

RESEARCH MONOGRAPH . COMPOUND PROFILE

5-HTP (5-Hydroxytryptophan)

5-Hydroxytryptophan, the immediate precursor of serotonin, derived from Griffonia simplicifolia seeds and used for mood and sleep applications.

DOCUMENT	KDC-MN-184
ISSUED	2026-05-09
REVISION	1.0
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COMPOUND CLASS	Serotonin precursor

ABSTRACT

5-HTP (5-hydroxytryptophan; CAS 4350-09-8; molecular formula $C_{11}H_{12}N_2O_3$; molecular weight 220.23) is the immediate precursor of serotonin in the biosynthesis pathway from tryptophan. The compound is extracted from *Griffonia simplicifolia* seeds and sold as a dietary supplement. Unlike tryptophan, 5-HTP does not compete with other large neutral amino acids for transport into the CNS, providing more reliable elevation of central serotonin. The compound has been studied for depression, anxiety, sleep, and headache prevention. Use without a peripheral aromatic L-amino acid decarboxylase inhibitor produces peripheral serotonin elevation that may cause GI adverse events. Doses are typically 50 to 300 mg per day. Should not be combined with SSRIs or MAOIs due to serotonin syndrome risk.

1. Compound Identification

5-HTP (5-Hydroxytryptophan) is described as serotonin precursor. 5-Hydroxytryptophan, the immediate precursor of serotonin, derived from *Griffonia simplicifolia* seeds and used for mood and sleep applications.

1.1 Class summary

Serotonin precursor

1.2 Subtitle

5-Hydroxytryptophan, the immediate precursor of serotonin, derived from *Griffonia simplicifolia* seeds and used for mood and sleep applications.

2. Abstract

5-HTP (5-hydroxytryptophan; CAS 4350-09-8; molecular formula C₁₁H₁₂N₂O₃; molecular weight 220.23) is the immediate precursor of serotonin in the biosynthesis pathway from tryptophan. The compound is extracted from *Griffonia simplicifolia* seeds and sold as a dietary supplement. Unlike tryptophan, 5-HTP does not compete with other large neutral amino acids for transport into the CNS, providing more reliable elevation of central serotonin. The compound has been studied for depression, anxiety, sleep, and headache prevention. Use without a peripheral aromatic L-amino acid decarboxylase inhibitor produces peripheral serotonin elevation that may cause GI adverse events. Doses are typically 50 to 300 mg per day. Should not be combined with SSRIs or MAOIs due to serotonin syndrome risk.

3. Mechanism of Action

Direct serotonin precursor; converted to serotonin by aromatic L-amino acid decarboxylase. Bypasses tryptophan hydroxylase rate limit.

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

50 to 300 mg per day.

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. Birdsall TC. 5-Hydroxytryptophan: a clinically-effective serotonin precursor. Altern Med Rev 1998.

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