

RESEARCH MONOGRAPH . COMPOUND PROFILE

Sertraline

A naphthylamine SSRI with mild dopamine reuptake inhibition; one of the most prescribed psychiatric medications worldwide.

DOCUMENT	KDC-MN-202
ISSUED	2026-05-09
REVISION	1.0
AUTHOR	Kodiac bioLabs Research
COMPOUND CLASS	Selective serotonin reuptake inhibitor

ABSTRACT

Sertraline ((1S,4S)-4-(3,4-dichlorophenyl)-1,2,3,4-tetrahydro-N-methyl-1-naphthalenamine; CAS 79617-96-2; molecular formula C₁₇H₁₇Cl₂N; molecular weight 306.23) is a tetrahydronaphthalene SSRI synthesized at Pfizer in 1977 and approved by the FDA in 1991 under the trade name Zoloft. SERT affinity is nanomolar (K_i approximately 0.3 nM); the compound exhibits weak dopamine transporter inhibition (K_i approximately 25 nM) that is unusual within the SSRI class and may contribute to a subtly different subjective profile. Plasma half-life is 22 to 36 hours; the principal metabolite N-desmethylertraline is pharmacologically active but with reduced SERT affinity. Hepatic metabolism is via CYP2B6, CYP2C19, CYP2D6, and CYP3A4; clinically relevant CYP2D6 inhibition exists but is weaker than fluoxetine or paroxetine. Approved indications include major depressive disorder, OCD, panic disorder, PTSD, social anxiety disorder, and premenstrual dysphoric disorder. Used as a reference compound in SERT binding studies and animal models of depression and anxiety; the dichlorophenyl moiety is a target structural feature in numerous SSRI structure-activity relationship studies.

1. Compound Identification

Sertraline is described as selective serotonin reuptake inhibitor. A naphthylamine SSRI with mild dopamine reuptake inhibition; one of the most prescribed psychiatric medications worldwide.

1.1 Class summary

Selective serotonin reuptake inhibitor

1.2 Subtitle

A naphthylamine SSRI with mild dopamine reuptake inhibition; one of the most prescribed psychiatric medications worldwide.

2. Abstract

Sertraline ((1S,4S)-4-(3,4-dichlorophenyl)-1,2,3,4-tetrahydro-N-methyl-1-naphthalenamine; CAS 79617-96-2; molecular formula C₁₇H₁₇Cl₂N; molecular weight 306.23) is a tetrahydronaphthalene SSRI synthesized at Pfizer in 1977 and approved by the FDA in 1991 under the trade name Zoloft. SERT affinity is nanomolar (K_i approximately 0.3 nM); the compound exhibits weak dopamine transporter inhibition (K_i approximately 25 nM) that is unusual within the SSRI class and may contribute to a subtly different subjective profile. Plasma half-life is 22 to 36 hours; the principal metabolite N-desmethylertraline is pharmacologically active but with reduced SERT affinity. Hepatic metabolism is via CYP2B6, CYP2C19, CYP2D6, and CYP3A4; clinically relevant CYP2D6 inhibition exists but is weaker than fluoxetine or paroxetine. Approved indications include major depressive disorder, OCD, panic disorder, PTSD, social anxiety disorder, and premenstrual dysphoric disorder. Used as a reference compound in SERT binding studies and animal models of depression and anxiety; the dichlorophenyl moiety is a target structural feature in numerous SSRI structure-activity relationship studies.

3. Mechanism of Action

High-affinity SERT inhibition with weak DAT inhibition. Active metabolite N-desmethylertraline is pharmacologically present but less potent.

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

Clinical 25 to 200 mg per oral administration daily. Rodent studies typically 2 to 20 mg/kg/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. Koe BK, et al. Sertraline, 1S,4S-N-methyl-4-(3,4-dichlorophenyl)-1,2,3,4-tetrahydro-1-naphthylamine, a new uptake inhibitor with selectivity for serotonin. J Pharmacol Exp Ther 1983.
2. DeVane CL, Liston HL, Markowitz JS. Clinical pharmacokinetics of sertraline. Clin Pharmacokinet 2002.
3. Murdoch D, McTavish D. Sertraline. A review. Drugs 1992.

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.