IVD

# *Listeria* Antisera

*Listeria monocytogenes* is a Gram-positive short-form bacillus having flagella, which does not form endospores. Taxonomically, eight bacterial strains belong to *Listeria*. Among these bacterial strains, one bacterial strain *L. monocytogenes* is considered pathogenic in humans and animals.
These antisera are intended for O-antigen and H-antigen typing of *L. monocytogenes* and each antiserum is a liquid product that contains agglutinins specific to each antigen type. These antisera are prepared by hyper-immunizing rabbits with heat-inactivated whole cells or flagella, heating at 56°C for 30 minutes, and removing cross agglutinins by absorption and filtrating them through a sterilized membrane. Each antiserum contains 0.08 w/v% sodium azide as a preservative.

## PRODUCTS

*Listeria* Antisera are produced from rabbits and contain 0.08% sodium azide as a preservative. Serum following types are provided as 2mL(O-antiserum) or 5mL(H-antiserum) volumes in vials with dropper attachment and ready to use.

Complete Set consists of 12 vials of the individual antisera.
O-antisera (I/II, I, IV, V/VI, VI, VII, VIII and IX) 8 types
H-antisera (A, AB, C and D) 4 types

## INTENDED USE

Determination of *L. monocytogenes* serotype.

## PRINCIPLE OF MEASUREMENT

When this reagent is mixed with *L. monocytogenes* strain which has antigens correspondent to the reagent, the antigen antibody reaction occurs to produce agglutination. This reaction is macroscopically observed to determine each serotype.

## PROCEDURES

### 1. Material required but not provided

Glass slide, Glass pencil, small test tubes, pipette and micropipette, Microbiological loop, physiological saline, physiological saline containing 1 vol% formalin, Water bath(50°C), Antoclave(121°C) or water bath(100°C), Centrifugator

### 2. Preparation of reagents

The antisera are ready for use.

### 3. Specimen

Cultures of organisms which is derived from a pure culture and identified as *L. monocytogenes* by biochemical tests should be serotyped. If the specimen consists of multiple strains, the serotype may not be correctly identified. For determination test of the H type, motile strains should be used.

### 4. Procedures

### A. Determination of the O-antigen

Determination of the O-antigen is carried out with heat-inactivated bacteria using the slide agglutination method.

A dense bacterial antigen suspension should be prepared by suspending cells cultured on a BHI (Brain Heart Infusion) agar plate with 0.2 w/v% sodium chloride to adjust the cell concentration to about 10 mg/mL, heating the suspension at 121°C for 30 minutes followed by centrifugation at 3,000 rpm for 20 minutes, and resuspending the precipitate with a small amount of 0.2 w/v% sodium chloride.

1) Place a drop each of I/II antiserum, V/VI antiserum and physiological saline (30 µL) as a control onto a cleaned glass slide partitioned into several parts with a glass pencil.
2) Place a antigenic suspension for group O (5-10 µL) onto the serum and physiological saline on the slide glass.
3) Mix the reagents with tilting the glass slide back and forth for 1 minute and the agglutination pattern is observed. Agglutination is grossly observed with light through the slide including fluorescent light. It should be first confirmed that no agglutination is found on the reaction with antigenic suspension and physiological saline. Only strong agglutination observed within 1 minutes in the reaction with each serum should be regarded as positive. Delayed or weak agglutination is regarded as negative.
4) If a specimen tests positive with I/II antiserum, perform steps 1-3 above using I and IV antiserum. If positive with V/VI antiserum, using VI, VII, VIII and IX antiserum.

### B. Determination of the H-antigen

Determination of the H-antigen is carried out using the test tube method with the bacteria cultured in liquid media. In order to obtain clear test results, as *L. monocytogenes* possesses only 1 - 4 flagella, it is recommended that the mobility of the testing organisms should be raised by passing them through a semi-liquid agar medium.

1) Organisms passed through the semi-liquid BHI media (0.2% agar) with a Craigie's tube 3 - 4 times may be used for inoculation of the preparatory culture in the liquid BHI medium. Then, a cell suspension should be prepared by culturing in the BHI medium at 30°C overnight and adding an equal amount of physiological saline containing 1 w/v% formalin.
2) Put two drops of each H-antisera into separate test tubes using the syringe attached to the containers and then add 0.5 mL of the cell suspension to each. Use one tube that does not contain the antisera as a control.
3) After mixing thoroughly, keep the tubes in a water bath (50°C - 52°C) for one hour and observe with the naked eye as to whether agglutination occurs or not. Take care not to agitate the tubes during observation since the agglutinant tends to break up easily. The name of the antiserum that produced positive agglutination should be taken as the name of the H-antigen possessed by the tested *L. monocytogenes*.

