Trinity Biotech

# Uni-Gold™ Legionella Urinary Antigen PLUS

REF 1204401

Pour d'autres langues
Für andere Sprachen
Para otras lenguas
Per le altre lingue
Dla innych języków

Para outras línguas

www.trinitybiotech.com

## INTENDED USE

The Uni-Gold™ Legionella Urinary Antigen PLUS (LUA) test is a rapid immunochromatographic assay for the qualitative detection of *Legionella pneumophila (L. pneumophila)* serogroup 1 antigen in human urine from patients with symptoms of pneumonia. The Uni-Gold™ Legionella Urinary Antigen PLUS test is to be used as an adjunct to other methods for the presumptive diagnosis of Legionella infection (Legionnaire's Disease).

## SUMMARY AND EXPLANATION OF THE TEST

*Legionella pneumophila* was first isolated and characterised in 1976 after a major outbreak of pneumonia in Philadelphia, USA. The causative agent Legionellae, are gram-negative bacteria found in fresh water environments. These organisms are recognised to be a common cause of community acquired and nosocomial pneumonia[1].

Legionellosis classically presents itself as two distinct clinical entities, Legionnaires' disease, a severe multisystem disease involving pneumonia[2] and Pontiac fever, a self- limiting flu like illness[3].

Approximately 80% of Legionella patients excrete soluble Legionella antigen in their urine[4]. This presents the opportunity for rapid detection of Legionella Urinary Antigen (LUA) in urine specimens. Rapid diagnosis and early initiation of antimicrobial therapy can significantly reduce the mortality associated with Legionella pneumonia[5]. The Uni-Gold™ Legionella Urinary Antigen PLUS assay is a rapid immunochromatographic test for the detection of soluble Legionella Urinary Antigen in patients with *Legionella pneumophila* serogroup 1 infection.

## PRINCIPLES OF THE PROCEDURE

The Uni-Gold™ Legionella Urinary Antigen PLUS test is a lateral flow test to detect *Legionella pneumophila* serogroup 1 antigen in human urine. Rabbit anti-*Legionella pneumophila* serogroup 1 is coated onto the test line region of the nitrocellulose zone of the test strip. Goat anti-rabbit IgG is coated onto the control line region. Rabbit anti-*Legionella pneumophila* serogroup 1 antibodies are also conjugated to colloidal gold particles and dried onto inert glass fibre. This is inserted into the test strip below the nitrocellulose zone. A permanent blue line is printed on the laminate cover between the test line region and the control line region. The top of the strip is identified by the abbreviation "LUA".

## REAGENTS

For *in vitro* diagnostic use

### REAGENT DESCRIPTION

**Test devices** - 20 test strips containing immobilised rabbit anti-*Legionella pneumophila* serogroup 1 / goat anti-rabbit IgG and rabbit anti-*Legionella pneumophila* serogroup 1 conjugate.

**Extraction Buffer** – (2.0 ml) phosphate/citrate buffered solution containing surfactants and preserved with Sodium Azide.

**Positive Control** – (0.6 ml) a phosphate buffered saline solution containing heat-inactivated *L. pneumophila* serogroup 1 and urea preserved with Sodium Azide.

**Negative Control** – (0.6 ml) a phosphate buffered saline solution containing urea preserved with Sodium Azide.

### MATERIALS AVAILABLE

- Plastic Pipettes: 21 disposable single use plastic pipettes for addition of urine to test tube.
- Test Tubes: 20 disposable single use plastic tubes.
- Test Tube Holder: Cardboard tube holder

### REAGENTS AND MATERIALS NOT SUPPLIED

Timer.
Standard containers for collection of urine.
Gloves.

## STORAGE AND STABILITY

The Uni-Gold™ Legionella Urinary Antigen PLUS kit must be stored between 15-27˚C.
Do not freeze or store the kit in the refrigerator.

