SSI DIAGNOSTICA

IMMUVIEW®

S. pneumoniae and *L. pneumophila* Urinary Antigen Test

ENGLISH (UK)

Combined lateral flow test for qualitative detection of *S. pneumoniae* and *L. pneumophila* antigens in urine and *S. pneumoniae* in cerebrospinal fluid

IMMUVIEW® *S. PNEUMONIAE* AND *L. PNEUMOPHILA* URINARY ANTIGEN TEST

For *in vitro* diagnostic use

Intended use

The ImmuView® *S. pneumoniae* and *L. pneumophila* Urinary Antigen Test is intended for diagnosis of *Streptococcus (S.) pneumoniae* and *Legionella (L.) pneumophila* infections by detection of urinary antigens for either or both *S. pneumoniae* and *L. pneumophila* (primarily serogroup 1).

The assay is furthermore intended for diagnosis of *S. pneumoniae* infections by detection of *S. pneumoniae* antigen in cerebrospinal fluid (CSF). The test is a lateral flow test also known as a lateral flow immunochromatographic assay.

Description

ImmuView *S. pneumoniae* and *L. pneumophila* Urinary Antigen Test is a rapid lateral flow test for qualitative detection of *S. pneumoniae* in human urine and CSF samples and *L. pneumophila* (primarily serogroup 1) antigens in human urine samples.

The test is effective in presumptive diagnosis of pneumococcal pneumonia caused by *S. pneumoniae* or *Legionella* pneumonia (Legionnaires' disease) caused by *L. pneumophila*, in conjunction with culture and other methods. Correct and early treatment is vital for the prognosis of both diseases and therefore quick methods to confirm both diseases in the initial phase are very important in order to initiate the proper antibiotic treatment as soon as possible.

Principle

ImmuView *S. pneumoniae* and *L. pneumophila* Urinary Antigen Test is a rapid lateral flow test for detection of *S. pneumoniae* and *L. pneumophila* using the same test.

Precautions

- The presence of partial lines and dots represent INVALID test results. The patient sample should be re-tested.

- Ensure that the test running buffer (RB) is added to all the test tubes and verified as present. **False positive results can occur if no RB is added to the test tubes**.

- Test results should be read within the recommended reading time.

- Do not use the test after the kit lot or components expiry date.

- Do not mix the components of the kit lot with components from other kit lots.

- Let the kit components equilibrate to room temperature before testing.

- Three grey/purple lines indicate plasma/protein present in the urine. The sample should be boiled for 5 minutes before retesting the sample.

Materials Provided

- 1 tube with 22 test strips
- 0.5 mL combined positive control for *S. pneumoniae* and *L. pneumophila*
- 0.5 mL combined negative control for *S. pneumoniae* and *L. pneumophila*
- 2.5 mL running buffer
- 1 tweezer
- 22 transfer pipettes
- 22 test tubes
- 1 cardboard test tube holder
- Scorecard

Quick guide can be found on the inside of the box and on page 8.

Materials Required but not Provided

- Timer
- Sterile standard urine or CSF collection containers/ transport tubes.

Storage and stability

Please find the information on the box and labels.

Preservatives

The use of Boric Acid or piperazine-N,N'-bis(2-ethanesulfonic acid) (PIPES) DO NOT interfere with the ImmuView *S. pneumoniae* and *L. pneumophila* Urinary Antigen Test and can be used.

Sample Collection and Storage

Collect the urine sample in a sterile standard container (with or without boric acid preservative). If the sample is run within 24 hours, it can be stored at room temperature. Alternatively, the sample can be stored at 2-8°C for 1 week or frozen (-20°C). Make sure that samples always reach room temperature before testing. CSF samples should be tested as soon as possible after sampling or be stored frozen until testing is possible. Follow your laboratory procedures for long term storage of CSF samples.

Quality Control

The positive and negative controls provided with ImmuView *S. pneumoniae* and *L. pneumophila* Urinary Antigen Test function as the kit quality control. Follow your local or state requirements for frequency of quality control testing. Before using a new lot of a kit, or a new shipment of the same lot or by a new operator, please perform quality control testing before testing of clinical samples. The positive and negative controls within the kit are tested according to the procedure described in this IFU.

