Instructions for Use

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OC-Light™ S FIT

Test Strips REF **V-PC52**
Sampling Bottles REF **V-PH82**

INTENDED USE

OC-Light™ S FIT (Faecal Immunochemical Test, also known as iFOBT, immunochemical faecal occult blood test) is an in vitro manual immunochemical test intended for the qualitative detection of human haemoglobin in faeces. OC-Light™ S FIT aids in the diagnosis of colorectal cancer, neoplasia, dysplasia, polyps, and other disorders associated with gastrointestinal bleeding in conjunction with other clinical findings. The test can be utilized in colorectal cancer screening for asymptomatic population as well as in diagnostic aid and monitoring for symptomatic patients. The test is noninvasive, using stool/faeces as test sample. The test is used by qualified personnel in clinical laboratories and hospitals.

SUMMARY

The presence of faecal occult blood is associated with gastrointestinal disorders. Detection of haemoglobin in faeces is an effective means of screening for early diagnosis and treatment of colorectal cancer and other lower digestive tract illnesses that are accompanied by haemorrhaging.[1-6] Conventional manual test methods used for the detection of faecal occult blood do not provide a high degree of accuracy. Immunochemical tests developed to detect human haemoglobin (hHb) are more accurate and do not require special dietary restrictions.[7]

PRINCIPLE OF THE METHOD

OC-Light™ S FIT is an *in vitro* diagnostic device, a qualitative test designed for the immunochemical detection of hHb in stool specimens. When the sample end of the Test Strip is dipped in the faecal extract, the liquid faecal extract wicks through a series of absorbent materials and contacts colloidal gold conjugated with monoclonal antibodies specific to hHb. If hHb is present in the sample, it reacts with the antibodies on the colloidal gold. When the gold conjugate with hHb reaches the test region of the membrane, it binds with the immobilised antibodies also specific to hHb to form a visible reddish/pink line. The procedural control region of the membrane contains immobilised anti-mouse antibodies that capture the conjugate independent of the presence of the hHb, thereby always producing a distinct reddish/pink line. The reddish/pink line in the procedural control region demonstrates the validity of the test and assures the operator that the device is working properly.

MATERIALS PROVIDED

Product code	Product name	Contents	Storage
V-PC52	OC-Light™ S FIT Test Strips	10 x 50 strips	2-30 ºC
V-PH82	OC-Light™ S FIT Sampling Bottles	20 x 50 bottles	2-30 ºC

OC-Light™ S FIT Test Strips ----------10 x 50 strips/bottle
Test Strip contains monoclonal anti-hHb antibodies conjugated colloidal gold and immobilised anti-mouse antibodies and immobilised anti-hHb antibodies.
Store Test Strips at 2-30 ºC in their original canister. DO NOT FREEZE. Test Strips are stable until the expiration date printed on the label.

OC-Light™ S FIT Sampling Bottles ---------- 20 x 50 bottles
Sampling Bottle contains 2 mL of buffer solution, containing 50 mM HEPES buffer and <0.1% sodium azide. It is stable until the expiration date printed on the label when stored at 2-30 ºC.

MATERIALS REQUIRED BUT NOT PROVIDED

- Timing device
- Gloves
- External Control

WARNINGS AND PRECAUTIONS

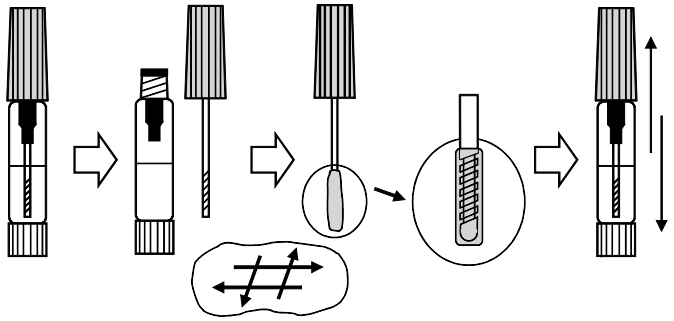
- For *in vitro* diagnostic use only.
- For professional and laboratory use.
- The directions for use must be followed carefully for accurate results.
- Do not reuse Test Strips and Sampling Bottles.
- Do not use Test Strips if canister is damaged or does not seal.
- Do not touch the reagent area of Test Strip or disassemble.
- In case of contact with collection buffer to eye, mouth, or skin, wash thoroughly with plenty of water and see a doctor for proper treatment if necessary.
- Treat the sample dissolved solution (faecal extraction) and used Test Strips as if they are potentially infectious.
- Wear disposable gloves when performing the test to avoid infection.
- In case of sample spill, bleach is recommended for cleaning and disinfecting.
- Do not use beyond the labelled expiration date. The expiration date can be found on the carton and bottle labels of the Test Strips and the bag and bottle labels of the Sampling Bottles.
- Do not use sampling probe directly on a human body.
- Dispose of used Sampling Bottles and Test Strips in accordance with local requirements.

