

## Product Information

### Proteinase K Solution (20mg/mL)

Catalogue Number	Size
ATR-N708	1 mL ≥ 600 U/mL (20 mg/mL)

## Product Description

Proteinase K is a potent subtilisin-like serine protease known for its robust proteolytic activity. It is naturally secreted from cultures of *Tritirachium album*, with the "K" designation reflecting its affinity for keratin, the primary carbon and nitrogen source for *Tritirachium album*. This enzyme exhibits both endo- and exoproteolytic activity and is calcium-dependent, with optimal activity observed at calcium concentrations ranging from 1 to 5 mM. Proteinase K preferentially digests proteins after hydrophobic amino acids, including aliphatic and aromatic residues. Extended incubation times and higher enzyme concentrations lead to complete protein digestion.

Proteinase K possesses two Ca<sup>2+</sup> ion binding sites that contribute to its structural stability, although they are not directly involved in catalysis. Removal of these calcium ions reduces enzyme stability but does not diminish proteolytic activity significantly. For nucleic acid purification, proteinase K digestion is typically performed in the presence of EDTA to inhibit magnesium-dependent enzymes. The enzyme exhibits optimal activity at pH 8 but remains active over a wide pH range.

## Applications

- Isolation of genomic DNA
- Removal of DNases and RNases
- Determination of enzyme localization
- Improving cloning efficiency of PCR products

## Highlights

- Ready-to-use solution
- Active in a wide range of reaction conditions

## Note

- The recommended working concentration of Proteinase K is 0.05 to 1 mg/mL. The activity of the enzyme is stimulated by 0.2 to 1% SDS or by 1 to 4 M urea.
- Ca<sup>2+</sup> protects Proteinase K against autolysis, increases thermal stability, and has a regulatory function for the substrate binding site of Proteinase K.
- Stable over a wide pH range: 4 to 12, optimum pH 7.5 to 8.0.
- Optimum activity at 50 to 55°C.
- Rapid denaturation of enzyme occurs at temperatures above 65°C.

## Inhibition and Inactivation

Elevating the reaction temperature to 50-60°C or adding 0.5-1% SDS can enhance its activity, while temperatures exceeding 65°C or exposure to trichloroacetic acid or serine protease inhibitors like phenylmethylsulfonyl fluoride (PMSF), diisopropyl fluorophosphate (DFP), or 4-(2-aminoethyl)benzenesulfonyl fluoride (AEBSF) can inhibit its function. Proteinase K is unaffected by EDTA, urea, SDS, citrate, iodoacetic acid, or other serine protease inhibitors such as N-alpha-tosyl-L-lysyl chloromethyl ketone (TLCK), or N-alpha-tosyl-L-phenylalanine chloromethyl ketone (TPCK). To inactivate Proteinase K, it should be incubated at a temperature of at least 95°C for a minimum of 10 minutes. It is crucial to ensure that the inactivation conditions meet or exceed these parameters to achieve complete enzyme inactivation.

## Storage

Stored at -20°C.

## Shipping

The enzyme is shipped with ice gel.

## Precautions and Disclaimer

This product is intended for research and development (R&D) purposes only and is not suitable for use in drugs, diagnostic procedures, households, or other applications. When handling the product, always wear appropriate laboratory

attire, including a lab coat, disposable gloves, and protective eyewear. When working with radioactive tracers, adhere to standard safety protocols for handling radioactive materials. For detailed safety information, refer to the relevant material safety data sheets (MSDSs), which are available online as PDF files or upon request via email ([info@atrmed.com](mailto:info@atrmed.com)). To the fullest extent permitted by law, ATR-MED Inc. disclaims liability for any special, incidental, indirect, punitive, multiple, or consequential damages arising from or related to the use of this document, including any associated products. By using this product, you acknowledge and agree to all terms and conditions outlined by ATR-MED. All trademarks mentioned herein are the property of ATR-MED unless otherwise specified.

## Limited Product Warranty

ATR-MED® warrants its products in accordance with the terms outlined in ATR-MED's General Terms and Conditions of Sale, available at [www.atrmed.com/terms-and-conditions.html](http://www.atrmed.com/terms-and-conditions.html). For inquiries regarding warranty coverage or any other concerns, please contact ATR-MED via [www.atrmed.com/support](http://www.atrmed.com/support). ATR-MED warrants that, at the time of quality release or subsequent retest date, this product conforms to the information provided in this publication. However, please note that the information contained in this guide is subject to change without prior notice. Purchasers are responsible for determining the suitability of the product(s) for their specific applications. Additional terms and conditions of sale may be found on the invoice or packing slip.

## Trademarks

ATR-MED® is a registered trademark of Acell Teb Rad Med Iranian.