Procedure

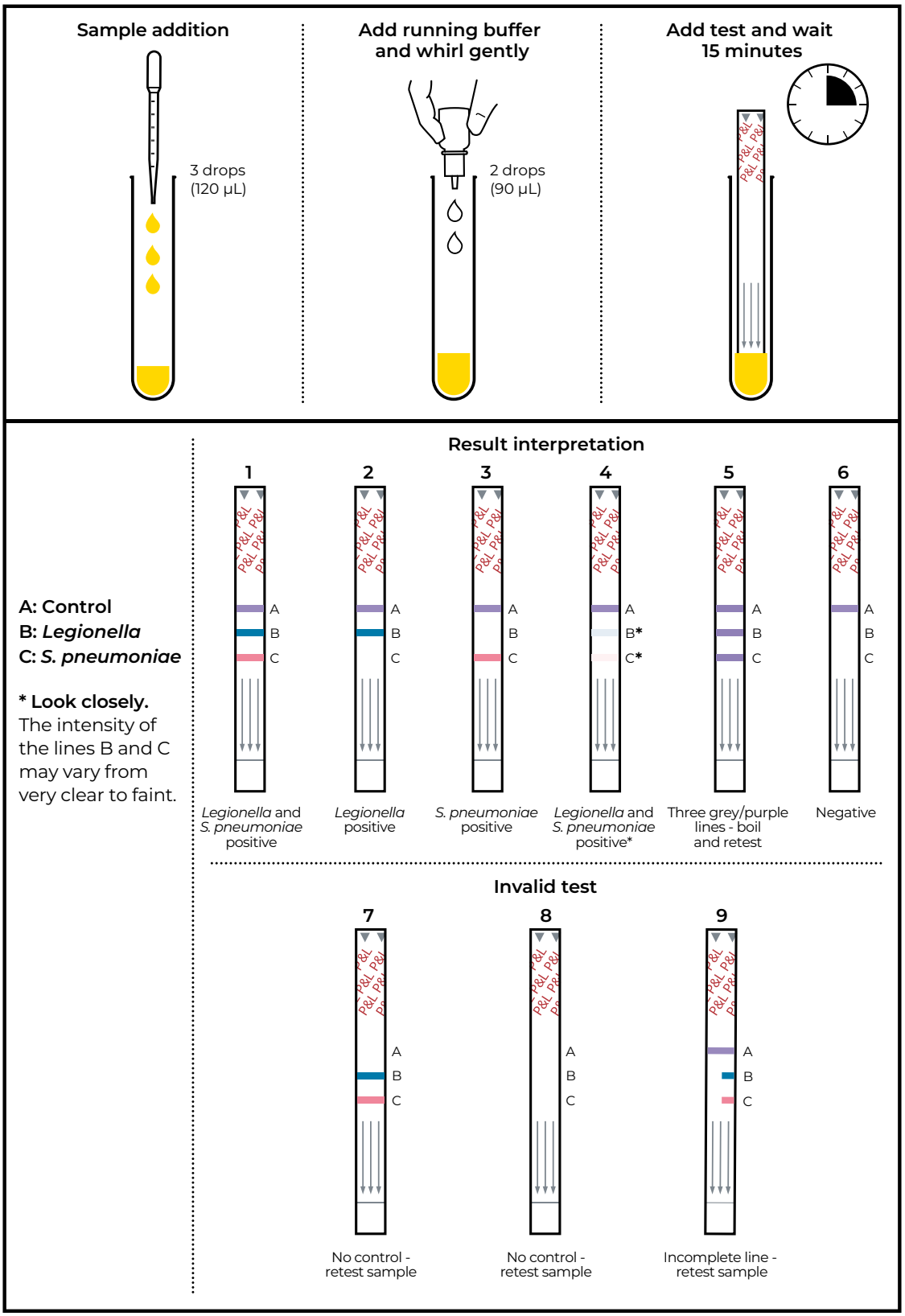
The positive and negative controls should follow the same procedure as if it was a urine or a CSF sample. The positive control should be visible at the control test line and both the *S. pneumoniae* and *L. pneumophila* test lines. The negative control should only be visible at the control line.