## PRECAUTIONS

- This test is designed for *in vitro* diagnostic use only.
- For professional use only.
- Material should not be pipetted by mouth.
- Treat all materials as if they were infectious and dispose of all material in accordance with local regulation. Liquid waste should be disposed of in a 1% sodium hypochlorite solution or in accordance with local requirements for disposal of infectious material.
- Liquid solutions in this kit contain Sodium Azide at a concentration less than 0.1%, these solutions should be handled with care and when disposed down the drain they should be flushed thoroughly with water.
- Do not use the kit beyond the expiration date.
- The test strip is sealed in a protective foil pouch. Do not use if pouch is damaged or open. Remove test strip from pouch just prior to use. Do not touch the reaction area of test strip.
- Do not use damaged strips. Do not mix components from different kits.
- Use the disposable pipette, tube and strip provided for each specimen tested.
- Do not re-use.

## SPECIMEN COLLECTION AND STORAGE

Urine specimens should be collected in standard sterile containers. If stored at room temperature (18-25˚C), they should be assayed within 24 hours of collection. Alternatively, specimens may be stored at 2-8˚C for up to 14 days, or frozen (-20˚C) for up to 24 months before testing. Samples are no longer deemed suitable when they have had greater than five freeze-thaw cycles.
Urine specimens, stored at 2-8˚C, which contain excess urates, phosphates or other dissolved salts may develop salt crystals after storage. Ensure all samples are at room temperature (18-25˚C) and properly mixed prior to running the test. Ensure frozen samples are fully thawed and mixed prior to testing.
Boric acid may be used as a preservative for stored samples. Boric Acid at a concentration of 8 g/L is routinely used by the manufacturer, and it is recommended that each laboratory should establish the most suitable concentration of Boric Acid as per CLSI Guideline GP-16-A3.

## QUALITY CONTROL

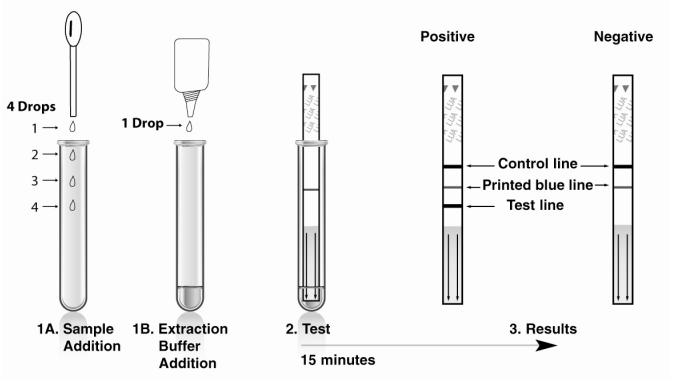
A built-in procedural control on the strip ensures that the test has been performed correctly; this pink/red coloured line should always appear above the printed blue line on the strip. If a line does not appear in the control region discard the strip as this is an invalid test and perform the test again.
It is recommended that the positive and negative controls provided are run with each new kit lot number or as required by your laboratory QA standard operating procedures. If the controls do not read as expected, repeat the test. Contact your local technical support if the QC results continue to be invalid.

## LIMITATIONS

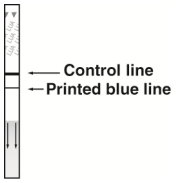
1. The Uni-Gold™ Legionella Urinary Antigen PLUS test has been validated using urine samples only. Other samples (e.g. plasma, serum or other body fluids) that may contain Legionella antigen have not been evaluated. The test cannot be used on environmental samples.
2. A negative test result does not rule out the possibility of infection with *L.pneumophila* serogroup 1 as the antigen may not be present in the urine or is present at a level below the limit of detection. Alternatively, an infection caused by other Legionella species or subgroups may be present.
3. Excretion of Legionella antigen in urine may vary depending on the individual patient and the stage of disease. Some patients have been shown to excrete Legionella antigen for an extended period of time, so a positive reaction may reflect a recent but not active infection.
4. The diagnosis of Legionnaire's disease can not be based on clinical or radiological evidence alone. There is no single satisfactory laboratory test for Legionnaire's disease. Therefore, culture results, serology and/or antigen detection methods should be used in conjunction with clinical findings to make an accurate diagnosis.
5. Diuretic urine samples have not been evaluated with the Uni-Gold™ Legionella Urinary Antigen PLUS test.
6. Haematic urine samples have not been evaluated with the Uni-Gold™ Legionella Urinary Antigen PLUS test.
7. Urine samples presenting high level of sediments may produce an invalid result when concentrated and then tested with the Uni-Gold™ Legionella Urinary Antigen PLUS test.

