

Zymolyase[®]

Lytic Enzyme

THE INDUSTRY STANDARD

Protoplast/spheroplast preparation
Yeast cell fusion
Transformation of yeast cells
Yeast genetics

APPLICATIONS OF ZYMOLYASE

- Protoplast/spheroplast preparation
- Yeast cell fusion
- Transformation of yeast cells
- Yeast genetics

Zymolyase[®], purified from culture fluid of *Arthrobacter luteus*, has strong lytic activity against living yeast cell walls to produce protoplast or spheroplast of various strains of yeast cells. Essential enzyme lytic activity of Zymolyase[®] is β -1, 3-glucan laminaripentaohydrolase, which hydrolyzes glucose polymers linked by β -1, 3- bonds and produces laminaripentaose.

There are two preparations of Zymolyase[®], Zymolyase[®] 20T and 100T, having lytic activity of 20,000 units/gram and 100,000 units/gram respectively. Zymolyase[®] 20T is ammonium sulphate precipitate while Zymolyase[®] 100T is a further purified preparation by affinity chromatography. Lytic activity varies depending on strains, fermentation conditions and growth phases of yeast substrate.

Form:	Lyophilized powder		
Purification	Zymolyase [®] 20T:	(NH ₄) ₂ SO ₄ precipitation	
	Zymolyase [®] 100T:	Affinity Chromatography	
Activity:	Zymolyase [®] 20T:	20,000 units/gram	
	Zymolyase [®] 100T:	100,000 units/gram	
Essential enzyme:	β -1,3-glucan laminaripentaohydrolase		
Other activities contained:		Zymolyase[®]-20T	Zymolyase[®]-100T
	β -1,3-glucanase	ca. 1.5 x 10 ⁶ units/g	ca. 1.0 x 10 ⁷ units/g
	Protease	ca. 1.0 x 10 ⁴ units/g	ca. 1.7 x 10 ⁴ units/g
	Mannanase	ca. 1.0 x 10 ⁴ units/g	ca. 6.0 x 10 ⁴ units/g

Contaminants: Trace amounts of amylas, xylanse, phosphatase. No DNase, RNase detected

Optimum pH & temperature: pH 7.5, 35°C (for lysis of viable yeast cells)
pH 6.5, 45°C (for hydrolysis of yeast glucan)

Stable pH: 5~10

Heat stability: The lytic activity is lost on incubation at 60°C for 5 minutes.

Specificity (lytic spectrum)⁵ Ashbya, Candida, Debaryomyces, Eremothecium, Endomyces, Hansenula, Hanseniaspora, Kloeckera, Kluyveromyces, Lipomyces, Metschikowia, Pichia, Pullularia, Torulopsis, Saccharomyces, Saccharomycopsis, Saccharomycodes, Schwanniomyces, etc.

Activity: SH compound such as cystein, 2-mercaptoethanol of dithiothreitol

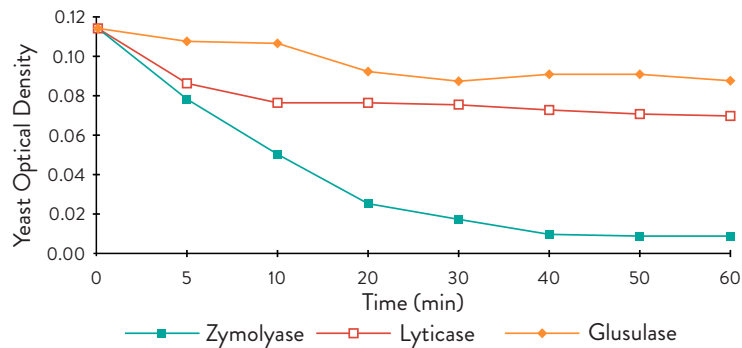
Stability: No loss of activity was found after storage for 1 year at 4°C