1. Bring the patient urine or CSF sample to room temperature.*
2. Apply a test tube in the cardboard holder.
3. Fill the transfer pipette with urine or CSF and add 3 drops (120 µL) of sample to the test tube (hold the pipette vertically).
4. Add 2 drops (90 µL) of running buffer to the test tube (hold the buffer bottle vertically).
5. Whirl the test tube gently.
6. Take the container with test, open it and take out the number of test strips needed, and close it firmly afterwards.
7. Insert the test strip into the test tube.
8. Wait 15 minutes.
9. Lift the test strip out of the test tube. Read the result within 5 minutes. **
10. Discard the test strip after interpretation of the result.

* If the urine sample contains visible blood, please confirm a positive result by boiling[1,2] the sample for 5 minutes and retest.

** Otherwise the test result may be inaccurate.

Quick guide


Sample addition
3 drops
(120 µL)
Add running buffer
and whirl gently
2 drops
(90 µL)
Add test and wait
15 minutes
A: Control
B: Legionella
C: S. pneumoniae
* Look closely.
The intensity of
the lines B and C
may vary from
very clear to faint.
Result interpretation
1
2
3
4
5
6
A
B
C
B*
C*
Legionella and
S. pneumoniae
positive
Legionella
positive
S. pneumoniae
positive
Legionella and
S. pneumoniae
positive*
Three grey/purple
lines - boil
and retest
Negative
Invalid test
7
8
9
No control -
retest sample
No control -
retest sample
Incomplete line -
retest sample

Interpretation of results

The control test line in the top will appear purple/grey but can also be more blue or red depending on whether the sample is positive for either *S. pneumoniae* or *L. pneumophila*.

If no control line is observed the test is **invalid** and the sample should be retested (see test results number 7 and 8, page 8).

A **positive sample for both *Legionella* and *S. pneumoniae*** will show a pink/red line in the bottom half of the test for *S. pneumoniae* positive followed by a blue line in the middle for *L. pneumophila* positive, and at the top of the test a purple/grey control line will appear (see test result number 1 and/or number 4, page 8).

A **positive sample for *Legionella*** will show a blue line for *L. pneumophila* positive, and at the top of the test a purple/grey control line will appear (see test result number 2, page 8). A positive result for *L. pneumophila* in CSF should be investigated further, if repeatedly positive for *Legionella*.

A **positive sample for *S. pneumoniae*** will show a pink/red line for *S. pneumoniae* positive, and at the top of the test a purple/grey control line will appear (see test result number 3, page 8).

Look closely. Even if there is a very faint line for either *Legionella* or *S. pneumoniae* or both, the test result is positive (see test result number 4, page 8). The enclosed “Scorecard” can help to determine if the test result is positive or negative.

A **negative sample** will show a single purple/grey control line in the top of the test (see test result number 6, page 8). A negative result does not exclude an *S. pneumoniae* or *Legionella* infection, see limitations.

Note: Three grey/purple test lines do not indicate a positive result (see test result number 5, page 8).

If three grey lines are observed the sample should be retested after boiling the urine sample for approximately five (5) minutes. Boiling can also be used for confirmation of a positive result as *Legionella* and *S. pneumoniae* antigens are heat stable. Remember to let the urine sample cool down to room temperature before retesting the sample.[1,2]

Limitations

- ImmuView *S. pneumoniae* and *L. pneumophila* Urinary Antigen Test has not been validated to be used with urine samples from children under 8 years.

- ImmuView *S. pneumoniae* and *L. pneumophila* Urinary Antigen Test has been validated using urine and CSF specimens only. Other specimens (e.g. serum, plasma or other body fluids) can cause false results and should **not** be tested.

- The sensitivity of ImmuView *S. pneumoniae* and *L. pneumophila* Urinary Antigen Test when testing CSF samples has been validated for *S. pneumoniae*.

- A negative result does not exclude the possibility of a *Legionella* infection, as it can be caused by other serogroups and *Legionella* species. There is no single satisfactory laboratory test for Legionnaires' Disease. Therefore, culture results, PCR, serology, and/or antigen detection methods should be used in conjunction with clinical findings to make an accurate diagnosis.

