



**LD Biopharma, Inc.**  
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## - PRODUCT DATA SHEET -

**Name of Product:** Recombinant Human ALKBH3-11R Protein  
**Catalog Number:** HRP-2663  
**Manufacturer:** LD Biopharma, Inc.

### Introduction

The E.coli AlkB protein protects against the cytotoxicity of methylating agents by repair of the specific DNA lesions generated in single-stranded DNA. ALKBH2 and ALKBH3 are E. coli AlkB homologs that catalyze the removal of 1-methyladenine and 3-methylcytosine. As dioxygenase, Human ALKBH3 protein mediates demethylation of DNA and RNA containing 1-methyladenosine (m1A). It repairs alkylated DNA containing 1-methyladenosine (m1A) and 3-methylcytosine (m3C) by oxidative demethylation. ALKBH3 has a strong preference for single-stranded DNA. It is able to process alkylated m3C within double-stranded regions via its interaction with ASCC3, which promotes DNA unwinding to generate single-stranded substrate needed for ALKBH3. It also acts on RNA. ALKBH3 demethylates N<sup>1</sup>-methyladenosine (m1A) RNA, an epigenetic internal modification of messenger RNAs (mRNAs) highly enriched within 5'-untranslated regions (UTRs) and in the vicinity of start codons. It requires molecular oxygen, alpha-ketoglutarate and iron.

Full-length human ALKBH3 cDNA (285aa, derived BC0067257) was constructed with codon optimization using gene synthesis technology and expressed with a small T7-His-TEV cleavage site Tag (29aa) fusion at its N-terminal and 11 Poly-Arginine (11R) tag at its C-terminal. It was expressed in E. coli as inclusion bodies. The final product was refolded using our unique “temperature shift inclusion body refolding” technology and chromatographically purified.

**Gene Symbol:** ALKBH3 ( ABH3; DEPC-1; hABH3; PCA1 )  
**Accession Number:** NP\_631917  
**Species:** Human  
**Size:** 50 µg / Vial  
**Composition:** 1.0 mg/ml, sterile-filtered, in 20 mM pH 8.0 Tris-HCl Buffer, with proprietary formulation of NaCl, KCl, EDTA, Sucrose and DTT.  
**Storage:** In Liquid. Keep at -80°C for long term storage. Product is stable at 4 °C for at least 30 days.

### Key References



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Stefansson OA, et al., *CpG promoter methylation of the ALKBH3 alkylation repair gene in breast cancer*. BMC Cancer 17 (1), 469 (2017)

Kogaki T, et al., *TP53 gene status is a critical determinant of phenotypes induced by ALKBH3 knockdown in non-small cell lung cancers* Biochem. Biophys. Res. Commun. 488 (2), 285-290 (2017)

Ueda Y, et al., *AlkB homolog 3-mediated tRNA demethylation promotes protein synthesis in cancer cells*. Sci Rep 7, 42271 (2017)

## Applications

1. May be used for ALKBH3 mediated epigenetic pathway regulation study in various cells by intracellular delivery of this ALKBH3-11R protein directly in vitro cell culture
2. May be used for mapping ALKBH3 protein-protein interaction.
3. May be used as specific substrate protein for kinase, and ubiquitin (Sumo pathway) related enzyme functional screening assays.
4. Potential biomarker protein / therapeutic target protein for cancer prognosis and cancer treatment drug development.
5. As native human ALKBH3 immunogen for specific antibody production.

## Quality Control

Purity: > 94 % by SDS-PAGE.

## Recombinant Human ALKBH3 -11R Protein Sequence ( 24.8 kD )

MASMTGGQQMGRGHHHHHENLYFQGGEFEEKRRRARVQGAWAAPVKSQAIAQPATTAKSHLHQ  
KPGQTWKNKEHHLSDREFVFKEPQQVVRRAPEPRVIEEGVYEISLSPTGVSRCVCLYPGFVDVKE  
ADWILEQLCQDVPWKQRTGIREDSSILQLTFKKSAPVSGTATAPQSCWYERPSPPHIPGPAILTR  
TRLWAPESGGGSPGRRRRRRRRRR