# Product Data Sheet

Product Name: Lysozyme chloride
Cat. No.: GB10076

## Chemical Properties

| | | | |
|---|---|---|---|
| Cas. No. | 9066-59-5 | | |
| Formula | | M.Wt | |
| Solubility | | Storage | -20°C |
| General tips | For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20°C for several months. | | |
| Shipping Condition | Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request. | | |
| Structure | | | |



## Protocol

### Cell experiment [1]:

# Product Data Sheet

| | |
|---|---|
| Cell lines | Vero cells (Monkey Kidney Epithelial Cells, CCL-81) |
| Preparation Method | Vero cells were maintained in Dulbecco's Modified Eagle's Medium (DMEM) supplemented with 10% heat-inactivated fetal calf serum, 2mM glutamine, 100U/mL penicillin, and 100μg/mL streptomycin at 37°C, 5% $CO_2$. Cells were treated with Lysozyme chloride at concentrations ranging from 0.05 to 50mg/mL for 72 hours. |
| Reaction Conditions | 0.05-50mg/mL; 72 hours |
| Applications | Lysozyme chloride exhibited dose-dependent cytotoxicity. At the maximum non-toxic concentration (1mg/mL), Lysozyme chloride showed no significant antiviral activity against SARS-CoV-2 in pretreatment. |

**Animal experiment [2]:**

| | |
|---|---|
| Animal models | BALB/c mice |
| Preparation Method | Mice were intravenously immunized with a single dose of Lysozyme chloride (10μg per mouse) without adjuvant. Spleen cells were collected 5–7 days post-immunization for cellular analysis. |
| Dosage form | 10μg/mouse; i.v.; Single injection. |

# Product Data Sheet

| | |
|---|---|
| Applications | Lysozyme chloride induced a specific primary immune response in mice, with serum antibodies and θ-negative rosette-forming cells (RFC) exclusively recognizing the immunizing antigen. |

References:
[1] Delbue S, Pariani E, Parapini S, et al. Heat-Treated Lysozyme Hydrochloride: A Study on Its Structural Modifications and Anti-SARS-CoV-2 Activity. Molecules. 2023 Mar 21;28(6):2848.
[2] Charreire J, Faure A, Bach JF. Studies on B- and T-cell receptors for lysozyme. Immunology. 1975 Sep;29(3):423-32.

## Background

Lysozyme chloride is an orally active bacteriolytic enzyme that specifically hydrolyzes the β(1-4) glycosidic bonds between N-acetylmuramic acid and N-acetylglucosamine in the peptidoglycan layer of bacterial cell walls, thereby lysing Gram-positive bacteria[1-2]. Lysozyme chloride is a hydrochloride of a basic polypeptide obtained from albumen of hen's egg, and has an activity to hydrolyze mucopolysaccha- rides. Lysozyme chloride contains not less than 0.9mg (potency) of lysozyme per mg, calculated on the dried basis. Lysozyme chloride occurs as white, crystals, or crystalline or amorphous powder. Lysozyme chloride is freely soluble in water, and practically insoluble in ethanol (99.5). Lysozyme chloride is hygroscopic. The pH of a solution of Lysozyme Hydrochloride (3 in 200) is between 3.0 and 5.0. The optimal reaction temperature and pH are: 35°C, pH=6.2. Lysozyme chloride participates in the pathological processes of emphysema by downregulating the protective effect of hyaluronic acid, thereby enhancing elastase-induced damage to elastic fibers; Lysozyme chloride regulatory mechanisms in HIV infection have also been extensively studied[3-4].

In vitro, when Lysozyme chloride (1-40mg/mL) was applied to human embryonic kidney HEK293 cells for 24 hours, Lysozyme chloride did not show cytotoxicity. When combined with ascorbic acid (20mg/mL), Lysozyme chloride slightly stimulated cell proliferation without toxic effects[5]. In Vero cells treated with Lysozyme chloride (0.05-50mg/mL) for 72 hours, Lysozyme chloride significantly inhibited cell viability[6].

# Product Data Sheet

In vivo, after intravenous immunization of BALB/c mice with Lysozyme chloride (10µg per mouse), Lysozyme chloride induced specific humoral and cellular immune responses, promoting the proliferation of antigen-binding B cells and T cells in the spleen[7]. In mice infected with *Mycobacterium tuberculosis* (Ravenel or H37Rv strains) and subcutaneously administered Lysozyme chloride (70-80mg per mouse, starting 30 minutes before infection and continuing for 4-14 days), the treatment failed to significantly extend survival time; in some experiments, Lysozyme chloride even shortened the median survival period and aggravated cardiac tuberculous lesions[8].

References:

[1] Banerjee P, Keener KM, Lukito VD. Influence of carbon dioxide on the activity of chicken egg white lysozyme. Poult Sci. 2011 Apr;90(4):889-95.
[2] Jing T, Du H, Dai Q, et al. Magnetic molecularly imprinted nanoparticles for recognition of lysozyme. Biosens Bioelectron. 2010 Oct 15;26(2):301-6.
[3] Cantor JO, Shteyngart B, Cerreta JM, et al. The effect of lysozyme on elastase-mediated injury. Exp Biol Med (Maywood). 2002 Feb;227(2):108-13.
[4] Sun B, Rempel HC, Pulliam L. Loss of macrophage-secreted lysozyme in HIV-1-associated dementia detected by SELDI-TOF mass spectrometry. AIDS. 2004 Apr 30;18(7):1009-12.
[5] Maslii Y, Garmanchuk L, Ruban O, et al. The Study of the Cytotoxicity, Proliferative and Microbiological Activity of the Medicated Chewing Gum with Ascorbic Acid and Lysozyme Hydrochloride Using Different Culture of Cells. Pharmaceutics. 2023 Jul 5;15(7):1894.
[6] Delbue S, Pariani E, Parapini S, et al. Heat-Treated Lysozyme Hydrochloride: A Study on Its Structural Modifications and Anti-SARS-CoV-2 Activity. Molecules. 2023 Mar 21;28(6):2848.
[7] Charreire J, Faure A, Bach JF. Studies on B- and T-cell receptors for lysozyme. Immunology. 1975 Sep;29(3):423-32.
[8] WEISER RS, YOUMANS GP, YOUMANS AS, et al. Lysozyme treatment of tuberculous mice. J Infect Dis. 1958 Jan-Feb;102(1):53-9.

***Caution: Product has not been fully validated for medical applications. For research use only.***
***Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com***
***Address: 10292 Central Ave. #205, Montclair, CA, USA***