- A negative result does not exclude an *S. pneumoniae* infection. The result of this test as well as culture, serology, or other antigen detection methods should be used in conjunction with clinical findings to make an accurate diagnosis.

- *S. pneumoniae* vaccine may cause false positive results up to 10 days after vaccination.

- Administration of antibiotics might influence the test results for *S. pneumoniae*.

- The ImmuView *S. pneumoniae* and *L. pneumophila* Urinary Antigen Test is only validated for *S. pneumoniae* detection in CSF samples. A positive result for *L. pneumophila* in CSF should be investigated further if the CSF sample is repeatedly positive for *Legionella*.

- False results may occur from highly basic (pH≥9) urine and can cause false positive *S. pneumoniae* results. Water-based personal lubricant might result in false positive or grey *L. pneumophila* lines when found in the sample at high levels.

CLINICAL SENSITIVITY AND SPECIFICITY FOR URINE SAMPLES

(Retrospective study)

The clinical sensitivity of the *S. pneumoniae* test line was obtained by testing retrospective urine samples from patients with a blood culture positive sample for *S. pneumoniae*.

The clinical sensitivity of the *L. pneumophila* test line was obtained by testing retrospective urine samples from patients with a confirmed Legionnaires' disease according to the ECDC criterias.[3]

The clinical specificity of the *S. pneumoniae* and *L. pneumophila* test lines was obtained by testing urine samples from patients with urinary tract infections and blood culture negative samples.[3] Furthermore, no cross-reaction between *S. pneumoniae* and *L. pneumophila* serogroup 1 urine samples was detected. Sensitivity values were calculated using Wilson confidence interval 95%.

ImmuView®	Sensitivity
S. pneumoniae	85% (60/71 CI: 74-91%)
L. pneumophila	89% (88/99 CI: 81-94%)
Comparator	**Sensitivity**
S. pneumoniae	77% (55/71 CI: 66-86%)
L. pneumophila	72% (71/99 CI: 62-80%)

ImmuView®	Specificity
S. pneumoniae	99% (75/76 CI: 93-100%)
L. pneumophila	100% (76/76 CI: 95-100%)
Comparator	**Specificity**
S. pneumoniae	100% (76/76 CI: 95-100%)
L. pneumophila	100% (76/76 CI: 95-100%)

Positive agreement with other UAT

S. pneumoniae positive agreement was made in a sample population containing blood culture positive samples. *L. pneumophila* positive agreement was made in a sample population containing culture and/or PCR positive samples. The positive agreement was calculated in accordance with Wilson confidential 95%, by diving the number of positive ImmuView® samples with the number of positive samples by the comparator.

S. pneumoniae blood culture positive samples		Comparator		
		Positive	Negative	Total
ImmuView®	Positive	58	5	63
	Negative	2	11	13
Total		60	16	76
Positive agreement		97% (58/60 CL: 89-99%)		

L. pneumophila culture and/or PCR positive		Comparator		
		Positive	Negative	Total
ImmuView®	Positive	64	10	74
	Negative	1	8	9
Total		65	18	83
Positive agreement		98% (64/65 CL: 92-100%)		

Negative agreement with other UAT

S. pneumoniae negative agreement was made in a sample population containing non-pneumococcal cases (n = 90 bacteremic samples and n = 6 non-bacteremic). *L. pneumophila* negative agreement was made in a sample population prescreened with urinary antigen EIA. All samples included in the pool showed a negative result when using the comparator (urinary antigen EIA).

96 non-pneumococcal cases		Comparator		
		Positive	Negative	Total
ImmuView®	Positive	3	0	3
	Negative	0	93	93
Total		3	93	96
Negative agreement		100% (93/93 CL: 96-100%)		

Negative urinary antigen EIA directed at *L. pneumophila* sg. 1		Comparator		
		Positive	Negative	Total
ImmuView®	Positive	0	0	0
	Negative	0	456	456
Total		0	456	456
Negative agreement		100% (456/456 CL: 96-100%)		

ANALYTICAL STUDIES - URINE

Specificity (Cross-Reactivity)

To determine the analytical specificity of the ImmuView *S. pneumoniae* and *L. pneumophila* Urinary Antigen Test for cross-reactivity with urines spiked with whole cell bacteria and different inactivated viruses (N=143). The whole cell bacterial panel was tested in a 10^7 CFU/mL diluted from a stock solution. The viral panel had a concentration of 10^5 TCID50/mL. The panel was also tested in negative urine.

