Ultra Nuclease

Cat.No.: HYI221

Product Description

Ultra Nuclease is a genetically engineered endonuclaese derived from Serratia marcescens, which is capable of degrade DNA or RNA, either double or single stranded, linear or circular under a wide range of condition, completely degrade nucleic acids into 5'-monophosphate oligonucleotides with 3-5 base length. After genetic engineering modification, the product was fermented, expressed, and purified in E. coli, which reduces the viscosity of cell supernatant and cell lysate in scientific research, but also improve the purification efficiency and functional research of protein. It can also be used in the gene therapy, virus purification, vaccine production, protein and polysaccharide pharmaceutical industry as a host residue nucleic acid removal reagent.

Components

Components	5 KU	50KU	500KU	5000KU
Ultra Nuclease	20μL	200μL	2mL	20mL

Product Features

CAS No.	9025-65-4
EC No.	3.1.30.2
Molecular Weight	30kDa
Isoelectric Point	6.85
Protein Purity	≥99%（SDS-PAGE & SEC-HPLC）
Specific Activity	≥1.1×10^6U/mg
Optimum Temperature	37°C
Optimum pH	8.0
Protease Activity	negative
Bioburden	＜10CFU/100,000U
Residual Host-cell Protein	≤10ppm
Heavy Metal	≤10ppm
Bacterial Endotoxin	＜0.25EU/1000U
Storage Buffer	20mM Tris-HCl, pH 8.0, 2mM $MgCl_2$, 20mM

NaCl，50% Glycerol

Storage

≤0°C transportation；-25~-15°C Storage，2 years validity (avoid freezing-thawing)

Unit Definition

The amount of enzyme used to change the absorption value of A260 by 1.0 within 30min at 37 °C, pH 8.0, equivalent to digested 37μg salmon sperm DNA by cutting into oligonucleotides, was defined as an active unit (U).

Quality Control

1. Residual Host-cell Protein: ELISA kit
2. Protease Residues: 250KU/mL Ultra Nuclease reacted with substrate for 60min, no activity was detected.
3. Bacterial Endotoxin: LAL-Test, Pharmacopoeia of the People's Republic of China Volume 4 (2020 Edition) gel limit test method. General Rules（1143）.
4. Bioburden: Pharmacopoeia of the People's Republic of China Volume 4 (2020 Edition)—General Rules for Sterility Test (1101), PRC National Standard, GB 4789.2-2016.
5. Heavy Metal: ICP-AES, HJ776-2015.

Operation

1. UltraNuclease activity was significantly inhibited when SDS concentration was over 0.1% or EDTA concentration was over 1mM.
2. Surfactant Triton X-100, Tween 20 and Tween 80 had no effect on nuclease properties when the concentration was under 1.5%.

Operation	Optimal Operation	Valid Operation
Temperature	37℃	0-45℃
pH	8.0-9.2	6.0-11.0
Mg^{2+}	1-2mM	1-15mM
DTT	0-100mM	＞100mM
2-Mercaptoethanol	0-100mM	＞100mM
Monovalent metal ion（Na^+，K^+ etc.）	0-20mM	0-200mM
PO_4^{3-}	0-10mM	0-100mM

"Optimal" is defined as the condition under which UltraNuclease retains > 90% of its activity "Effecti ve" is defined as the condition under which UltraNuclease retains > 15% of its activity.

Usage and Dosage

1. Remove exogenous nucleic acid from vaccine products, reduce the risk of residual nucleic acid toxicity and improve product safety.
2. Reduce the viscosity of feed liquid caused by nucleic acid, shorten processing time and increase protein yield.
3. Remove the nucleic acid which wrapped particle (virus, inclusion body, etc.), which is conducive to the release and purification of the particle.
4. Nuclease treatment can improve the resolution and recovery of the sample for column chromatography, electrophoresis and blotting analysis.
5. In gene therapy, nucleic acid is removed to obtain purified adeno-associated viruses.

Experimental Type	Protein Production	Virus, Vaccine	Cell Drugs
Cells Number	1g cell wet weight (resuspended with 10 ml buffer)	1L fermentation Liquid supernatant	1L culture
Minimum Dosage	250U	100U	100U
Recommended Dosage	2500U	25000U	5000U
Function Time	Recommended reaction at 37 ℃ for 15~60min, or reaction at 25℃ for 30~120min		

If the solution is high-salinity, acidic or alkaline or with high concentration of detergent denaturant, it should be appropriate to increase the amount of enzyme or extend the incubation time.

Notes

1. Storage of UltraNuclease at 4 °C for two weeks does not affect the biological activity, long-term storage at 4°C is not recommended.
2. Avoid freezing-thawing at -80 °C, recommended storage at -25~-15 °C.
3. Avoid contamination by contact with other enzymes used in molecular diagnosis during application.
4. For your safety and health, please wear lab coat and gloves.