Product Manual

Product Name	LbCas12a
Source	Recombinant expression in Escherichia coli
Catalog Number	CSB-DEM028
Physical Form	Liquid
Storage Conditions	-20 ±5°C
Molecular Weight	143.7 kDa
Storage Buffer	20 mM Tris-HCl (pH 7.5), 200 mM NaCl, 20% glycerol, 1 mM DTT
Quality Control	No residual nucleases (exonucleases and endonucleases)
Shelf Life	12 months

Product Descriptionp

Cas12a (also known as Cpf1) is a type II V CRISPR effector protein. It is an RNA-guided endonuclease that binds to specific target DNA sites and cleaves them under the guidance of single-stranded guide RNA. Cas12a has been widely used in gene editing of microorganisms, plants, and animals, and holds great potential in molecular diagnostics. While Cas12a recognizes and cleaves target double-stranded DNA (substrate), its activity to efficiently cleave arbitrary sequence single-stranded DNA (ssDNA) is also activated. By designing probes labeled with fluorescence or other small molecule markers at both ends, signal amplification of DNA detection by CRISPR/Cas12a can be achieved. Common detection methods include real-time fluorescence and colloidal gold assays. Due to gRNA-specific recognition of the target region, the CRISPR/Cas12a

system acts as a "secondary screening" for the analyzed DNA or DNA amplification products, thus exhibiting high specificity.

Product components

Component No.	Component Name	Specifications(100pmol)	Specifications(2000pmol)	Specifications(2000pmol)
1	10×Cas12 Buffer	250μL	5mL	5mL
2	LbCas12a	10μl(10 μM)	200μl(10 μM)	100μl(20 μM)

Operating Instructions

1. Preparation of Reaction Substrate:

DNA amplification products can be prepared using various methods, including but not limited to RDA, LAMP, PCR, etc.

2. Recommended Reaction System and Program

Component	Addition amount
ddH_2O	Up to 50 μL
10×Cas12 Buffer	1×
Fluorescent Probe or Colloidal Gold Probe	40 nM

gRNA	10-50 nM
LbCas12a	12-50 nM
Reaction Substrate	2μL

3. Recommended Reaction System and Program

Fluorescence Method: If using an enzyme marker, set up the program and preheat in advance.

Temperature	Time	Cycles
37°C	30 -60min	1

Read fluorescence values every 4 minutes.

Colloidal Gold Method: Perform the reaction at 37°C for 15-30 minutes using an instrument with heating function such as a water bath or metal bath.

Precautions:

1. Reagents to be provided by the customer: Probes, gRNA, and other components.
2. Probes can be used for real-time fluorescence detection in combination with fluorescent probes, or for colloidal gold detection in combination with matching test strips.
3. gRNA can be designed using the gRNA design method of CRISPR/Cas12 or online gRNA design tools.
4. Applicable Instruments: For fluorescence detection, a recommended option is to use an enzyme marker such as BioTek Synergy; alternatively, other quantitative PCR instruments with FAM fluorescence channels can be selected.

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