Organisms tested for interference	
Acinetobacter ssp.(4)	*Lactobacillus sp.*
Bacillus subtilist	*Listeria monocytogenes*
Bordetella pertussis	*Morganella morganii*
Moraxella catarrhalis	*Moraxella osloensis*
Candida albicans (4)	*Mycoplasma genitalium*
Citrobacter freundii	*Neisseria gonorrhoeae* (3)
Cornyebacterium sp.	*Neisseria lactamica*
Cornyebacterium uralyticum	*Neisseria meningitidis*
Enterobacter cloacae (3)	*Neisseria polysaccharea*
Escherichia coli (10)	*Proteus mirabilis* (2)
Enterococcus faecalis (7)	*Proteus vulgaris*
Enterococcus faecium	*Pseudomonas aeruginosa* (4)
Enterococcus durans	*Pseudomonas stutzeri*
Gardnerella vaginalis	*Pseudomonas spp.* (2)
Haemophilus Influenzae type a-f and non-caps (11)	*Salmonella bredeney*

Haemophilus parainfluenzae	*Salmonella Thompson*
Adenovirus 2,	*Salmonella typhimurium*
Clamydophila pneumoniae (2)	*Serratis marcescecns*
Chlamydia trachomatis	*Staphylococcus epidermidis*
Cytomegalovirus	*Salmonella glostrup*
Enterovirus D68	*Streptococcus mutans* (2)
Herpes Simplex 1,2	*Streptococcus parasanguis*
Influenza A (H1N1 and H3N2) virus	*Streptococcus sanguinis*
Influenza B Virus	*Streptococcus aureus* (6)
Parainfluenza virus 1,2,3 (3)	*Streptococcus epidermidis* (5)
Respiratory Syncytial Virus A	*Streptococcus saprophyticus* (3)
Klebsiella oxytoca (2)	*Stenotrophomonas maltophilia*
Klebsiella pneumoniae (3)	*Streptococcus* gr. A, B, C, F, L and G (16)
Lactobacillus catenaforme	*Streptococcus mitis*
Lactobacillus rhamnosus	

All of the above bacterial isolates were negative when using ImmuView *S. pneumoniae* and *L. pneumophila* Urinary Antigen Test. The only potential cross-reactivity was 1 of 3 isolates of *E. cloacea* which was positive for *L. pneumophila*. This was confirmed on re-testing of that one isolate.

A total of 19 urinary tract infections from patients were tested. Previous culture results had shown that eight (8) of them were infected with *Escherichia coli*, five (5) with *Staphylococcus aureus*, five (5) with *Streptococcus agalactiae* gr. B and one (1) with *Candida albicans.* None showed any cross reactions with the ImmuView test.

Sensitivity (Limit of detection (LOD))

The limit of detection (LOD) for the ImmuView *S. pneumoniae* and *L. pneumophila* Urinary Antigen Test is 62.5 pg/mL for purified *S. pneumoniae* CWPS antigen (native). For LPS specific for *L. pneumophila* SG1 (Philadelphia) the LOD is 25 ng/mL. Whole cell *S. pneumoniae* bacteria can be detected at 10^5 CFU/mL and *L. pneumophila* SG1 (Philadelphia) has a LOD at 10^4 CFU/mL. Boiling or urine preservatives did not change these results.

Strain	LOD
S. pneumoniae antigen	62.5 pg/mL
L. pneumophila SG 1 (Philadelphia) antigen	0.025 µg/mL
L. pneumophila SG 1 (Bellingham) antigen	0.5 µg/mL
S. pneumoniae (serotype 1)	10^5 CFU/mL
L. pneumophila SG1 (Philadelphia)	10^4 CFU/mL
L. pneumophila SG 1 (Bellingham)	10^5 CFU/mL

