nacalai tesque
The quality for certainty.

Zymolyase® (from *Arthrobacter luteus*)

Zymolyase®, produced by a submerged culture of Arthrobacter luteus[1], has strong lytic activity against living yeast cell walls[2],[3] to produce protoplast or spheroplast of various strains of yeast cells. An essential enzyme for the lytic activity of Zymolyase® is β-1,3-glucan laminaripentaohydrolase. It hydrolyzes linear glucose polymers with β-1,3-linkages and releases specifically laminaripentaose as the main and minimum product unit[4], [5], [10], [11].

There are two preparations of Zymolyase®, Zymolyase®-20T and Zymolyase®-100T, having lytic activity of 20,000 units/g and 100,000 units/g respectively. Zymolyase®-20T is ammonium sulfate precipitate while Zymolyase®-100T is a further purified preparation by affinity chromatography[9]. Lytic activity varies depending on yeast strain, growth stage of yeast, or cultural conditions[6-8]. Further informations related to Zymolyase® can be obtained in the reference section below[12-16].

Product Information

Product Name		Zymolyase®-20T	Zymolyase®-100T
Form		Lyophilized Powder	
Purification		Ammonium Sulfate Precipitation	Affinity Chromatography
Activity		20,000 units/g	100,000 units/g
Essential enzyme		β-1,3-glucan laminaripentaohydrolase	
Other activities contained(*1)	β-1,3-glucanase	approx. 1.5 x 10^6 units/g	approx. 1.0 x 10^7 units/g
	protease	approx. 1.0 x 10^4 units/g	approx. 1.7 x 10^4 units/g
	mannanase	approx. 1.0 x 10^6 units/g	approx. 6.0 x 10^4 units/g
Contaminants	Amylase, Xylanase, Phosphatase	Trace amount	Non detectable
Optimum pH and Temp.		pH7.5, 35°C (for lysis of viable yeast cells) pH6.5, 45°C (for hydrolysis of yeast glucan)	
Stability	2°C	No loss of activity was found after storage for 1 year	
Heat stability	30°C	70% of the lytic activity is lost after storage for 3 months	90% of the lytic activity is lost after storage for 3 months
	60°C	Lytic activity is lost on incubation for 5 minutes	
Specificity (Lytic Spectrum)		*Ashbya, Candida, Debaryomyces, Eremothecium, Endomyces, Hansenula, Hanseniaspora, Kloeckera, kluyveromyces, Lipomyces, Metschnikowia, Pichia, Pullularia, Torulopsis, Saccharomyces, Saccharomycopsis, Saccharomycodes, Schwanniomyces*, etc.	

(*1) See reference, Kitamura, K., Kaneko, T., Yamamoto, Y., *J. Gen. Appl. Microbiol.*, **18**, 57 (1972) as to the definition of each enzyme units.

Unit Definition

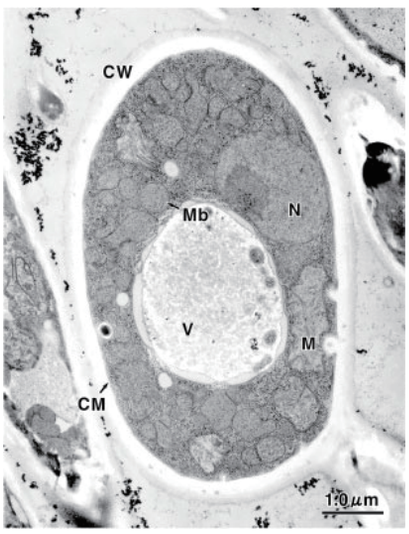
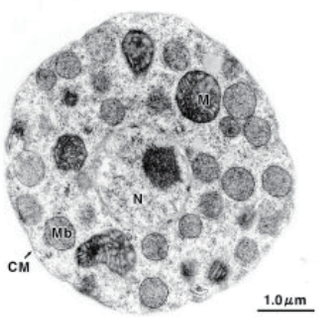
One unit of lytic activity is defined as that amount which indicates 30% of decrease in absorbance at 800 nm (A_{800}) of the reaction mixture under the following condition.

[Reaction Mixture]

Enzyme solution	: 1 ml (0.05-0.1 mg/ml for Zymolyase®-20T) (0.012-0.024 mg/ml for Zymolyase®-100T)
Brewer's yeast cell suspension	: 3 ml (2 mg/ml)
1/15M Phosphate buffer	: 5 ml (pH7.5)
Distilled water	: 1 ml

After incubation for 2 hours at 25°C with gentle shaking, A_{800} of the mixture is determined. When 60% of A_{800} decrease, equivalent to 2 units, is observed in the reaction system, the brewer's yeast cells are completely lysed, namely 1 unit of Zymolyase® lyses 3 mg dry weight of brewer's yeast.

Electron microscopical photo of yeast cell

Yeast cell (*Candida tropicalis*)	Yeast cell (*Candida tropicalis*) after Zymolyase® treatment.
	

CW: Cell Wall
CM: Cell Membrane
M: Mitochondria
Mb: Microbody
N: Nucleus
V: Vacuole

(Data courtesy of Masako Osumi, Emeritus Professor at Nippon Women's University)

Precaution on use

1. Avoid using nitrocellulose filters and use of material other than nitrocellulose when sterilizing. Zymolyase® may be adsorbed on nitrocellulose membranes.
2. Zymolyase® -100T may not be completely dissolved in buffers. Use Zymolyase® as suspension.
3. When sterilized, Zymolyase® is used in a concentration higher than 0.05%, prepare 2% Zymolyase® solution in buffers containing 5% glucose, filter the suspension and dilute the solution with the appropriate buffer.

Reference

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Ordering Information

Product Name	Storage	Product No.	PKG Size
Zymolyase®-20T	R	07663-91	1 g
Zymolyase®-100T	R	07665-55	500 mg

For research use only, not intended for diagnostic or drug use.

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