

# Micrococcal Nuclease

**88216**

2130.1

Number	Description
88216	<b>Micrococcal Nuclease</b> , $\geq 100$ units/ $\mu\text{L}$ , 150 $\mu\text{L}$ , supplied in 10mM Tris•HCl pH 7.5, 50mM NaCl, 1mM EDTA, 50% glycerol Molecular Weight: 16,800 Source: <i>Staphylococcus aureus</i>

**Storage:** Upon receipt store at  $-20^{\circ}\text{C}$ . Product is shipped with dry ice.

## Introduction

Thermo Scientific™ Micrococcal Nuclease is a stable liquid form of the enzyme derived from *Staphylococcus aureus*. Micrococcal Nuclease exhibits exo- and endo-5'-phosphodiesterase activities against DNA and RNA.<sup>1</sup> This enzyme digests double-stranded, single-stranded, circular and linear nucleic acids. The highest activity is toward single-stranded nucleic acid substrates with preference for AT- or AU-rich regions. Enzymatic activity occurs at pH 7-10 and is strictly dependent on calcium for digestion of RNA and DNA substrates. Micrococcal Nuclease is suitable for removing nucleic acids from cell lysates, releasing chromatin-bound proteins and shearing chromatin for use in chromatin immunoprecipitation (ChIP) experiments.

## Important Product Information

- Product is a liquid at  $-20^{\circ}\text{C}$ . Keep enzyme on ice during use.
- Micrococcal Nuclease is dependent on  $\text{Ca}^{++}$  for activity. Avoid calcium chelators, such as EGTA, in reaction buffers.
- Enzyme is active at pH 7-10 with a salt concentration  $< 100\text{mM}$ . Optimal enzyme activity occurs at  $37^{\circ}\text{C}$ ; however, the enzyme is active at room temperature. Monovalent metal ions, such as  $\text{Na}^{+}$  and  $\text{K}^{+}$ , will decrease activity. EGTA or heating to  $65^{\circ}\text{C}$  for 10 minutes will inactivate the enzyme.

## Additional Materials Required

- Reaction Buffer: 50mM Tris•HCl pH 8.0, 5mM  $\text{CaCl}_2$
- 10X Stop Solution (optional): 200mM EGTA, pH 8.0
- 100X BSA (optional): 10mg/mL in phosphate-buffered saline

## Procedure

1. Add Micrococcal Nuclease to the sample diluted in Reaction Buffer.

**Note:** If sample only contains nucleotides (i.e., no protein), add BSA to the Reaction Buffer at a final concentration of 0.1mg/mL.

2. Incubate reaction at  $37^{\circ}\text{C}$  until the nucleotides are degraded.
3. Optional: Stop reaction by adding EGTA, pH 8.0 to a final concentration of 20mM.

## Troubleshooting

Problem	Possible Cause	Solution
Minimal or no nucleotide degradation	No Ca <sup>++</sup> present in the Reaction Buffer	Add a final concentration of 5mM CaCl <sub>2</sub> to the Reaction Buffer
	Reaction not complete	Incubate reaction longer
	Reaction temperature too high/low	Incubate reaction at 37°C
	Incorrect reaction pH	Maintain reaction at pH 7-10 using an appropriate buffer
	Presence of monovalent cations	Reduce monovalent cation concentrations to ≤ 100mM by dialyzing or desalting the sample

## Related Thermo Scientific Products

<b>78840</b>	<b>Subcellular Protein Fractionation Kit</b>
<b>69558</b>	<b>Slide-A-Lyzer™ MINI Dialysis Units plus Float, 3.5K MWCO, 10 units</b>
<b>89882</b>	<b>Zeba™ Spin Desalting Columns, 0.5mL, 25/pack</b>

## Reference

1. Cuatrecasas, P., *et al.* (1967). Catalytic properties and specificity of the extracellular nuclease of *Staphylococcus aureus*. *J Biol Chem* **242(7)**:1541-7.

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