Strain Reactivity

Isolates from different *S. pneumoniae* serotypes were also positive tested with the ImmuView assay including serotype three (3), five (5), and thirty-seven (37). Different species of *L. pneumophila* were also found to be positive using the assay. Within serogroup one (1) these includes Philadelphia, Knoxville, OLDA/Oxford, Allentown/France, and Benidorm-Strain Lens. In addition, previous studies have found other *Legionella* serogroups to be positive such as serogroup three (3), six (6), and twelve (12).[4]

Streptococcus pneumoniae		
Subgroup	**Antigen (µg/mL)**	**Whole Organism (CFU/mL)**
Type 1	ND	10^4
Type 3	0.001	10^4
Type 5	0.010	10^5
Type 37	0.0001	ND

Legionella pneumophila serogroup one (1)			
Pontiac/Non-pontiac	**Species**	**Antigen (µg/mL)**	**Whole Cells (CFU/mL)**
Pontiac	Knoxville	0.100	10^5
Pontiac	Allentown/France	0.005	ND
Pontiac	Benidorm	ND	10^4
Pontiac	Philadelphia	0.010	10^4
Non-Pontiac	OLDA/Oxford	0.001	ND
Non-Pontiac	Camperdown	0.315	ND
Non-Pontiac	Heyman	1.250	ND

L. pneumophila Non-serogroup One (1) detected by ImmuView[4]
Serogroup; 2, 3, 4, 5, 6, 7, 11, 12, 13, 14, and 15

Interfering Substances

ImmuView *S. pneumoniae* and *L. pneumophila* Urinary Antigen Test was tested with forty-seven (47) interfering agents at different concentrations in urine samples.

Agent	Concentration
Acetaminophen	0.1mg/mL
Acetylsalicyclic acid	0.1mg/mL
Amantadine	0.03mg/mL
Amoxicillin	0.075mg/mL
Amphotericin B	0.22mg/mL
Antihistamine	0.22mg/mL
Ascorbic acid (C-Vitamin)	1mg/mL
Augmentin (Amoxicillin Clavulanate)	0.22mg/mL
Azithromycin	0.012mg/mL
Beet root	20%
Beet root	1.17%
Beet root	0.01%
Bilirubin	0.2mg/mL
Bromhexin/cough drops/couch syrup	0.22mg/mL
Caffeine	15mg/mL
Chlorophyll	0.11mg/mL
Chlorophyll	0.04mg/mL
Chlorophyll	0.01mg/mL
Ciprofloxacin	0.22mg/mL
Decongestant	0.22mg/mL
Corticosterone (Corticosteroids)	0.015mg/mL
Erythromycin	0.067mg/mL
Glucose (H)	20mg/mL
Glucose (M)	10mg/mL
Glucose (L)	3mg/mL
Hemoglobin	5mg/mL
Human albumin	35mg/mL
Human red blood cells 10% Washed pooled cells	10%
Ibuprofen	0.1mg/mL
Itraconazole	0.22mg/mL

Agent	Concentration
Leucocytes	>250 cells/µL
Miconazole	5%
Mix (pH, whole blood, protein and glucose) (H)	
Mix (pH, whole blood, protein and glucose) (M)	
Mix (pH, whole blood, protein and glucose) (L)	
Mucin	0.086mg/mL
Oseltamivir (Tamiflu)	0.03mg/mL
Oxalic acid	0.01%
pH (acidic)	4
pH (neutral)	7
pH (basic)	9
Plasma	90%
Plasma	50%
Plasma	10%
Prednisone	0.22mg/mL
Protein (albumin) (H)	10mg/mL
Protein (albumin) (M)	5mg/mL
Protein (albumin) (L)	0.6mg/mL
Pyridium	1mg/mL
Rifampicin	0.09mg/mL
Spinach	1%
Tobacco purified	0.4mg/mL
Triglycerides	4mg/mL
Urea	20mg/mL
Vaginal contraceptive gel	5%
Vancomycin	0.1mg/mL
Water-based personal lubricant	5%
White blood cells	10%
Whole blood	10%
Whole blood	15%

High concentration of plasma in urine may result in grey test lines. Additionally, basic (pH≥9) conditions in urine can give false positive *S. pneumoniae* lines. Water-based personal lubricant might result in false positive or grey *L. pneumophila* lines, however, this outcome seems dose-related.

