

EZER™ *Strep. pneumoniae* Antigen Rapid Test

This kit is designed for testing freshly collected urine samples.

INTENDED USE

The EZER™ *Strep. pneumoniae* Antigen Rapid Test is used for qualitative detection of *Streptococcus pneumoniae* antigen in urine to support the diagnosis of *Streptococcus pneumoniae* infection.

BACKGROUND

Streptococcus pneumoniae is the leading cause of community-acquired pneumonia and may be an important cause of unacceptable community-acquired pneumonia. The mortality rate of pneumococcal pneumonia is as high as 30%, depending on bacteremia, age and underlying disease. If not properly diagnosed and treated, *Streptococcus pneumoniae* infection can lead to bacteremia, meningitis, pericarditis, empyema, fulminant purpura, endocarditis and/or arthritis.

Pneumococcal meningitis often leads to irreversible brain damage or brain death, which can occur as a complication of other pneumococcal infections, or it can occur alone. People of all ages can be infected, but more common in children under 5 years of age, adolescents and the elderly. The disease progresses rapidly and can change from mild to coma within a few hours, which makes immediatediagnosis and immediate use of antibiotics for treatment is particularly important.

Despite a few days of proper antibiotic treatment, 20%-30% of patients with pneumococcal meningitis will die. Mortality rate is even higher in children and elderly patients.

The EZER™ *Strep. pneumoniae* Antigen Rapid Test, a lateral flow immunochromatographic assay permits the early diagnosis of *Streptococcus pneumoniae* infection by simple and rapidly detecting the antigen in urine specimens.

PRINCIPLE

This product is a test plate consisting of three parts: the lower part of the sample, the reagent part and the expansion part, and has a long square-shaped carrier. The reagent part comprises a colloidal gold-labeled anti-*Streptococcus pneumoniae* monoclonal antibody A (hereinafter referred to as colloidal gold-labeled antibody A); and the expanded part comprises an immobilized monoclonal antibody B of *Streptococcus pneumoniae* (hereinafter referred to as Anti-*Streptococcus pneumoniae* antibody B) and murine IgG polyclonal antibody (hereinafter referred to as anti-mouse immunoglobulin antibody).

After the sample is dropped from the lower portion of the sample plate of the test plate, the colloidal gold-labeled antibody A is dissolved to form an immune complex with the *Streptococcus pneumoniae* antigen in the sample. The immune complex moves due to the capillary phenomenon of the developing portion, and is captured by the anti-*Streptococcus pneumoniae* antibody B immobilized in the Testing portion [T], so that the Testing portion [T] forms a purple-red band due to the action of the colloidal gold. This purple-red band of the kit can be visually determined to determine the presence of *S. pneumoniae* in the sample. On the other hand, regardless of whether or not *S. pneumoniae* is present in the sample, the remaining colloidal gold-labeled antibody A continues to move in the developing portion, and is captured by the anti-mouse immunoglobulin antibody immobilized in the Control portion [C], and purple-red band is formed by colloidal gold. This shows the normal movement of the colloidal gold marker antibody.

CONTENTS

Test devices (40), Transfer pipette (40), Package insert (1)

STORAGE CONDITIONS

Test devices must be stored at 2~30°C. DO NOT FREEZE. Devices must be brought back to room temperature at time of testing.

WARNINGS AND PRECAUTIONS

1. For in vitro Diagnostic Use
2. Pathogenic microorganisms may be present in clinical specimens. All specimen and the related contaminated items need to be handled, stored and disposed following "Standard Precautions" and institutional guidelines.
3. Do not use kit components beyond the expiration date.
4. Apply universal precaution when performing the test.
5. The test plate should be used immediately after opening the packaging. When it absorbs moisture, the quality deteriorates and an accurate result cannot be obtained.
6. Please do not touch the sample drop and the judgment part of the test board directly by hand.
7. Do not reuse the device.
8. Use a clean, sterile pipette tip for each sample.