## TEST PROCEDURE

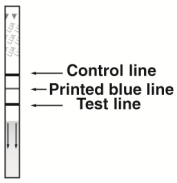
1. Bring patient urine samples to room temperature (18-25˚C).
2. Construct test tube holder provided with the kit.
3. Place the required amount of test tubes in the holder.
4. **To run the controls:** Fill the plastic pipette provided to the highest graduation line and add four drops of the positive or the negative control to assigned test tubes holding the pipette vertically. Then add one drop of extraction buffer (hold the dropper bottle vertically). Agitate gently to mix.
5. **To run patient samples:** Fill the plastic pipette provided to the highest graduation line and add four drops of the patient urine sample to a test tube holding the pipette vertically. Then add one drop of extraction buffer holding the dropper bottle vertically. Agitate gently to mix.
6. Remove each test strip from its pouch immediately before inserting it into the urine sample/extraction buffer mix.
7. Insert the test strip into the test tube with arrow facing downwards and blue triangle at the top of the test and set a timer for 15 minutes.
8. Read results **at** 15 minutes only. Results read after 15 minutes may be inaccurate.



## INTERPRETATION OF RESULTS

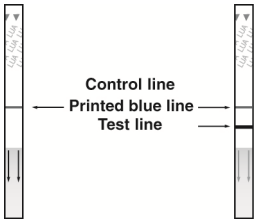



**Negative:** A single pink/red control line of any intensity above the central blue printed line, indicates a presumptive negative result. Report as a presumptive negative for *L. pneumophila* serogroup 1 antigen in urine. This control line indicates that the test functioned correctly, but that *L. pneumophila* serogroup 1 antigen was not detected.




**Positive:** Two pink/red coloured lines of any intensity located **above** and **below** the central blue printed line indicate a presumptive positive result. Report as presumptive positive for *L. pneumophila* serogroup 1 antigen in urine.

An invalid run occurs when no pink/red lines appear on the strip or when the test line alone appears in the absence of the control line. In case of an invalid run, the test should be repeated. Refer to Point 4 and 5 of the test procedure section.




Please note that any reference to a 'line' or a 'line of any intensity' at the test region (below central blue line) of the strip is only deemed a positive test line if it is 'pink/red' in colour. Any other colour at this position, for example grey or shadow line, is not positive and is classified as a negative test result. Similarly, for the control line, a valid control line and hence a valid test can only result from the presence of a 'pink/red line of any intensity' at the control region (above central blue line).

Results of culture, serology and/or antigen detection tests should be used alongside clinical findings, and prevailing outbreak situation. If *Legionella pneumophila* is suspected culture should be performed.

## PERFORMANCE CHARACTERISTICS

**Clinical Sensitivity:**

The sensitivity performance of the Uni-Gold™ Legionella Urinary Antigen PLUS test was evaluated at five different sites using both concentrated and non-concentrated samples. All samples were positive for *Legionella pneumophila* serogroup 1 infection as defined by the European Working Group for Legionella Infections guidelines (2005). Sensitivity evaluation was conducted with 229 non-concentrated samples and 117 concentrated samples. Briefly, to concentrate urine samples, four ml of non-concentrated urine were concentrated by selective ultrafiltration by centrifugation at 3,000g for 15 minutes. When necessary, additional centrifugation steps were conducted in order to obtain a 25-fold concentration.

