

## RESEARCH MONOGRAPH . COMPOUND PROFILE

# Taurine

*An endogenous sulfonate amino acid with osmolyte, calcium-handling, and bile acid conjugation roles, recently associated with longevity in animal models.*

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| AUTHOR         | Kodiac biolabs Research            |
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## ABSTRACT

Taurine (2-aminoethanesulfonic acid; CAS 107-35-7; molecular formula  $\text{C}_2\text{H}_7\text{NO}_3\text{S}$ ; molecular weight 125.15) is an endogenous sulfonate "amino acid" (taurine has a sulfonate group rather than a carboxylate) with widespread tissue distribution and multiple physiological roles: bile acid conjugation, osmotic regulation, calcium handling in cardiac tissue, and modulation of GABA and glycine neurotransmission. Plasma taurine declines with age. A 2023 Science paper (Singh et al.) demonstrated that taurine supplementation extends lifespan and healthspan in mice, monkeys, and worms; the result generated significant interest in taurine as a longevity intervention. Doses for longevity applications are typically 3 to 6 grams per day; doses for cardiovascular and exercise applications are 1 to 6 grams. Excellent safety profile.

# 1. 1. Compound Identification

**Taurine** is described as conditional amino acid / sulfonate. An endogenous sulfonate amino acid with osmolyte, calcium-handling, and bile acid conjugation roles, recently associated with longevity in animal models.

## 1.1. 1.1 Class summary

Conditional amino acid / sulfonate

## 1.2. 1.2 Subtitle

An endogenous sulfonate amino acid with osmolyte, calcium-handling, and bile acid conjugation roles, recently associated with longevity in animal models.

## 2. 2. Abstract

Taurine (2-aminoethanesulfonic acid; CAS 107-35-7; molecular formula C<sub>2</sub>H<sub>7</sub>NO<sub>3</sub>S; molecular weight 125.15) is an endogenous sulfonate "amino acid" (taurine has a sulfonate group rather than a carboxylate) with widespread tissue distribution and multiple physiological roles: bile acid conjugation, osmotic regulation, calcium handling in cardiac tissue, and modulation of GABA and glycine neurotransmission. Plasma taurine declines with age. A 2023 Science paper (Singh et al.) demonstrated that taurine supplementation extends lifespan and healthspan in mice, monkeys, and worms; the result generated significant interest in taurine as a longevity intervention. Doses for longevity applications are typically 3 to 6 grams per day; doses for cardiovascular and exercise applications are 1 to 6 grams. Excellent safety profile.

### 3. Mechanism of Action

Multiple roles: bile acid conjugation, osmolyte, calcium handling, GABA/glycine modulation. Lifespan extension in mice and monkeys.

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. 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. 5. Reported Research Dose Ranges

1 to 6 grams per 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. 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. 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. 9. References

1. Singh P, et al. Taurine deficiency as a driver of aging. Science 2023.
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