9. Please ensure that an appropriate amount of samples are used for testing. Too much or too little sample may lead to deviation of results.
10. If the test is invalid, one should consider the possible improper handling, inaccurate operation procedure, or device quality. Repeat the test with a new device ensuring that the test procedure has been followed accurately.
11. Read the result at 15 min, or up to 30 min. Do not read the result longer than 30 min, because the result might be altered if the device is dry out.
12. All samples and used accessories should be treated as infectious and discarded according to local regulations.

STORAGE CONDITIONS

Test devices must be stored at 2~30°C. DO NOT FREEZE. Devices must be at ambient room temperature at time of testing.

SAMPLE COLLECTION AND PREPARATION

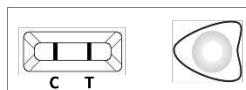
1. Applicable samples: Urine.
2. Urine
 - Take the middle section of urine. Note: When taking a urinary sample, first remove the previous urination and leave the middle section. The last urination should not be retained. Collect urine in a standard container.
 - After collection, if measured within 24 hours, store at room temperature (15~30 °C). In addition, the urine is stored at 2~8°C or stored frozen for 14 days. Boric acid can be used as a preservative. If necessary, urine samples can be transported in leak proof containers at 2~8 °C or in frozen conditions.
3. Note on sample processing:
 - Since removing the cellular components will reduce the sensitivity, do not centrifuge before performing this test.
 - All samples are at risk of infection, please be careful when handling.

PROCEDURE

1. Return the reagent plate to room temperature 15~30°C before use.
2. Open the foil pouch and take out the reagent plate. Once opened, test immediately. Write down the patient's name or number on the reagent plate. (One patient per reagent plate)
3. Mix the samples first.
4. Use a transfer pipette to drop 3 drops or a laboratory pipette to take 100 µL of sample and drop it onto the reagent plate.
5. After 15 minutes, observe the judgment section of the test board.

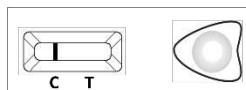
INTERPRETATION OF RESULTS

Allow the samples to react according to the procedure and read the red purple lines that appear in the reading area.



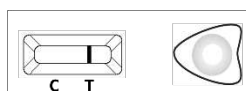
Positive

Two red lines appear. One red line appears in the control region (C), and one red line in the test region (T). This indicates that the specimen contains detectable amount of *Streptococcus pneumoniae* antigen. The shade of color may vary, but it should be considered positive whenever there is even a faint line.



Negative

Only one reddish band appears on control region of the device. No reddish line is visible next to the Test "T". This indicates that there is no detectable *Streptococcus pneumoniae* antigen in the sample.



Invalid Result

No red line appears in the control region (C). The test is invalid even if there is a line in the region (T). Review testing procedures and repeat the test using a new rapid test device.

PRECAUTIONS FOR ASSESSMENT

1. Assessment must be conducted exactly 15 minutes after starting the reaction. Given the nature of the measurement (immunochromatography), the reaction and color development may slightly continue and progress even after 15 minutes.
2. The color tone of the line may vary depending on the color tone and specimen properties. However, the test result is valid as long as a red line is present. Occasionally, broken lines may appear, but the test result is valid as long as a red line is present.
3. If the line is not red at all (e.g., black), the test result is invalid and another test should be performed.
4. If the specimen is dark-colored, it may stain the membrane and affect the assessment.
5. A highly viscous specimen may affect sample migration and/or the reaction, resulting in weak coloration, delayed or no formation of the line, or a nonspecific reaction because of specimen retention.
6. If invalid results are repeatedly obtained for the same specimen, centrifuge the specimen (15,000g, 10 minutes) and use 100 µL of its supernatant as the sample. This may facilitate obtaining valid test results.

REPORTING OF RESULTS

Positive Test	Positive for the presence of <i>Streptococcus pneumoniae</i> antigen.
Negative Test	Negative for the presence of <i>Streptococcus pneumoniae</i> antigen. Infection due to <i>Streptococcus pneumoniae</i> cannot be ruled-out because the antigen present in the sample may be below the detection limit of the test. Culture confirmation of negative samples is recommended.
Invalid Test	Test result is inconclusive. Do not report results.

QUALITY CONTROL

Internal control:

Each EZER™ *Strep pneumoniae* antigen rapid test contains internal/procedural controls. The appearance of a control line at the Control "C" position validates the proper reagent function and assures that the correct test procedure was followed.

