



## Photobacterium Broth

M783

Photobacterium Broth is used for cultivation and demonstration of luminescence of photobacteria.

### Composition\*\*

| Ingredients                        | Gms / Litre |
|------------------------------------|-------------|
| Casein enzymic hydrolysate         | 5.000       |
| Yeast extract                      | 2.500       |
| Sodium chloride                    | 30.000      |
| Ammonium chloride                  | 0.300       |
| Magnesium sulphate                 | 0.300       |
| Ferric chloride                    | 0.010       |
| Calcium carbonate                  | 1.000       |
| Monopotassium dihydrogen phosphate | 3.000       |
| Sodium glycerophosphate            | 23.500      |
| Final pH ( at 25°C)                | 7.0±0.2     |

\*\*Formula adjusted, standardized to suit performance parameters

### Directions

Suspend 65.61 grams in 1000 ml distilled water. Heat just to boiling. Sterilize by autoclaving at 15 lbs pressure (121°C) for 15 minutes. Before pouring mix well to evenly distribute slight precipitate formed.

Note: Due to presence of calcium carbonate, the prepared medium forms opalescent solution with white precipitate.

### Principle And Interpretation

Most luminescent bacteria are marine; they are usually associated with fish and provide the light sources for fish luminescent organs and marking. The light-generating enzyme called luciferase is responsible for luminescence (1). Luminescent bacteria divert upto 10% of their respiratory enzyme into a specific metabolite pathway that converts chemical energy into visible light (2).

Photobacterium Broth is prepared based on the formulations described by Daudoroff (3) and Giese (4) for the cultivation and demonstration of luminescence of photobacteria (5).

Casein enzymic hydrolysate and yeast extract provide nitrogenous compounds, carbon, sulphur, trace nutrients, vitamin B complex, which is essential for the growth of photobacteria. Monopotassium dihydrogen phosphate helps in maintaining the buffering capacity of the medium. Chlorides, sulphate, carbonate and glycerophosphate help for luminescence. The intensity of luminescence is related to the aeration of culture. The greater the oxygen supply, the greater will be the luminescence.

### Quality Control

#### Appearance

Off-white to yellow homogeneous free flowing powder

#### Colour and Clarity of prepared medium

Light amber coloured clear to slightly opalescent solution with heavy white precipitate

#### Reaction

Reaction of 6.56% w/v aqueous solution at 25°C. pH : 7.0±0.2

#### pH

6.80-7.20

#### Cultural Response

M783: Cultural characteristics observed after an incubation at 25-30°C for 18-48 hours .

| Organism                     | Growth         | Luminescens |
|------------------------------|----------------|-------------|
| <i>Lucibacterium harveyi</i> | good-luxuriant | positive    |
| ATCC 14126                   |                |             |

*Vibrio fischeri* ATCC 7744 good-luxuriant positive

### Storage and Shelf Life

Store below 30°C in tightly closed container and the prepared medium at 2 - 8°C. Use before expiry date on the label.

### Reference

1. Norton C.F., 1986, Microbiology, 2nd Ed., Addison-Wesley Publishing Company.
2. Eaton A. D., Clesceri L.S. and Greenberg A. E., (Eds.), 1998, Standard Methods for the Examination of water and Wastewater, 20th Ed., American Public Health Association, Washington, D.C.
3. Daudoroff M., 1942, J. Bacteriol., 44: 451.
4. Giese A.C., 1943, J. Bacteriol., 46: 323.
5. Atlas R.M., 2004, Handbook of Microbiological Media, Lawrence C. Parks (Ed.), 3rd Edition, CRC Press.

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