

RESEARCH MONOGRAPH . COMPOUND PROFILE

CX-717

A methylsulfonyl benzoxazine ampakine that advanced furthest of the CX-series in human trials, including military sleep deprivation studies.

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COMPOUND CLASS	Methylsulfonyl benzoxazine ampakine

ABSTRACT

CX-717 (1-(N-methyl-N-methylsulfonyl-aminobenzoyl)pyrrolidine; CAS 412960-03-7) is a methylsulfonyl benzoxazine ampakine developed at Cortex Pharmaceuticals that advanced further in human trials than other CX-series compounds. The compound was studied by DARPA and the Department of Defense for cognitive performance maintenance during sleep deprivation in military personnel; published results showed modest but reproducible improvements in vigilance and working memory performance during 24- to 72-hour sleep deprivation. CX-717 was also studied for adult ADHD with partial Phase 2 results. The compound did not advance to FDA approval. Pharmacokinetics: plasma half-life approximately 3 to 4 hours; oral bioavailability adequate. The compound is sold as a research chemical with limited availability.

1. Compound Identification

CX-717 is described as methylsulfonyl benzoxazine ampakine. A methylsulfonyl benzoxazine ampakine that advanced furthest of the CX-series in human trials, including military sleep deprivation studies.

1.1 Class summary

Methylsulfonyl benzoxazine ampakine

1.2 Subtitle

A methylsulfonyl benzoxazine ampakine that advanced furthest of the CX-series in human trials, including military sleep deprivation studies.

2. Abstract

CX-717 (1-(N-methyl-N-methylsulfonyl-aminobenzoyl)pyrrolidine; CAS 412960-03-7) is a methylsulfonyl benzoxazine ampakine developed at Cortex Pharmaceuticals that advanced further in human trials than other CX-series compounds. The compound was studied by DARPA and the Department of Defense for cognitive performance maintenance during sleep deprivation in military personnel; published results showed modest but reproducible improvements in vigilance and working memory performance during 24- to 72-hour sleep deprivation. CX-717 was also studied for adult ADHD with partial Phase 2 results. The compound did not advance to FDA approval. Pharmacokinetics: plasma half-life approximately 3 to 4 hours; oral bioavailability adequate. The compound is sold as a research chemical with limited availability.

3. Mechanism of Action

AMPA receptor positive allosteric modulator (methylsulfonyl benzoxazine class).

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

100 to 1000 mg per administration in clinical trials.

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. Wesensten NJ, et al. Ampakine (CX-717) effects on performance and alertness during simulated night shift work. Aviat Space Environ Med 2007.

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