

RESEARCH MONOGRAPH . COMPOUND PROFILE

IGF-1 LR3

A long-acting analog of IGF-1 with N-terminal extension and Arg3 substitution that reduces IGFBP binding and extends plasma half-life.

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ABSTRACT

IGF-1 LR3 (Long R3 IGF-1; CAS 946870-92-4; molecular weight 9111) is a recombinant analog of human IGF-1 with two structural modifications: a 13-residue N-terminal extension derived from the methionyl-N-terminal region of porcine GH, and substitution of arginine for glutamic acid at position 3. Both modifications reduce binding to IGF binding proteins (IGFBPs), which extends the plasma half-life and increases free bioavailable IGF-1 activity at IGF-1 receptors. The compound was originally developed for cell culture applications (mammalian cell growth media); research-grade availability supports investigational use. Pharmacokinetics: plasma half-life approximately 20 to 30 hours (versus 12 to 15 hours for native IGF-1). The compound is sold as a research chemical at concentrations typically 1 mg/mL. Investigational doses for performance applications range widely (20 to 100 micrograms per day) but the safety profile of long-term IGF-1 elevation is poorly characterized; chronic IGF-1 elevation is implicated in increased cancer risk and acromegalic features.

1. Compound Identification

IGF-1 LR3 is described as long arg3 igf-1 analog. A long-acting analog of IGF-1 with N-terminal extension and Arg3 substitution that reduces IGFBP binding and extends plasma half-life.

1.1 Class summary

Long Arg3 IGF-1 analog

1.2 Subtitle

A long-acting analog of IGF-1 with N-terminal extension and Arg3 substitution that reduces IGFBP binding and extends plasma half-life.

2. Abstract

IGF-1 LR3 (Long R3 IGF-1; CAS 946870-92-4; molecular weight 9111) is a recombinant analog of human IGF-1 with two structural modifications: a 13-residue N-terminal extension derived from the methionyl-N-terminal region of porcine GH, and substitution of arginine for glutamic acid at position 3. Both modifications reduce binding to IGF binding proteins (IGFBPs), which extends the plasma half-life and increases free bioavailable IGF-1 activity at IGF-1 receptors. The compound was originally developed for cell culture applications (mammalian cell growth media); research-grade availability supports investigational use. Pharmacokinetics: plasma half-life approximately 20 to 30 hours (versus 12 to 15 hours for native IGF-1). The compound is sold as a research chemical at concentrations typically 1 mg/mL. Investigational doses for performance applications range widely (20 to 100 micrograms per day) but the safety profile of long-term IGF-1 elevation is poorly characterized; chronic IGF-1 elevation is implicated in increased cancer risk and acromegalic features.

3. Mechanism of Action

IGF-1 receptor agonist with reduced IGFBP binding (Arg3 substitution + N-terminal extension). Extended half-life.

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

20 to 100 micrograms SC per day (research-grade); safety of chronic exposure poorly characterized.

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. Tomas FM, et al. Pharmacology of long-R3-IGF-1. J Endocrinol 1993.

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