SPECIMEN COLLECTION

1. Open green cap by turning to the left and pulling upwards.
2. Collect faecal sample by scraping surface of stool widely with the sample probe. Cover the grooved portion of the sample probe completely with stool sample.
3. Close Sampling Bottle by inserting the sample probe and screwing the cap tightly to the right. Shake the Sampling Bottle.
   DO NOT REOPEN.
4. Fill in all required information and place in a transport bag and send/bring to laboratory immediately for assay.

Note:

- No special dietary restrictions are necessary.
- The faecal samples collected in the OC-Light™ S FIT Sampling Bottles may be stored at room temperature for up to 15 days or at 2-8 ºC for up to 30 days. DO NOT FREEZE.



TEST PROCEDURE

1. Bring Test Strips and Sampling Bottle containing patient's faecal sample to 20-30 ºC. Shake the Sampling Bottle vigorously.
2. Remove an OC-Light™ S FIT Test Strip from the canister. Minimize the amount of time that the canister is left open and ensure that the canister is securely closed after opening.
3. Remove the white cap on the Sampling Bottle. Drop the sample end of the Test Strip into the Sampling Bottle.
4. Start a timer.
5. When the timer reaches 5 minutes, read results. Read results as shown under "INTERPRETATIN OF RESULTS".

INTERPRETATION OF RESULTS

POSITIVE

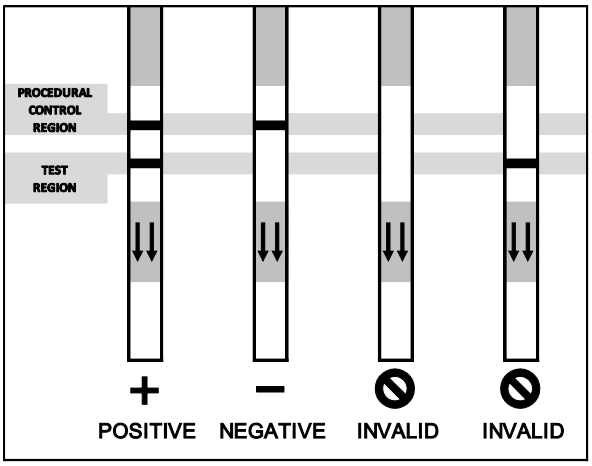
Carefully look for the appearance of a test line in the Test Region. ANY reddish/pink coloured line in the Test Region with a coloured line in the Procedural Control Region is a positive result. Neither the intensity nor the colour should be compared to that of the Procedural Control line.

NEGATIVE

If no reddish/pink line appears in the Test Region and one line in the Procedural Control Region, the result is negative.

INVALID

If no reddish/pink line appears in the Procedural Control Region, the test is invalid and must be repeated with a new Test Strip.



QUALITY CONTROL

Good laboratory practices recommend the use of appropriate controls to ensure the proper performance of the test.

Procedural Control

The Procedural Control is found in the Procedural Control Region of the Test Strip. This control assures the operator that (A) sample addition and migration through the Test Strip has occurred and that (B) the control anti-mouse antibody and the reporter MAb are intact and functional. This control does not ensure that the capture antibody is accurately detecting the presence or absence of hHb in the sample.

External Control

External controls are used to assure the operator that the capture and conjugated antibodies are present and reactive. External controls will not detect an error in performing the patient test procedure. Controls should be assayed once per bottle of Test Strips. To use, unscrew the white cap on the Sampling Bottle. Add commercially available control with known hHb concentration. Replace the white cap and shake vigorously. Follow step three to five of the test procedure. If controls do not perform as expected, do not use the test results, and repeat the test.

The buffer in Sampling Bottle may be used as a negative control.