Clinical Sensitivity and Specificity for CSF

The sensitivity of the *S. pneumoniae* test line was obtained by testing 12 CSF samples which were culture positive *S. pneumoniae* and 15 CSF samples spiked with *S. pneumoniae*. The specificity of the *S. pneumoniae* test line was obtained by testing 170 negative CSF samples from negative donors.

ImmuView®	Sensitivity	Specificity
S. pneumoniae	100% (27/27)	98.8% (168*/170)
L. pneumophila	N/A	100% (170/170)

* 2 samples were tested positive and confirmed positive with both another lateral flow test for *S. pneumoniae* and ImmuLex *S. pneumoniae* Omni. It was not possible to culture any bacteria from the samples, which can be caused by too many times of freezing and thawing of the sample.

The sensitivity of the *L. pneumophila* test line was not validated as only one case of *Legionella* meningitis has been reported. The specificity of the *L. pneumophila* test line was 100% (170/170).

Spiked CSF testing

Additional human CSF samples were spiked at the LOD with *S. pneumoniae* (N=50) and additional unspiked negative CSF samples (N=10) were tested with the ImmuView test and the comparator test. The sensitivity for both the ImmuView test and the comparator test was 50/50 (100%) and additional negative CSF samples used for blinding of the testing were negative in both the ImmuView test and the comparator test.

60 real human CSF samples			
ImmuView®	Comparator		Total
	Positive	Negative	
Positive	50	0	50
Negative	0	10	10
Total	50	10	60

ANALYTICAL STUDIES - CSF

Specificity (Cross-Reactivity)

ImmuView *S. pneumoniae* and *L. pneumophila* Urinary Antigen Test was tested with a panel of 24 potential cross-reacting agents. No cross-reactions were detected for the *S. pneumoniae* or the *L. pneumophila* test lines.

Organisms not affecting test performance in CSF	
E. coli (5)	*Neisseria meningitidis* Gr. B, D and W135 (3)
Haemophilus influenza type a-f and non-caps (7)	*Staphylococcus aureus*
Listeria monocytogenes	*Streptococcus* Gr A
Measles	*Streptococcus agalactiae* (GBS) sg Ia, Ib, II, III (4)
Streptococcus mitis	

Sensitivity (Limit of detection (LOD))

ImmuView *S. pneumoniae* and *L. pneumophila* analytical sensitivity was determined by limit of detection. Two different operators performed the dilutions and the testing. The dilutions were made with whole cell bacteria spiked in human CSF.

CSF	LOD
S. pneumoniae	10^3 CFU/mL

Interference agents

ImmuView *S. pneumoniae* and *L. pneumophila* Urinary Antigen Test was tested with forty-seven (47) interfering agents at different concentrations in artificial CSF either negative or spiked with either CWPS or *S. pneumoniae* 10^7 CFU/mL.

Agent in CSF	Concentration
Acetaminophen	
Glucose (H)	1mg/mL
Glucose (M)	0.5mg/mL
Glucose (L)	0.1mg/mL
Red blood cells (H)	15%
Red blood cells(M)	10%
Red blood cells (L)	5%
Protein (H)	60mg/mL
Protein (M)	30mg/mL
Protein (L)	10mg/mL
White blood cells	$10.6x10^6$/mL
White blood cells	$5.3x10^6$/mL
White blood cells	$2.7x10^6$/mL
White blood cells	$1.8x10^6$/mL
White blood cells	$0.9x10^6$/mL
Antigen	
Bilirubin	15%
Bilirubin	10%
Bilirubin	5%
Plasma	15%
Plasma	10%
Plasma	5%

Agent	Concentration
Negative Artificial CSF	
Glucose (H)	1mg/mL
Glucose (M)	0.5mg/mL
Glucose (L)	0.1mg/mL
Red blood cells (H)	15%
Red blood cells(M)	10%
Red blood cells (L)	5%
Protein (H)	60mg/mL
Protein (M)	30mg/mL
Protein (L)	10mg/mL
White blood cells	$10.6x10^6$/mL
White blood cells	$5.3x10^6$/mL
White blood cells	$2.7x10^6$/mL
White blood cells	$1.8x10^6$/mL
White blood cells	$0.9x10^6$/mL
Bilirubin	
Bilirubin	
Bilirubin	
Plasma	
Plasma	
Plasma	

Red blood cells may give false positive shadows on the *S. pneumoniae* line due to excessive red color. The other agents in the panel did not interfere with the test.

