

RESEARCH MONOGRAPH . COMPOUND PROFILE

DHEA (Dehydroepiandrosterone)

*An endogenous adrenal steroid hormone
with androgenic and neurosteroid activity;
declines with age and supplemented for
hormone restoration.*

DOCUMENT	KDC-MN-160
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AUTHOR	Kodiac bioLabs Research
COMPOUND CLASS	Endogenous androgen precursor

ABSTRACT

DHEA (dehydroepiandrosterone; CAS 53-43-0; molecular formula $C_{19}H_{28}O_2$; molecular weight 288.42) is an endogenous adrenal steroid hormone produced by the adrenal cortex. DHEA and its sulfate (DHEAS) are the most abundant circulating steroid hormones in young adults; both decline progressively with age, reaching 10 to 20 percent of peak by age 70. The compound is a precursor for downstream androgen and estrogen synthesis and is also a sigma-1 receptor ligand and NMDA receptor PAM with neurosteroid activity. Supplementation has been studied for adrenal insufficiency, depression in older adults, sexual dysfunction, and cognitive function with mixed results. The compound is sold as a dietary supplement in the United States but is prescription-only or banned in many other jurisdictions. Doses are typically 25 to 100 mg per day; female subjects often require lower doses to avoid virilizing effects.

1. Compound Identification

DHEA (Dehydroepiandrosterone) is described as endogenous androgen precursor. An endogenous adrenal steroid hormone with androgenic and neurosteroid activity; declines with age and supplemented for hormone restoration.

1.1 Class summary

Endogenous androgen precursor

1.2 Subtitle

An endogenous adrenal steroid hormone with androgenic and neurosteroid activity; declines with age and supplemented for hormone restoration.

2. Abstract

DHEA (dehydroepiandrosterone; CAS 53-43-0; molecular formula $C_{19}H_{28}O_2$; molecular weight 288.42) is an endogenous adrenal steroid hormone produced by the adrenal cortex. DHEA and its sulfate (DHEAS) are the most abundant circulating steroid hormones in young adults; both decline progressively with age, reaching 10 to 20 percent of peak by age 70. The compound is a precursor for downstream androgen and estrogen synthesis and is also a sigma-1 receptor ligand and NMDA receptor PAM with neurosteroid activity. Supplementation has been studied for adrenal insufficiency, depression in older adults, sexual dysfunction, and cognitive function with mixed results. The compound is sold as a dietary supplement in the United States but is prescription-only or banned in many other jurisdictions. Doses are typically 25 to 100 mg per day; female subjects often require lower doses to avoid virilizing effects.

3. Mechanism of Action

Androgen/estrogen precursor; sigma-1 receptor ligand; NMDA PAM.

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

25 to 100 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. Wolkowitz OM, et al. Double-blind treatment of major depression with dehydroepiandrosterone. Am J Psychiatry 1999.

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