LIMITATIONS

- OC-Light™ S FIT is intended only for the detection of hHb in faeces. It is not advised for use in patients suspected of upper GI bleeding.
- Patients with the following conditions should not be considered for testing as these conditions may interfere with the test results:
  - Bleeding haemorrhoids
  - Constipation bleeding
  - Urinary bleeding
  - Menstrual bleeding
- Certain medications such as aspirin and non-steroidal anti-inflammatory drugs may cause gastrointestinal irritation and subsequent bleeding in some patients and cause positive results.
- As with any occult blood test, results obtained with OC-Light™ S FIT should not be considered conclusive evidence of the presence or absence of GI bleeding or pathology. The OC-Light™ S FIT is designed for preliminary screening. It is not intended to replace other diagnostic procedures such as colonoscopy or sigmoidoscopy in combination with double contrast barium x-ray.
- Because gastrointestinal lesions may bleed intermittently and blood in faeces is not distributed uniformly, a negative test result does not assure absence of lesion.
- Use of stool samples that are not collected in a Sampling Bottle (REF V-PH82) following bowel movement may affect the result due to instability of haemoglobin in stool.
- Urine and excessive dilution of samples with water from the toilet bowl may cause erroneous test results.
- OC-Light™ S FIT is not for use in testing urine, gastric specimens, or other body fluids.
- OC-Light™ S FIT has not been validated for testing of patients with all existing haemoglobinopathies. Clinical consideration is recommended.

EXPECTED RESULTS

Positive rates with immunochemical faecal occult blood tests have been shown to vary in each patient population depending on the test used, age and ethnicity of the patient and the predisposition to colorectal disease and other factors that may be associated with lower gastrointestinal bleeding.[8-10] The OC-Light™ S FIT detects Hb in faeces at levels as low as 50 ng/mL buffer or 10 µg/g stool.

PERFORMANCE CHARACTERISTICS

Clinical Cut-off

10 µg hHb/g stool, or 50 ng hHb/mL buffer

The ability of OC-Light™ S FIT to detect hHb variants was determined by testing HbS and HbC, in comparison to a reference, HbA0. OC-Light™ S FIT detected the presence of these variants, HbA0, HbS and HbC.

Reproducibility

Reproducibility studies were conducted at three laboratories, using hHb spiked stool samples, 7 levels of hHb concentrations ranging from 0 to 2000 ng/mL (400 µg/g stool). Total of nine operators participated in the study for over twenty days of testing, utilizing three lots of Test Strips and Sampling Bottles. The results were compared against the expected. Repeatability, between lot, between run, between site reproducibility are analysed, and each were satisfactory. When combined, overall percent agreement was 98.9% (95%CI 98.3-99.3%), positive percent agreement was 99.8% (95%CI 99.4-100%), and negative percent agreement was 97.1% (95%CI 95.5-98.3%).

Sample Stability

Sample stability studies were conducted in house. Human haemoglobin-free stool was spiked with a known level of human haemoglobin to result in the following concentrations: 0, 5, 8, 10, 12, 15, and 400 µg/g stool that are equivalent to 0, 25, 40, 50, 60, 75 and 2000 ng/mL sampling buffer. The samples in Sampling Bottles are stored at 15, 25, and 30 °C for 15 days, and at 2, 4, and 8 °C for 30 days. Overall percent agreements against expected results were favourable at all the temperatures tested.

(1) Stored at room temperature for 15 days

Day 15	Actual Results	Expected Results			Overall Percent Agreement
	OC-Light S FIT	Positive Results	Negative Results	Total Results	
15ºC	Positive Results	284	3	287	99.3%
	Negative Results	0	154	154	
	Total Results	284	157	441	
25ºC	Positive Results	284	2	286	99.5%
	Negative Results	0	155	155	
	Total Results	284	157	441	
30ºC	Positive Results	283	0	283	99.8%
	Negative Results	1	157	158	
	Total Results	284	157	441	

(2) Stored in refrigerator for 30 days

Day 30	Actual Results	Expected Results			Overall Percent Agreement
	OC-Light S FIT	Positive Results	Negative Results	Total Results	
2ºC	Positive Results	283	6	289	98.4%
	Negative Results	1	151	152	
	Total Results	284	157	441	
4ºC	Positive Results	284	4	288	99.1%
	Negative Results	0	153	153	
	Total Results	284	157	441	
8ºC	Positive Results	280	0	280	99.1%
	Negative Results	4	157	161	
	Total Results	284	157	441	

Interference Testing

Cross-reactivity studies were performed by adding the following non-human haemoglobin (Hb) and tissue extracts as samples. Hb from bovine, equine, goat, porcine, rabbit, sheep, turkey, and fish was added to normal stool extracts containing 0 and 50 ng/mL hHb. All tests with 0 ng/mL hHb with non-human Hb were negative, indicating no cross-reactivity, and all with 50 ng/mL hHb were positive, indicating no interference to the test. The same test was performed with addition of tissue extracts from beef, chicken, fish, horse, pork, rabbit, goat, and sheep, resulting in no cross-reactivity or interference to the test.

