

RESEARCH MONOGRAPH . COMPOUND PROFILE

SRT1720

An imidazothiazole SIRT1 activator; the structural lineage compound from which SRT2104 was developed.

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ABSTRACT

SRT1720 (CAS 925434-55-5; molecular formula C₂₂H₁₉N₅OS₂; molecular weight 433.55) is an imidazothiazole SIRT1 activator developed at Sirtris Pharmaceuticals as a potent (approximately 1000-fold over resveratrol) and selective sirtuin 1 activator. Mechanism is allosteric SIRT1 activation comparable to SRT2104. Mouse studies demonstrated lifespan extension in diet-induced obese mice, improved metabolic parameters, and reduced age-related pathology. The compound was the foundation for the broader Sirtris drug discovery program; SRT2104 was developed as a more drug-like successor with better human pharmacokinetics. SRT1720 is used preferentially in academic research where the established mouse pharmacology is valuable. Plasma half-life is approximately 8 to 10 hours.

1. Compound Identification

SRT1720 is described as selective sirt1 activator. An imidazothiazole SIRT1 activator; the structural lineage compound from which SRT2104 was developed.

1.1 Class summary

Selective SIRT1 activator

1.2 Subtitle

An imidazothiazole SIRT1 activator; the structural lineage compound from which SRT2104 was developed.

2. Abstract

SRT1720 (CAS 925434-55-5; molecular formula C₂₂H₁₉N₅O₂; molecular weight 433.55) is an imidazothiazole SIRT1 activator developed at Sirtris Pharmaceuticals as a potent (approximately 1000-fold over resveratrol) and selective sirtuin 1 activator. Mechanism is allosteric SIRT1 activation comparable to SRT2104. Mouse studies demonstrated lifespan extension in diet-induced obese mice, improved metabolic parameters, and reduced age-related pathology. The compound was the foundation for the broader Sirtris drug discovery program; SRT2104 was developed as a more drug-like successor with better human pharmacokinetics. SRT1720 is used preferentially in academic research where the established mouse pharmacology is valuable. Plasma half-life is approximately 8 to 10 hours.

3. Mechanism of Action

Imidazothiazole SIRT1 allosteric activator; mechanism comparable to SRT2104 with greater potency than resveratrol.

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

Mouse studies 100 mg/kg/day; limited human data.

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. Milne JC, et al. Small molecule activators of SIRT1 as therapeutics for the treatment of type 2 diabetes. Nature 2007.
2. Minor RK, et al. SRT1720 improves survival and healthspan of obese mice. Sci Rep 2011.
3. Mitchell SJ, et al. The SIRT1 activator SRT1720 extends lifespan and improves health of mice fed a standard diet. Cell Rep 2014.

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