| NON-CONCENTRATED URINE (n=229) | | Laboratory Diagnosis | |
|---|---|---|---|
| | | Positive | Negative |
| Uni-Gold™ Legionella Urinary Antigen PLUS | Positive | 188 | 0 |
| | Negative | 41 | 0 |

Uni-Gold™ Legionella Urinary Antigen PLUS Sensitivity = 82.1% (95%CI 76 – 87) for non-concentrated urine.

| CONCENTRATED URINE (n=117) | | Laboratory Diagnosis | |
|---|---|---|---|
| | | Positive | Negative |
| Uni-Gold™ Legionella Urinary Antigen PLUS | Positive | 106 | 0 |
| | Negative | 11 | 0 |

Uni-Gold™ Legionella Urinary Antigen PLUS Sensitivity = 90.6% (95%CI 83 – 95) for concentrated urine.

**Clinical Specificity:**

The specificity performance of the Uni-Gold™ Legionella Urinary Antigen PLUS test was evaluated at four different sites using 258 retrospective (frozen) and 352 prospective (fresh) negative urine samples. The evaluation included 610 non-concentrated and 469 concentrated samples. Of the 610 negative samples, 98 where from patients with symptoms of pneumonia from a non-Legionella serogroup 1 etiology, 204 from patients suffering a Urinary Tract Infection, 117 from patients suffering other respiratory tract infections and 191 from normal non-symptomatic individuals.

| NON-CONCENTRATED URINE (n=610) | | Laboratory Diagnosis | |
|---|---|---|---|
| | | Positive | Negative |
| Uni-Gold™ Legionella Urinary Antigen PLUS | Positive | 0 | 5 |
| | Negative | 0 | 605 |

Uni-Gold™ Legionella Urinary Antigen PLUS Specificity = 99.2% (95%CI 98 – 100) for non-concentrated urine.

| CONCENTRATED URINE (n=469) | | Laboratory Diagnosis | |
|---|---|---|---|
| | | Positive | Negative |
| Uni-Gold™ Legionella Urinary Antigen PLUS | Positive | 0 | 10 |
| | Negative | 0 | 459 |

Uni-Gold™ Legionella Urinary Antigen PLUS Specificity = 97.9% (95%CI 96 – 99) for concentrated urine.

**Concordance Study:**

*Legionella pneumophila* serogroup 1 positive urine samples and negative urine samples evaluated in this study were also evaluated with a commercial rapid Legionella test.

The concordance of the Uni-Gold™ Legionella Urinary Antigen PLUS test and a commercial rapid Legionella test was 96.1% for concentrated samples. These data are presented in the following table:

| CONCENTRATED URINE | | Commercial Rapid Legionella test | |
|---|---|---|---|
| | | Positive | Negative |
| Uni-Gold™ Legionella Urinary Antigen PLUS | Positive | 74 | 7 |
| | Negative | 10 | 342 |

The concordance of the Uni-Gold™ Legionella Urinary Antigen PLUS test and a commercial rapid Legionella test was 96.5% for non-concentrated samples. These data are presented in the following table:

| NON-CONCENTRATED URINE | | Commercial Rapid Legionella test | |
|---|---|---|---|
| | | Positive | Negative |
| **Uni-Gold™ Legionella Urinary Antigen PLUS** | Positive | 154 | 7 |
| | Negative | 18 | 527 |

**Reproducibility Study:**

A proficiency panel containing blinded samples was tested by 2 independent operators. The panel consisted of 2 negative samples, 2 low positive samples and 2 high positive samples. These samples were tested in triplicate each day for 3 days, on 2 lots of Uni-Gold™ Legionella Urinary Antigen PLUS tests. 100% of the 216 sample runs produced the expected results.