Dietary Testing

A potential interference of dietary substances on the OC-Light™ S FIT was assessed. Aqueous extracts of raw broccoli, cauliflower, cantaloupe, horseradish, red radish, parsnip, and turnip were added to the test device to determine if vegetable extracts cross react with the test. The extracts were prepared by homogenizing raw vegetable in a food processor and then subsequently centrifuging the extract to separate the solid and liquid phases. Dietary Iron and Vitamin C supplements were also tested for cross-reactivity. No cross-reactivity was evident.

Comparison Study

OC-Light™ S FIT was compared with a previous generation device, OC-LIGHT. The study was performed at total of six laboratories (three physician office laboratories and three professional medical laboratories) with 953 specimens. The overall percent agreement between OC-Light™ S FIT and OC-LIGHT was 99.9% with positive percent agreement of 100% and negative percent agreement of 99.9%, demonstrating that the analytical performance of the two devices is substantially equivalent.

OC-Light S FIT	OC-LIGHT			Overall Percent Agreement (95% CI)	Positive Percent Agreement (95% CI)	Negative Percent Agreement (95% CI)
	Positive Results	Negative Results	Total Results			
Positive Results	121	1	122	99.9% (99.4%-100%)	100% (97.0%-100%)	99.9% (99.3%-100%)
Negative Results	0	831	831			
Total Results	121	832	953			

OC-Light™ S FIT was compared with OC-SENSOR FIT, measured with an automated analyser, with 160 specimens with a cut-off set at 50 ng/mL (10 µg/g stool). The overall percent agreement was 96.9% with positive percent agreement of 96.0% and negative percent agreement of 98.3%.

OC-Light S FIT	OC-SENSOR FIT			Overall Percent Agreement (95% CI)	Positive Percent Agreement (95% CI)	Negative Percent Agreement (95% CI)
	Positive Results	Negative Results	Total Results			
Positive Results	97	1	98	96.9% (92.9%-98.7%)	96.0% (90.3%-98.5%)	98.3% (91.0%-99.7%)
Negative Results	4	58	62			
Total Results	101	59	160			

Clinical Performance

Clinical sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of OC-LIGHT by two studies are shown as references. Due to limitation of published study using OC-Light™ S FIT with sufficient sample size, studies with OC-LIGHT were cited as equivalence of the two tests were verified in the comparison study.

1) In asymptomatic population in screening reported by Chiu et al.[11]
N=18,296

	Sensitivity	Specificity	PPV	NPV
CRC	78.6%	92.8%	1.65%	99.9%
Advanced neoplasia	30.2%	93.6%	15.0%	97.3%
Advanced adenoma	28.0%	93.5%	13.3%	97.3%

2) In symptomatic population reported by Kaul et al.[12]
N=112

	Sensitivity	Specificity	PPV	NPV
CRC	100%	86.3%	56.6%	100%

REFERENCES

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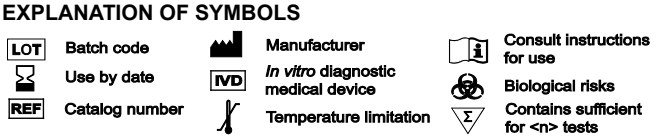
11. Chiu HM, Lee YC, Tu CH, et al. Association between early stage colon neoplasms and false-negative results from the fecal immunochemical test. *Clin Gastroenterol Hepatol.* 2013;11(7):832-8.e82.
12. Kaul A, Shah A, Magill FH, Hawkins SA, Skaife P. Immunological faecal occult blood testing: a discriminatory test to identify colorectal cancer in symptomatic patients. *Int J Surg.* 2013;11(4):329-331.

NOTICE

In case of occurrence of any serious incident that has occurred in relation to the device shall be reported to the authorised representative, the manufacturer, and the competent authority of the Member State in which the user and/or the patient is established.

EXPLANATION OF SYMBOLS



IVD CE 0123

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Date of issuance: 2022-05-26
341760A-C