

RESEARCH MONOGRAPH . COMPOUND PROFILE

Andarine (S-4)

An early-generation aryl propionamide SARM; the structural lineage compound from which ostarine was derived.

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COMPOUND CLASS	Selective androgen receptor modulator (early-generation)

ABSTRACT

Andarine (S-4, GTx-007; CAS 401900-40-1; molecular formula C₁₉H₁₈F₃N₃O₆; molecular weight 441.36) is a non-steroidal aryl propionamide SARM developed by Dalton and colleagues at the University of Tennessee, the structural precursor to ostarine. The compound exhibits tissue-selective AR agonism and demonstrated efficacy in osteoporosis and BPH preclinical models. Notable for a dose-dependent visual side effect: yellow-green tint to vision at doses above approximately 50 mg, attributed to non-AR-mediated effects on retinal photoreceptors and pigments. The visual effect is reversible on discontinuation but proved clinically unacceptable for long-term development; GTx redirected development to ostarine for superior tolerability. Andarine retains research utility as the prototype aryl propionamide SARM and is widely used recreationally despite no regulatory approval. Plasma half-life is approximately 4 hours.

1. Compound Identification

Andarine (S-4) is described as selective androgen receptor modulator (early-generation). An early-generation aryl propionamide SARM; the structural lineage compound from which ostarine was derived.

1.1 Class summary

Selective androgen receptor modulator (early-generation)

1.2 Subtitle

An early-generation aryl propionamide SARM; the structural lineage compound from which ostarine was derived.

2. Abstract

Andarine (S-4, GTx-007; CAS 401900-40-1; molecular formula C₁₉H₁₈F₃N₃O₆; molecular weight 441.36) is a non-steroidal aryl propionamide SARM developed by Dalton and colleagues at the University of Tennessee, the structural precursor to ostarine. The compound exhibits tissue-selective AR agonism and demonstrated efficacy in osteoporosis and BPH preclinical models. Notable for a dose-dependent visual side effect: yellow-green tint to vision at doses above approximately 50 mg, attributed to non-AR-mediated effects on retinal photoreceptors and pigments. The visual effect is reversible on discontinuation but proved clinically unacceptable for long-term development; GTx redirected development to ostarine for superior tolerability. Andarine retains research utility as the prototype aryl propionamide SARM and is widely used recreationally despite no regulatory approval. Plasma half-life is approximately 4 hours.

3. Mechanism of Action

Non-steroidal aryl propionamide SARM; tissue-selective AR agonism. Reversible yellow-tint visual side effect at supratherapeutic doses.

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

Recreational use commonly 25 to 75 mg daily, in divided doses; trial-relevant pharmacology at 3 to 30 mg/kg in animals.

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. Gao W, et al. Pharmacokinetics and pharmacodynamics of nonsteroidal androgen receptor ligands. Pharm Res 2006.
2. Kearbey JL, et al. Selective androgen receptor modulator (SARM) treatment prevents bone loss and reduces body fat in ovariectomized rats. Pharm Res 2007.
3. Dalton JT, et al. Discovery of nonsteroidal androgens. Biochem Biophys Res Commun 1998.

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