Uni-Gold™ C. difficile GDH

20 Tests
Store Kit at +2 to +30°C

REF **1206640**

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

Para outras línguas
Για τις άλλες λώσσες
För andra språk
For andre språk

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INTENDED USE

Trinity Biotech Uni-Gold™ C. difficile GDH is a single use rapid immunoassay for the qualitative detection of *Clostridium difficile* (*C. difficile*) GDH antigen in human stool specimens. This test is intended as an aid in the diagnosis of *Clostridium difficile* infections (CDI). As with other *C. difficile* tests, results should be considered in conjunction with clinical evaluation and medical history. For *In Vitro* Diagnostic Use.

SUMMARY AND EXPLANATION

C. difficile is part of the normal flora of the gastrointestinal tract. This anaerobic spore-forming bacterium opportunistically dominates when other competing gastrointestinal flora are impacted by the use of antibiotics.

C. difficile has become one of the most serious nosocomial pathogens, impacting hospitals (ICU, post-operative and cancer wards), nursing homes, and other medical institutions[1-2]. *C. difficile* spores aide the spread of the organism within hospitals and confer resistance to all cleaning agents and detergents except those containing bleach.

C. difficile causes diarrhoea, from the mild to the most severe form of antibiotic associated diarrhoea and pseudomembranous colitis (PC)[3]. PC is a severe inflammation of the colon which can be life-threatening, especially among the elderly. PC due to *C. difficile* infection is associated with toxigenic strains[3].

The clinical symptoms of PC are primarily associated with toxin A, the tissue-damaging enterotoxin[4-5]. *C. difficile* also produces toxin B, a cytotoxin. *C. difficile* strains produce either both toxins, toxin B or neither [6]. Detection of these antigens in stool samples is a reliable indicator of toxigenic strains (only these strains produce the toxin antigens).

C. difficile glutamate dehydrogenase (GDH) is a sensitive screening marker for the detection of the organism in faecal specimens [7-9]. This marker reliably detects both toxigenic and non-toxigenic strains.

PRINCIPLE OF THE TEST

Trinity Biotech Uni-Gold™ C. difficile GDH was designed as a rapid lateral flow immunoassay to detect the presence of GDH antigen in fresh and frozen human stool specimens.

The Uni-Gold™ C. difficile GDH rapid test consists of anti-GDH antibodies coated onto the test line region of the nitrocellulose zone of the test strip and anti-species specific antibodies coated onto the control line region. Anti-GDH antibodies are also conjugated to gold particles and dried onto inert glass fibre that is inserted into the test strip below the nitrocellulose zone.

GDH antigen present in the sample combines with the antibody/gold to form a complex. As this complex migrates up the nitrocellulose strip, it binds to the antibodies in the test region forming a visible dark red band.

Excess conjugate forms a second dark red band in the control region of the device. The control line should always appear as a visible dark red band in the control region of the device to indicate that the test device is functioning correctly.

REAGENTS

MATERIALS SUPPLIED

- 1206640-D — Test Devices: 20 devices, each containing a membrane striped with anti-GDH and anti-species specific antibodies, and pads with dried gold conjugated to anti-GDH antibodies.
- 1206640-B — *C. difficile* Dilution Buffer: 25 mL of buffered solution containing surfactants and preservatives.
- 90-1755 — Disposable transfer pipettes: 20 disposable single use pipettes, used to add sample to the test tube and transfer the sample/dilution buffer mix to the test device
- 99-8003 — Test tubes: 20 dilution tubes used for preparation of the sample/dilution buffer mix.
- Test tube holder — Cardboard tube holder
- Package insert

MATERIALS REQUIRED BUT NOT SUPPLIED

- Stool specimen collection container
- Timer or stopwatch
- Biohazard disposal container
- Disposable gloves
- Uni-Gold™ C. difficile GDH Controls (Cat.# 1206641)

OPTIONAL MATERIALS NOT PROVIDED:

- Specimen transport media

STORAGE AND STABILITY

- Store all components at 2-30˚C.
- Do not freeze or overheat.
- This product should not be used beyond the expiration date printed on the outer package label.
- The test kits should be kept away from direct sunlight, moisture and heat.