PERFORMANCE CHARACTERISTICS

Minimum detection limit

This kit shows positive results when the tests are performed following the specified procedures with positive quality standard solution containing extract of *Streptococcus pneumoniae*, CICC10913 (1.25x10⁵CFU/mL).

Cross-reactivity evaluation

The exception of *Streptococcus pneumoniae*

No crossreactivity was observed with the following bacteria and fungi:

Escherichia coli, *Candida albicans*, *Staphylococcus aureus*, *Enterococcus faecalis*, *Proteus mirabilis*, *Streptococcus viridans*, *Streptococcus pyogenes*, *Streptococcus agalactiae*, *Streptococcus equi*, *Streptococcus dysgalactiae*, *Legionella pneumophila*, *Pseudomonas aeruginosa*, *Citrobacter freundii*, *Klebsiella pneumoniae*, *Bordetella pertussis*, *Salmonella enterica*, *Filobasidiella neoformans*, *Staphylococcus epidermidis*, *Streptococcus bovis*, *Enterococcus faecium*.

Clinical Studies

The performance of the EZER™ *Strep pneumoniae* test was compared to another immunochromatographic assay method ("Another product") at one clinical site. A total of 50 clinical specimens from suspect *Strep pneumoniae* patients were evaluated with the two tests. Table 1: Performance Summary of the EZER™ *Strep pneumoniae* test compared to "Another product" with Percent Agreements

	Another product			
		+	-	Total
Strep. pneumoniae Antigen Rapid Test	+	18	0	18
	-	0	32	32
	Total	18	32	50

Positive result consistency: 100.0% (18/18)

Negative result consistency: 100.0% (32/32)

Overall result consistency: 100.0% (50/50)

INTERFERING SUBSTANCES

Use the influences of glucose (4000 mg/dL), sodium ascorbate (1000 mg/dL), serum albumin (1000 mg/dL), urea (3000 mg/dL), which showed no influence on the assessment results. If the whole blood content in the hematuria sample is > 0.5%, the reagent strip will not flow or affect the interpretation, resulting in incorrect results.

LIMITATIONS OF THE PROCEDURE

1. This kit is a qualitative test and cannot determine the amount of antigen in the sample.
2. *Streptococcus pneumoniae* antigen excreted into the urine reaches the detection limit 3 days after the onset of symptoms, but several weeks may be required in some cases. The assessment results must be interpreted while considering clinical symptoms and history.
3. Do not use this kit to predict therapeutic effects because *Streptococcus pneumoniae* antigen may be excreted into the urine even after healing in some cases.
4. If any bacteria possess a common antigen with *Streptococcus pneumoniae*, such as *S. mitis*, or its antigen is present in the specimen, the assessment result may be false-positive. However.
5. In some cases, *Streptococcus pneumoniae* antigens are excreted into urine the day after vaccination, causing the assessment result to be false-positive. The test should not be performed within 6 days after vaccination.

AVAILABILITY

Product	Cat. No.	Contents
EZER™ <i>Strep pneumoniae</i>	P241108	40 tests

REFERENCES

1. Ruiz Gonzalez A., et al.: Am. J. of Med, 106:385-390, 1999.
2. Priner M., et al.: J Am Geriatr Soc, 56(1):170-171, 2008.

Index of Symbols			
	Attention, see instructions for use		Tests per kit
	For <i>in vitro</i> diagnostic use only		Use by
	Store between 2~30°C		Lot Number
			Authorized Representative
			Do not reuse
			Catalog #

 **Lotus NL B.V.**
 Koningin Julianaplein 10, le Verd, 2595AA,
 The Hague, Netherlands.
 e-mail: peter@lotusnl.com

 **Hangzhou Genesis**
Biodetection and Biocontrol Co., Ltd.
 ADD: NO.139, St.10th (East), Hangzhou Economic &
 Technology Development Zone. Hangzhou,
 Zhejiang Province, China, 310018
 TEL : +86-571-87818163
 FAX : +86-571-8782-4695
 Web: www.genesis-ivd.com