

RESEARCH MONOGRAPH . COMPOUND PROFILE

Lithium Orotate

A lithium salt of orotic acid sold as a low-dose dietary supplement for mood and cognitive applications, distinct from prescription lithium carbonate.

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COMPOUND CLASS	Lithium-orotate complex

ABSTRACT

Lithium orotate is a salt of lithium with orotic acid (a pyrimidine biosynthesis intermediate). The compound is sold as a dietary supplement at low doses (typically 5 to 20 mg of lithium ion per day, vs. clinical lithium carbonate doses providing 200 to 1200 mg lithium ion per day for bipolar disorder). At supplement doses, lithium plasma concentrations are well below the therapeutic and toxic ranges of clinical lithium use. The pharmacology of low-dose lithium for mood and cognitive applications is debated; some epidemiological studies suggest reduced suicide rates and dementia incidence in regions with higher dietary lithium, but the magnitude is small and confounded. Doses are typically 5 to 20 mg lithium ion per day from supplements.

1. Compound Identification

Lithium Orotate is described as lithium-orotate complex. A lithium salt of orotic acid sold as a low-dose dietary supplement for mood and cognitive applications, distinct from prescription lithium carbonate.

1.1 Class summary

Lithium-orotate complex

1.2 Subtitle

A lithium salt of orotic acid sold as a low-dose dietary supplement for mood and cognitive applications, distinct from prescription lithium carbonate.

2. Abstract

Lithium orotate is a salt of lithium with orotic acid (a pyrimidine biosynthesis intermediate). The compound is sold as a dietary supplement at low doses (typically 5 to 20 mg of lithium ion per day, vs. clinical lithium carbonate doses providing 200 to 1200 mg lithium ion per day for bipolar disorder). At supplement doses, lithium plasma concentrations are well below the therapeutic and toxic ranges of clinical lithium use. The pharmacology of low-dose lithium for mood and cognitive applications is debated; some epidemiological studies suggest reduced suicide rates and dementia incidence in regions with higher dietary lithium, but the magnitude is small and confounded. Doses are typically 5 to 20 mg lithium ion per day from supplements.

3. Mechanism of Action

Lithium ion delivery; mechanism shared with prescription lithium (GSK-3 inhibition, IMPase inhibition) but at substantially lower exposures.

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

5 to 20 mg lithium ion per day from supplements.

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. Schrauzer GN. Lithium: occurrence, dietary intakes, nutritional essentiality. J Am Coll Nutr 2002.

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