



Heavy-Labeled MS Protein Standard

Human IGF-1 (lys- $^{13}\text{C}_6$, $^{15}\text{N}_2$, 99%; arg- $^{13}\text{C}_6$, $^{15}\text{N}_4$, 99%)
Catalog No. CNLM-9513

Significance

IGF-1 is a hormone that is similar in structure to insulin. It plays a large role in childhood growth and also has anabolic effects on adults. A labeled version has been used as an internal standard for a mass spectrometry-based assay to test for doping.¹⁻³

Product Description

A 10 µg/mL solution of human IGF-1, with lysine residues labeled as $^{13}\text{C}_6$, $^{15}\text{N}_2$ (99%) and arginine residues labeled as $^{13}\text{C}_6$, $^{15}\text{N}_4$ (99%), in 20 mM sodium phosphate buffer, pH 7, containing 10 mg/mL trehalose.

Product Specifications

Analytical Test	Specification
LC/MS for isotopic incorporation	>99%
SDS-PAGE for purity	>90%
AAA-MS for concentration	10 µg/mL

Additional Information

pH = 7

Storage: Store at -80°C; avoid freeze-thaw cycles

Stability: Retest after 1 year

Molecular weight (calculated):

IGF-1 (unlabeled) = 7649 Da

IGF-1 (lys- $^{13}\text{C}_6$, $^{15}\text{N}_2$, 99%; arg- $^{13}\text{C}_6$, $^{15}\text{N}_4$, 99%) = 7733 Da

Source: *E. coli*

Note: This product contains two structures of labeled IGF-1 with different disulfide connectivities.^{4,5}

Protein Sequence

GPETLCGAELVDALQFVCGDRGFYFNKPTGYGSSRRAPQTGIV
DECCFRSCDLRRLEMYCAPLKPAKSA
(70 AA)

References

- Picard, G., et al. **2012**. PSAQ™ standards for accurate MS-based quantification of proteins: from the concept to biomedical applications. *J Mass Spec*, 47(100), 1353-1363.
- Cox, H.D., et al. **2013**. Quantification of insulin-like growth factor-1 in dried blood spots for detection of growth hormone abuse in sport. *Anal Bioanal Chem*, 405:1949-1958.
- Cox, H.D., et al. **2014**. Interlaboratory agreement of insulin-like growth factor-1 concentrations measured by mass spectrometry. *Clin Chem*, 60(3), 541-548.
- Chang, J.Y., et al. **1999**. Analysis of the extent of unfolding of denatured insulin-like growth factor. *Prot Sci*, 8:1463-1468. Cambridge University Press. Printed in the USA.
- Miller, J.A., et al. **1993**. Oxidative refolding of insulin-like growth factor 1 yields two products of similar thermodynamic stability: a bifurcating protein-folding pathway. *Biochem*, 32(19), 5203-5313.