## INTERPRETATION OF THE RESULTS

The serotype of the *L. monocytogenes* should be determined according to the combination of O-antigenic factors and H-antigenic factors (refer to the table below).

Antigen structure of each serotype of *L. monocytogenes*

| Serotype | O-antigen | H-antigen |
|---|---|---|
| 1/2a | I, II, (III) | AB |
| 1/2b | I, II, (III) | ABC |
| 1/2c | I, II, (III) | BD |
| 3a | II, (III), IV | AB |
| 3b | II, (III), IV, (XII), (XIII) | ABC |
| 3c | II, (III), IV, (XII), (XIII) | BD |
| 4a | (III), (V), VII, IX | ABC |
| 4ab | (III), V, VI, VII, IX, X | ABC |
| 4b | (III), V, VI | ABC |
| 4c | (III), V, VII | ABC |
| 4d | (III), (V), VI, VIII | ABC |
| 4e | (III), V, VI, (VIII), (IX) | ABC |
| 7 | (III), XII, XIII | ABC |

## PERFORMANCE

### 1. Sensitivity

1) O sera: When one drop of the product reacted on a glass slide with a reference strain of a known serotype, granular gglutination was grossly observed.
2) H sera: When 2 drops of the product reacted in a small test tube with a reference strain of a known serotype, cotton-wool-like agglutination was grossly observed.

### 2. Specificity

In test performed in a similar manner to the sensitivity test, the antiserum agglutinates only with the reference strain corresponding to the serotype, while in reactions with non-corresponding reference strains, macroscopic agglutination is not observed.

## PRECAUTION FOR USE AND HANDLING

### 1. General precautions

1) This test is for in vitro diagnostic use only.
2) This kits should only be used from sufficiently trained lab staff.

### 2. Precautions of handling

1) All specimens, samples and containers coming into contact with samples should be treated as infectious.
2) If reagent come into contact with skin, mucous membranes of eyes, wash immediately with plenty or water.
3) Do not freeze the reagents nur use past the expiration date as this may result in poor reagent performance.
4) The reagent should be allowed to stand at 15-25°C for at least 30 minutes before use.
5) Used containers should not be used for other purposes.
6) Sera with different production numbers should not be mixed.
7) The reagent should be used according to the described procedures.
8) The reagent should only be used for the intended use.
9) Special precautions should be taken to ensure that the reagent caps are not exchanged.

### 3. Precautions for disposal

1) The reagent contains 0.08 w/v% sodium azide. Sodium azide may react with lead or copper to form explosive heavy metal azides. The reagent should be disposed with a large amount of water.
2) All specimen, spills, inoculated product and equipment used in this test should be treated with one of the following methods.
   [1] Soaking in 0.1 w/v% hypochlorite for 1 hour or more.
   [2] Autoclaving at 121°C for 20 minutes or more.

## STORAGE AND SHELF LIFE

Storage : 2-10°C
Shelf life : Up to the expiry date on the label.

## PACKAGE

*Listeria* Antisera : O serum in a 2 mL vial, H serum in a 5mL vial with a pipette.
- Set : 12vials one package
  * Each serum is separately available.

## REFERENCE

1) Supervised by the Ministry of Health, Labour and Welfare : *Listeria*, Microbiological Test Manual. Bacterial and Fungi Tests, Third edition, Japan Public Health Association, G-21 (1987).

Please feel free to contact us at the following with your questions or comments:
TEL:+81-3-3669-9421 FAX: +81-3-3669-9390

## Symbols

| | |
|---|---|
| LOT | Bath code |
|  | Use by |
|  | In Vitro Diagnostic Medical Device |
|  | Temperature limitation (Store at) |
| REF | Catalogue number |
|  | Consult Instruction for use |
| Cont. | Contents of kit |

CE

**DENKA SEIKEN CO., LTD.**
3-4-2 Nihonbashikayaba-cho, Chuo-ku, Tokyo, Japan

DENKA SEIKEN UK Ltd.
2 Coronation Lane
Oakthorpe, Swadlincote,
Derbyshire DE12 7QY
United Kingdom

2003.9