PROPERTIES OF ZYMOLYASE

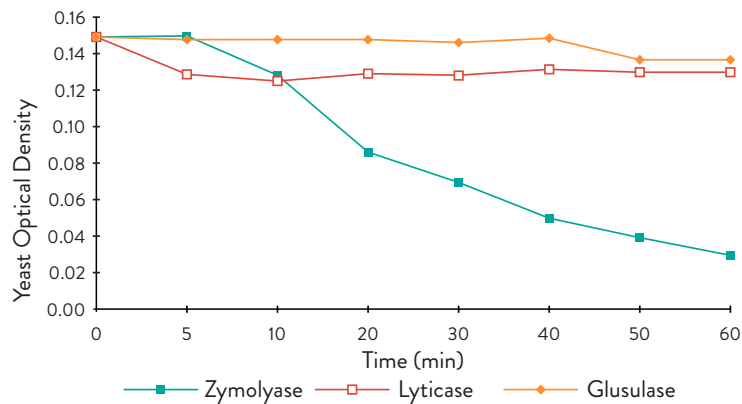
Lytic Spectrum by Zymolyase®

- 1) Susceptible strains in low concentration (0.2 units/ml)**
Ashbya, Endomyces, Kloeckera, Kluyveromyces, Pullularia, Saccharomyces
- 2) Susceptible strains in high concentration (2.0 units/ml)**
Candida, Debaryomyces, Eremothecium, Hansenula, Hanseniaspora, Lipomyces, Metschikowia, Saccharomycopsis, Saccharomyces, Schizosaccharomyces, Selenozyma, Trigonopsis, Wickerhamia
- 3) Susceptible strains in low concentration (0.2 units/ml)**
Ashbya, Endomyces, Kloeckera, Kluyveromyces, Pullularia, Saccharomyces
- 4) Susceptible strains in low concentration (0.2 units/ml)**
Ashbya, Endomyces, Kloeckera, Kluyveromyces, Pullularia, Saccharomyces

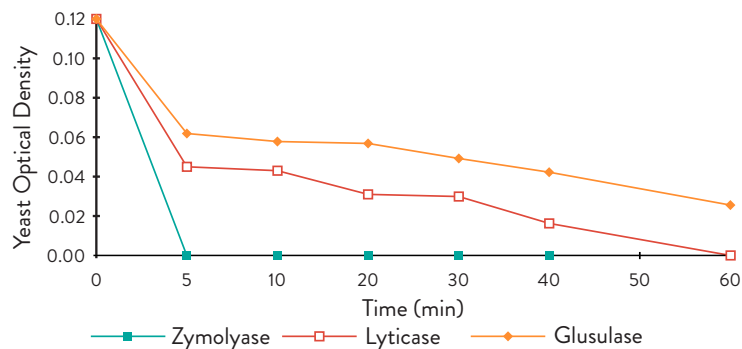
PROTOPLAST FORMATION OF PICHIA USING ZYMOLYASE, LYTCASE, AND GLUSULASE (ENZYMES USED AT 60 U/ML)

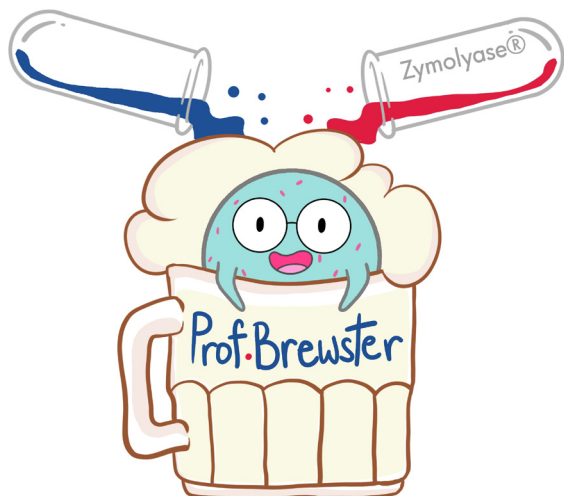


PROTOPLAST FORMATION OF SACCHAROMYCES USING ZYMOLYASE, LYTCASE, AND GLUSULASE (ENZYMES USED AT 60 U/ML)



PROTOPLAST FORMATION OF SACCHAROMYCES USING ZYMOLYASE, LYTCASE, AND GLUSULASE (ENZYMES USED AT 300 U/ML)





Prof. Brewster, the protoplast, wants you to know that Zymolyase® outperforms Lyticase and Glusulase in yeast cell wall degradation.

Zymolyase is very efficient at forming yeast protoplasts while not hindering the regeneration of those protoplasts into viable cells. Both Lyticase and Glusulase at 300 U/ml can only approach the activity of Zymolyase diluted five times to 60 U/ml. Conclusively, Zymolyase can be used at a more dilute concentration for practical applications that competitive enzymes. This lower “user level” makes Zymolyase more cost effective than Lyticase, while Glusulase fails to reach comparable activity.

Featured References

- Journal of Agricultural Chemistry and Environment 2014 February 3:35-40
Sensor with intact or modified yeast cells as rapid device for toxicological test of chemicals
- Nature Protocols 2014 March 9:743-750
Transferring whole genomes from bacteria to yeast spheroplasts using entire bacterial cells to reduce DNA shearing
- Cell 2016 September 6:1397-1410
Domestication and divergence of *Saccharomyces Cerevisiae* beer yeasts
- Methods in Molecular Biology 2017 July 45-56
Direct extraction and purification of recombinant membrane proteins from *pichia pastoris* protoplasts
- Redox Biology 2017 October 13:674-686
Hormesis enables cells to handle accumulating toxic metabolites during increased energy flux

Description	Pack Size	Catalogue No.
Zymolyase® 20T	1 g (20KU/g)	120491-1
Zymolyase® 100T	500 mg (100KU/g)	120493-1