

## Product Information

# Lysozyme from chicken egg white

10 mg/mL

**L3790**

## Product Description

EC Number: 3.2.1.17

CAS Number: 12650-88-3

Synonyms: Muramidase,  
Peptidoglycan *N*-acetylmuramoylhydrolase $E^{1\%}_{281.5\text{ nm}}$ : 26.4 in 0.1 M KCl <sup>1</sup> $E_{mM}$  (280 nm): 36 <sup>2</sup>Isoelectric Point (pI): 11.35 <sup>3</sup>Optimum pH: 9.2 <sup>2</sup>

Lysozyme is widely used in the enzymatic lysis of microbial cells.<sup>4,5</sup> Lysozyme hydrolyzes the  $\beta$ -1,4 glycosidic bond between *N*-acetylglucosamine and *N*-acetylmuramic acid in the polysaccharide backbone of peptidoglycan present in bacterial cell walls. Gram-positive bacterial cell walls contain a high proportion of peptidoglycan and are quite susceptible to hydrolysis by lysozyme. Gram-negative bacteria are less susceptible to hydrolysis, since they have a lower proportion of peptidoglycan and an outer membrane. They may be made more susceptible to lysis by the addition of EDTA, which chelates metal ions in the outer bacterial membrane. This optimizes the lysis of the bacterial cell wall with lysozyme.<sup>6</sup> Lysozyme also hydrolyzes chitin oligosaccharides.<sup>7,8</sup>

Lysozyme consists of a single chain polypeptide of 129 amino acid residues which is cross-linked with 4 disulfide bridges.<sup>9</sup> Its molecular weight is calculated to be 14,307 Da, based upon its amino acid sequence. Lysozyme is inhibited by indole derivatives, which bind to and distort the active site, and imidazole, by formation of a charge-transfer complex.<sup>10</sup> Lysozyme is also inhibited by surface-active agents such as sodium dodecyl sulfate (SDS), sodium dodecanate, and dodecyl alcohol. Other compounds of these types will inhibit lysozyme provided that the carbon chain present is at least 12 or more carbons in length.<sup>11</sup> Lysozyme is also inhibited by *N*-acetylglucosamine (NAG) and lactone analogs of peptidoglycan.<sup>12</sup>

This product is a ready-to-use solution of lysozyme. The lysozyme has been purified from chicken egg white. This lysozyme solution can be used for the purification of both DNA and protein from bacteria.

Several theses<sup>13,14</sup> and dissertations<sup>15,16</sup> have cited use of this product in their protocols.

## Reagent

This solution is supplied as a solution of lysozyme at 10 mg/mL, in 25 mM sodium acetate, pH 4.5, with 50% glycerol.

## Precautions and Disclaimer

For R&D use only. Not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

## Storage/Stability

This product should be stored at  $-20\text{ }^{\circ}\text{C}$ .

## Procedure

The following protocol may be used for the extraction of proteins from *E. coli* with this lysozyme solution. Addition of nucleases, such as benzonase (Cat. No. E1014), may help to reduce the viscosity of the released chromosomal DNA. Protease inhibitors may also be added to prevent breakdown of proteins during cell lysis.

1. Collect the cells that express the protein of interest by centrifuging at  $5,000 \times g$  for 10 minutes.
2. Carefully remove the media from the cell pellet. The cell pellet may be frozen or used fresh.

3. Use 10 mL of CellLytic B (Cat. No. B3553) plus 0.2 mL of lysozyme solution (final concentration of 0.2 mg lysozyme/mL) per gram of cell paste. Mix the sample well to resuspend the cells completely.
4. Incubate the extraction suspension with shaking at room temperature for 10-15 minutes to extract fully the protein from the cells.
5. Centrifuge the extract at 1,900 × *g* for 15 minutes to pellet the insoluble material. (For very viscous extracts, centrifuge at 25,000 × *g* for 15 minutes.)
6. Carefully remove the supernatant containing the soluble proteins. Approximately 90%-95% of the soluble proteins will be found in this fraction.

## References

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