WARNINGS AND PRECAUTIONS

- For *In Vitro* Diagnostic Use only.
- For professional use only.
- Directions should be read and followed carefully.
- Test Devices are for single use only. Do not reuse.
- Do not use the test device if the pouch is opened or damaged.
- Reagents are provided at the necessary working strength. Do not dilute reagents.
- Do not interchange reagents between kits with different lot numbers.
- Do not use kits or reagents beyond the stated expiration dates.
- Microbial contamination of reagents may decrease the accuracy of the assay.
- 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.
- Dilution buffer solution contains ≤0.1% Proclin 300.
- Do not concentrate specimens before testing.
- Stool specimens preserved in fixatives are not suitable for use.

The safety data sheet is available upon request.

WARNING
Some components of this kit contain ≤ 0.1% ProClin 300®, a biocidal preservative that may cause sensitization by skin contact; prolonged or repeated exposure may cause allergic reaction in certain sensitive individuals.
H302: Harmful if swallowed.
H317: May cause an allergic skin reaction.
H335: May cause respiratory irritation.
P264: Wash thoroughly with plenty of soap and water after handling.
P270: Do not eat, drink or smoke when using this product.
P280: Wear protective gloves / protective clothing / eye protection / face protection.
P301+P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P302 + P352: IF ON SKIN: Wash with plenty of soap and water.
P330: If swallowed, rinse mouth.
P333 + P313: If skin irritation or rash occurs: Get medical advice/ attention.
P501: Dispose of contents and container in accordance to local, regional, national and international regulations.

SPECIMEN COLLECTIONS AND TRANSPORT

Human stool specimens collected for routine examination can be used with the Trinity Biotech Uni-Gold™ C. difficile GDH. Stool specimens should be collected in clean, leak-proof plastic containers.

- Fresh, untreated stool specimens should be stored at 2-8˚C and tested within 48 hours of collection
- If fresh untreated stool specimens will not be tested within 48 hours of collection, the sample should be stored at -20˚C or lower and tested within 1 month of collection. For longer term storage, please store the sample at -80˚C.
- Avoid multiple freeze-thaw cycles.
- Stool specimens preserved in fixatives are not suitable for use.

QUALITY CONTROL

Good Laboratory Practice (GLP) recommends the use of control specimens to ensure proper device performance at least once daily. Uni-Gold™ GDH Controls (Cat.# 1206641) are available separately for use only with the Uni-Gold™ C. difficile GDH. These controls are used to verify correct device performance, operator procedure and result interpretation. The positive control will produce a reactive test result and the negative control will produce a non-reactive test result (refer to the Interpretation of Results section).

It is recommended that positive and negative controls are run:

- By all new operators performing testing on patient specimens.
- With each new kit lot and whenever a new shipment of test kits is received.

- At periodic intervals as specified in the laboratory Quality Assurance program.

Uni-Gold™ C. difficile GDH Controls must give the expected reactive or non-reactive results. If the test results are not valid repeat the test with a new device. Refer to the Uni-Gold™ C. difficile GDH Controls package insert (1206641-29EN) for instructions on the use of these reagents. It is the responsibility of each laboratory using the Uni-Gold™ C. difficile GDH to establish an adequate quality assurance program to ensure the performance of the device under its specific locations and conditions of use. Contact Trinity Biotech should unexpected results occur.

Each Uni-Gold™ C. difficile GDH device has a built in procedural control that demonstrates assay validity. When a dark red line appears at the control line position this indicates the device has performed correctly. The control line will appear on all valid tests, whether or not the sample is reactive or non-reactive (refer to the Interpretation of Results section).

