

# NZCYM Broth • NZYM Broth • NZY Broth with Thymine

## Intended Use

NZCYM Broth, NZYM Broth and NZY Broth with Thymine are used for cultivating recombinant strains of *Escherichia coli*.

## Summary and Explanation

NZCYM Broth was developed by Blattner et al. as an enriched medium for cultivating recombinant strains of *E. coli* and propagating  $\lambda$  bacteriophage.<sup>1</sup> *E. coli* grows rapidly in rich media, such as the NZ media, which provide amino acids, vitamins and other metabolites the cell would otherwise have to synthesize.<sup>2</sup>

## User Quality Control

### Identity Specifications

#### Difco™ NZCYM Broth

Dehydrated Appearance:	Light beige, free-flowing, homogeneous.
Solution:	2.2% solution, soluble in purified water. Solution is light to medium amber, clear.
Prepared Appearance:	Light to medium amber, clear.
Reaction of 2.2% Solution at 25°C:	pH 7.0 ± 0.2

#### Difco™ NZYM Broth

Dehydrated Appearance:	Light beige, free-flowing, homogeneous.
Solution:	2.1% solution, soluble in purified water. Solution is light to medium amber, clear.
Prepared Appearance:	Light to medium amber, clear.
Reaction of 2.1% Solution at 25°C:	pH 7.0 ± 0.2

#### BBL™ NZY Broth with Thymine

Dehydrated Appearance:	Fine, homogeneous and free of extraneous material (may contain minute to small dark particles).
Solution:	2.1% solution, soluble in purified water. Solution is light to medium, yellow to tan, clear to slightly hazy.
Prepared Appearance:	Light to medium, yellow to tan, clear to slightly hazy.
Reaction of 2.1% Solution at 25°C:	pH 7.0 ± 0.2

### Cultural Response

#### Difco™ NZCYM Broth or NZYM Broth or BBL™ NZY Broth with Thymine

Prepare the medium per label directions. Inoculate and incubate at 35 ± 2°C for 18-24 hours.

ORGANISM	ATCC™	INOCULUM CFU	RECOVERY
<i>Escherichia coli</i> (C600)	23724	10 <sup>2</sup> -3 × 10 <sup>2</sup>	Good
<i>Escherichia coli</i> (K802)*	33526	10 <sup>2</sup> -3 × 10 <sup>2</sup>	Good

\*For testing NZY Broth with Thymine.

The three variations of NZ media allow the user to select a formulation appropriate to the need.

## Principles of the Procedure

Casein digest, yeast extract, casamino acids and thymine provide the necessary nutrients and cofactors required for excellent growth of recombinant strains of *E. coli*. Due to its higher degree of digestion, casamino acids is an excellent source of free amino acids. Sodium chloride is included in the medium to provide a suitable osmotic environment. Magnesium sulfate/chloride is a source of magnesium ions required in a variety of enzymatic reactions, including DNA replication. Thymine is a growth factor supplement included for those genetic strains of *E. coli* that are unable to synthesize the chemical.

## Formulae

### Difco™ NZCYM Broth

Approximate Formula* Per Liter	
Pancreatic Digest of Casein .....	10.0 g
Casamino Acids .....	1.0 g
Yeast Extract .....	5.0 g
Sodium Chloride .....	5.0 g
Magnesium Sulfate (anhydrous) .....	0.98 g

### Difco™ NZYM Broth

Approximate Formula* Per Liter	
Pancreatic Digest of Casein .....	10.0 g
Yeast Extract .....	5.0 g
Sodium Chloride .....	5.0 g
Magnesium Sulfate (anhydrous) .....	0.98 g

### BBL™ NZY Broth with Thymine

Approximate Formula* Per Liter	
Enzymatic Digest of Casein .....	10.0 g
Yeast Extract .....	5.0 g
Sodium Chloride .....	5.0 g
Magnesium Chloride (anhydrous) .....	0.94 g
Thymine .....	0.1 g

\*Adjusted and/or supplemented as required to meet performance criteria.

## Directions for Preparation from Dehydrated Product

1. Dissolve the powder in 1 L of purified water:  
Difco™ NZCYM Broth – 22 g;  
Difco™ NZYM Broth – 21 g;  
BBL™ NZY Broth with Thymine – 21.1 g.
2. Autoclave at 121°C for 15 minutes.
3. Test samples of the finished product for performance using stable, typical control cultures.

## Procedure

Consult an appropriate reference for recommended test procedures.<sup>3</sup>

## Expected Results

Growth should be evident in the form of turbidity.

## References

1. Blattner, Williams, Blechl, Denniston-Thompson, Faber, Furlong, Grunwald, Kiefer, Moore, Schumm, Sheldon and Smithies. 1977. *Science* 196:161.
2. Ausubel, Brent, Kingston, Moore, Seidman, Smith and Struhl(ed.). 1994. *Current protocols in molecular biology*, vol. 1. Current Protocols, New York, N.Y.
3. Sambrook and Russell. 2001. *Molecular cloning: a laboratory manual*, 3rd ed. Cold Spring Harbor Laboratory, Cold Spring Harbor, N.Y.

## Availability

### Difco™ NZCYM Broth

Cat. No. 240410 Dehydrated – 500 g

### Difco™ NZYM Broth

Cat. No. 241510 Dehydrated – 500 g

### BBL™ NZY Broth with Thymine

Cat. No. 299313 Dehydrated – 500 g