## REFERENCES


1. Fields, B.S., Benson, R.F., and Besser, R.E. 2002. *Legionella and Legionnaires' Disease: 25 Years of Investigation*. Clin. Micro. Review 15:506-526.
2. Fraser, D. W.,Tsai, T. R., Orenstein, W., Parkin, W. E. , Beecham, H.J., Sharrar, R. G., Harris, J., Mallison, G. F. , Martin, S. M. , McDade, J. E., Shepard, C. C. , and Brachman, P. S. 1977. *Legionnaires' disease: description of an epidemic of pneumonia*. N. Engl. J. Med. 297:1189-1197.
3. Glick, T. H., Gregg, M.B, Berman, B., Mallison, G., Rhodes, W.W., Jr., and Kassanoff I. 1978. *Pontiac fever. An epidemic of unknown etiology in a health department. Clinical and epidemiologic aspects*. Am. J. Epidemiol. 107:149-160.
4. Kohler, R.B., Wilde III C., Johnson, W., Joly, J.,Wheat, L.J., Baker, R., and Misfeldt M. 1988. *Immunologic diversity among serogroup 1 Legionella pneumophilia urinary antigen demonstrated by monoclonal antibody enzyme-linked immunosorbent assays*. J. Clin. Microbiol. 26:2059-2063.
5. Heath, C. H., Grove, D. I., and Looke D. F. 1996. *Delay in appropriate therapy of Legionella-pneumonia associated with increased mortality*. Eur. J. Clin. Microbiol. Infect. Dis. 15:286-290.
6. Guerrero, C., Tolodos, C. M,. Yagüe, G., Ramírez, C., Rodríguez, T. and Segovia, M. 2004. *Comparison of Diagnostic Sensitivities of Three Assays (Bartels Enzyme Immunoassay [EIA], Biotest EIA, and Binax NOW Immunochromatographic Test) for Detection of Legionella pneumophila Serogroup 1 Antigen in urine*. J. Clin. Microbiol. 42:467-468.
7. Domínguez, J.A., Gali, N., Matas, L., Pedroso, P., Fernández, A., Padilla, E., and Ausina, V. 1999. *Evaluation of a rapid immunochromatographic assay for the detection of Legionella antigen in urine samples*. Eur. J. Clin. Microbiol. Infect. Dis. 18:896-898.
8. Domínguez, J.A., Manterola, J.M., Blavia, R., Sopena, N., Belda, F.J., Padilla, E., Giménez, M., Sabriá, M., Morera, J., and Ausina, V. 1996. *Detection of Legionella pneumophila serogroup 1 antigen in nonconcentrated urine and urine concentrated by selective ultrafiltration*. J. Clin. Microbiol. 34:2334-2336.


## ORDERING INFORMATION

| Catalogue No. | Item | Quantity |
|---|---|---|
| 1204401 | Uni-Gold™ Legionella Urinary Antigen PLUS | |

## GUIDE TO SYMBOLS

Consult instructions for use

Temperature limit


Catalogue number


*In vitro* diagnostic medical device

Manufacturer


Batch code

Use–by date


Sodium Azide

Caution

GHS06 Acute Toxicity


Uni-Gold™ Legionella Urinary Antigen Plus


eIFU indicator

| CONTROL | + |
|---|---|

Positive Control

| EXT | BUF |
|---|---|

Extraction Buffer

| CONTROL | - |
|---|---|

Negative Control

| DISPOSABLE | PIPETTES |
|---|---|

Disposable Pipettes

| CONT |
|---|

Contents

| TEST | DEVICES |
|---|---|

Test Devices

| TEST | TUBES |
|---|---|

Test Tubes

CE

| TEST | TUBE | HOLDER | (5 HOLE) |
|---|---|---|---|

Test Tube Holder (5 Hole)

**Trinity Biotech plc,**
**IDA Business Park**
**Southern Cross Road**
**Bray, Co. Wicklow**
**Ireland**
Tel.+ 353 1 2769800
Fax. +353 1 2769888
www.trinitybiotech.com

1204401-29 Rev C
05/2017