LIMITATIONS

- Uni-Gold™ C. difficile GDH must be used in accordance with the instructions in this package insert to obtain an accurate result.
- A negative test result does not exclude the possibility of the presence of *C. difficile* GDH. This may occur when the antigen level in the sample is below the detection level of the test. Correlation between the amount of antigen in a sample and clinical presentation has not been established.
- Uni-Gold™ C. difficile GDH detects GDH antigen in stool samples. The test cannot be used to derive a relationship between the intensity of the specific visible bands and the occurrence or severity of clinical symptoms.
- The results obtained are intended to aid in diagnosis only. All *in vitro* diagnostics tests must always be interpreted by the clinician in combination with the clinical evaluation, medical history, and/or other laboratory results to properly diagnose patients.
- Reading test results before or after the 15 minute read time may give incorrect results.
- Proper specimen collection and processing are essential to achieving optimal performance of the assay.
- Stool specimens preserved in fixatives are not suitable for use.
- GDH is a characteristic enzyme of *C. difficile* but does not distinguish between toxigenic and non-toxigenic bacteria. Other tests are needed to confirm the presence of toxigenic *C. difficile*.
- Cross reactivity was observed with *Clostridium botulinum* at a concentration of 10^7 cfu/mL. This may lead to false positive results.

TEST PROCEDURE

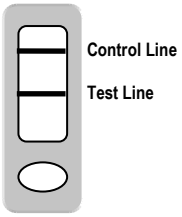
1. Ensure the *C. difficile* GDH Dilution Buffer is at room temperature (15-30˚C). Mix gently before use.
2. Sample preparation
   - Ensure all stool specimens are at room temperature (15-30˚C) prior to testing.
   - Mix samples thoroughly.
3. Fold test tube holder according to pictorial instructions printed on the cardboard.
4. Remove the required number of devices from their individual foil pouches and lay on a clean, flat surface.
5. Label each device with appropriate patient information.
6. Label test tubes and place in rack.
7. Add 1.0 mL *C. difficile* GDH Dilution Buffer to each tube using the 1.0 ml graduation on the dropper.
8. Sample addition
   - If the sample is liquid, use a disposable transfer pipette to transfer 100µL of sample (first graduation on transfer pipette) to the test tube. Holding the pipette vertically, add the entire contents of the pipette into the test tube.
   - If sample is solid, add a small amount of stool (approximately 4mm in diameter) into the test tube.
   - **NOTE:** Too much or too little specimen can lead to erroneous or invalid results.
9. Use the same transfer pipette to thoroughly mix the sample with the diluent by pipetting the sample up and down several times. Gentle vortexing can also be used to mix the sample.
10. Transfer 100µL of diluted sample (first graduation on the transfer pipette) to the device sample port. Holding the pipette vertically over the device sample port; carefully add the buffered-sample drop-wise. Time the assay from this point.
11. Read assay results immediately at the end of the 15 minute incubation. Do not read results after 15 minutes as they may be inaccurate.

INTERPRETATION OF RESULTS

- **Positive Result:**

  Two dark red lines of any intensity appear in the device window; at the test line and control line positions. This indicates a reactive result that is interpreted as positive for GDH.

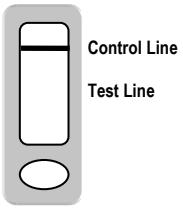
Positive Image



- **Negative Result:**

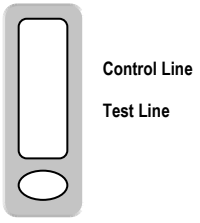
  A single dark red line of any intensity appears in the device window at the control line position. There is no line at the test line position. This indicates a non-reactive result that is interpreted as negative for GDH.

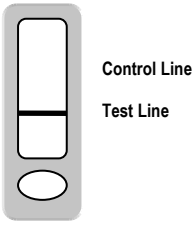
Negative Image



- **Invalid Result:**

  No line appears in the device window at the control line position. This is an invalid result and cannot be interpreted. This is irrespective of whether or not a dark red line appears in the device window at the test line position. If either condition below occurs, the test should be repeated with a new device.





