

RESEARCH MONOGRAPH . COMPOUND PROFILE

Magnesium L-Threonate

*A proprietary magnesium salt (Magtein)
with claimed superior CNS bioavailability
for cognitive applications.*

DOCUMENT	KDC-MN-167
ISSUED	2026-05-09
REVISION	1.0
AUTHOR	Kodiac bioLabs Research
COMPOUND CLASS	Magnesium salt of L-threonate

RESEARCH USE ONLY

ABSTRACT

Magnesium L-Threonate (Magtein; CAS 778571-57-6) is a proprietary magnesium salt developed at MIT by Guosong Liu's group, complexing magnesium with two molecules of L-threonate (a vitamin C metabolite). The complex was designed for CNS delivery; rodent studies showed elevated brain magnesium levels and synaptic density improvements with chronic supplementation, distinguishing it from other magnesium salts which produce less reliable CNS magnesium elevation. Phase 2 trials in mild cognitive impairment have shown modest but consistent improvements in cognitive endpoint measures. Doses are typically 1 to 2 grams of the salt per day (providing 100 to 200 mg elemental magnesium). The compound is sold as Magtein-branded products and generic equivalents.

1. Compound Identification

Magnesium L-Threonate is described as magnesium salt of l-threonate. A proprietary magnesium salt (Magtein) with claimed superior CNS bioavailability for cognitive applications.

1.1 Class summary

Magnesium salt of L-threonate

1.2 Subtitle

A proprietary magnesium salt (Magtein) with claimed superior CNS bioavailability for cognitive applications.

2. Abstract

Magnesium L-Threonate (Magtein; CAS 778571-57-6) is a proprietary magnesium salt developed at MIT by Guosong Liu's group, complexing magnesium with two molecules of L-threonate (a vitamin C metabolite). The complex was designed for CNS delivery; rodent studies showed elevated brain magnesium levels and synaptic density improvements with chronic supplementation, distinguishing it from other magnesium salts which produce less reliable CNS magnesium elevation. Phase 2 trials in mild cognitive impairment have shown modest but consistent improvements in cognitive endpoint measures. Doses are typically 1 to 2 grams of the salt per day (providing 100 to 200 mg elemental magnesium). The compound is sold as Magtein-branded products and generic equivalents.

3. Mechanism of Action

Magnesium salt with claimed superior CNS bioavailability. Synaptic density improvements in rodent models.

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

1 to 2 grams of the salt per day (~144-288 mg elemental Mg).

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. Slutsky I, et al. Enhancement of learning and memory by elevating brain magnesium. Neuron 2010.

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.