Reproducibility study

The ImmuView *S. pneumoniae* and *L. pneumophila* Urinary Antigen Test demonstrated excellent overall reproducibility with 1,068 correct results out of 1,072 test results (99.6%), when tested with 10 members of real positive *S. pneumoniae* or *L. pneumophila* urine samples and negative urine samples; and artificial CSF positive spiked with *S. pneumoniae* isolates as well as negative artificial CSF samples. The ImmuView Positive Control and Negative Control were also tested as blinded/masked panel members. The testing was performed for 5 days with a different kit lot at each site, two in the U.S. and one in Europe.

A total of 3 different lots were tested. Each site, using two operators (A and B) performed a total of 360 reproducibility tests and a grand total of 1,072 reproducibility results out of a total of 1,080 tests in the study using 6 operators. A total of 8 test results (0.7%) were determined to be invalid and were excluded and not re-tested. The panel members were blinded by changing of the panel member numbers and identity daily. The reading and interpretation of the reproducibility panels was performed visually. There were no statistical differences in reproducibility by lot, by site, by time or by operator.

Description	Correct results	Agreement
S. pneumoniae, moderate positive urine	90/90 Positive	100.0%
S. pneumoniae, moderate positive CFS	89/89[a] Positive	100.0%
S. pneumoniae, low positive spiked in artificial CFS	89/90[b] Positive	98.9%
S. pneumoniae, low positive urine	90/90 Positive	100.0%
L. pneumophila, moderate positive urine 2A	90/90 Positive	100.0%
L. pneumophila, moderate positive urine 2B	88/89[c] Positive	98.9%
L. pneumophila, low positive urine 1A	89/89[d] Positive	100.0%
L. pneumophila, low positive urine 1B	89/90[e] Positive	98,9%
Negative pooled urine	90/90 Negative	100.0%
Negative artificial CFS	90/90 Negative	100.0%
ImmuView positive control	89/90[f] Positive	98.9%
ImmuView negative control	85/85[g] Negative	100.0%
Summary	**1068/1072 Correct**	**99,6%**

a Operator did not see a positive control band, so one sample was invalid as the package insert states that this is necessary before interpreting the result. The sample was not re-tested.

b A visual *L. pneumophila* band was seen.

c Operator interpreted band as *S. pneumoniae* positive instead of *L. pneumophila* positive. One sample was invalid due to dot (incomplete band) on the strip per the package insert and was not re-tested.

d One sample was invalid due to an incomplete band in *S. pneumoniae* according to the package insert.

e No *L. pneumophila* band present.

f Operator interpreted *S. pneumoniae* band result as negative even though band was present.

g Five samples excluded due to the presence of dots and incomplete bands. The samples were not re-tested.

Quality Certificate

SSI Diagnostica's development, production and sales of *in vitro* diagnostics are quality assured and certified in accordance with ISO 13485.

95389

References

1. Rota MC, Fontana S, Montaño-Remacha C, et al.; Legionnaires' disease pseudoepidemic due to falsely positive urine antigen test results. J Clin Microbiol. 2014;52(6):2279-2280. doi:10.1128/JCM.00493-14.

2. Briones ML, Blanquer J, Ferrando D, Blasco ML, Gimeno C, Marín J.; Assessment of analysis of urinary pneumococcal antigen by immunochromatography for etiologic diagnosis of community-acquired pneumonia in adults. Clin Vaccine Immunol. 2006;13(10):1092-1097. doi:10.1128/CVI.00090-06.

3. Jørgensen CS, Uldum SA, Sørensen JF, Skovsted IC, Otte S, Elverdal PL; Evaluation of a new lateral flow test for detection of *Streptococcus pneumoniae* and *Legionella pneumophila* urinary antigen; Journal of Microbiological Methods; 2015.

4. Lindsay D, Scott KJ, Mcneill A, et al.; Evaluation of the rapid lateral flow ImmuView® urinary antigen test for the detection of *L . pneumophila* and *Streptococcus pneumoniae*. Poster at ESGLI 2017.

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