short. Used as a botanical beta-adrenergic agonist in research.

3. Mechanism of Action

Beta-2-preferring adrenergic agonist with secondary beta-1 activity; mechanism comparable to clenbuterol with lower potency.

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

Supplement 50 to 100 mg per oral administration daily.

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. Lo CF, Chen CM. Pharmacokinetic studies of higenamine in rabbit plasma. Drug Metab Dispos 1996.
2. Tsukiyama M, et al. Beta-2-adrenoceptor-mediated tracheal relaxation induced by higenamine. Biol Pharm Bull 2009.
3. Cohen PA, et al. Pharmaceutical quantities of higenamine in Coleus extracts. Forensic Sci Int 2019.

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