PERFORMANCE CHARACTERISTICS

The performance of Uni-Gold™ C. difficile GDH was evaluated on 287 retrospective stool samples at a clinical laboratory and an in-house site.

Clinical Sensitivity & Specificity

Retrospective Study
The sensitivity and specificity of the test was compared against a commercially available EIA test with retrospective samples as shown in the following table.

Uni-Gold™ C. difficile GDH		*C. difficile* GDH EIA	
		(+) Positive	(-) Negative
Uni-Gold™	(+) Positive	146	19
	(-) Negative	5	117
	Total	151	136

Sensitivity: 97% (146/151) 95%CI 92.0– 98.7%
Specificity: 86% (117/136) 95%CI 78.8 – 91.2%

Concordance Study
Uni-Gold™ C. difficile GDH was compared to a commercially available lateral flow test on 287 retrospective stool samples. The percent agreement of Uni-Gold™ C. difficile GDH versus the commercially available comparator device was as follows:

Uni-Gold™ C. difficile GDH		Comparator Device	
		(+) Positive	(-) Negative
Uni-Gold™	(+) Positive	144	21
	(-) Negative	5	117
	Total	149	138

Overall Agreement: 91%

Expected Values
The performance of the Uni-Gold™ C. difficile GDH Test Kit was evaluated at internal and external laboratories. Samples were collected from Hospitals throughout the US and consisted of both male and female patients, of all ages from pediatric to adult, who were suspected *Clostridium difficile* infections (CDI). The retrospective study included 151 positive samples and 136 negative samples

confirmed by EIA. There were no differences observed in clinical performance between males or females, or between pediatric or adult populations.

Analytical Sensitivity
The limit of detection was determined by spiking recombinant *Clostridium difficile* GDH into buffer diluent. The samples were serially diluted and were tested with the Uni-Gold™ C. difficile GDH to determine the lowest concentration that produced a positive result. A limit of detection of 1.58ng/mL was determined for Uni-Gold™ C. difficile GDH.

Cross Reactivity
No cross-reactivity was observed with negative samples containing the following organisms at a concentration of 10^7 cfu/mL:

Aeromonas hydrophila	*Enterococcus faecalis*	*Helicobacter pylori*
Bacillus cereus	*Escherichia coli O157:H7*	*Shigella disentraie*
Bacillus fragilis	*Escherichia coli*	*Staphylococcus aureus*
Campylobacter jejuni	*Escherichia coli ETEC*	*Vibrio cholerae*
Candida albicans	*Escherichia coli EIEC*	*Yersinia enterocolitica*
Clostridium perfringens	*Salmonella typhimurium*	

Cross reactivity was observed with *Clostridium botulinum* at a concentration of 10^7 cfu/mL.

Interfering Substances
The analytical specificity of the test was determined in stool samples containing potentially interfering substances at clinically relevant concentrations. Compounds were respectively spiked into positive and negative samples at medically relevant dosages (treatment). All treatments, including the unspiked (neat) positive and unspiked (neat) negative samples were tested across multiple samples with Uni-Gold™ C. difficile GDH. The following compounds were tested:

Human blood (20%)	Loperamide (4%)
SMECTA® (5%) (Diosmectite)	

No test interference was observed by any of the compounds at the concentrations tested above.

Reproducibility Study
Reproducibility testing was carried out in duplicate on five blinded samples (varying positive and negative samples) by two operators, twice daily for three days. 100% of the samples tested for *C. difficile* produced the expected results.

REFERENCES

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ORDERING INFORMATION

Cat. No.	Item	Quantity
1206640	Uni-Gold™ C. difficile GDH	20 devices
1206641	Uni-Gold™ C. difficile GDH Control Kit	1 positive & 1 negative

GUIDE TO SYMBOLS


Consult Instructions for Use

Product Number

Lot Number

In Vitro Diagnostic Medical


Use By


Caution, consult accompanying documents


Temperature limitation


Manufacturer

WARNING

EC REP Trinity Biotech plc.
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