



ONE STEP TEST FOR HBsAg

DIPSTICK

INTRODUCTION

VIRUCHECK® one step test for HBsAg is a rapid, qualitative, two site sandwich immunoassay for the detection of Hepatitis B surface antigen, a marker for Hepatitis B infections, in serum/plasma specimen. For professional use.

SUMMARY

Blood containing the Hepatitis B Virus (HBV) is potentially infectious. Hepatitis B surface Antigen (HBsAg), earlier known as Australia antigen, is among the first serological markers that circulate in the blood of infected persons even two to three weeks prior to the appearance of clinical symptoms. The levels of HBsAg are especially elevated during the symptomatic phase and decline thereafter.

Detection of HBV using HBsAg as the marker to screen blood donors is essential to reduce the risk of transmission of Hepatitis B by blood transfusion. HBsAg detection is also useful for screening high risk groups for HBV and for differential diagnosis of Hepatitis infection.

VIRUCHECK® one step test for HBsAg detects the presence of HBsAg in serum/plasma specimens, qualitatively, at concentrations as low as 0.5 ng/ml.

PRINCIPLE

VIRUCHECK® one step test for HBsAg utilizes the principle of agglutination of antibodies/ antisera with respective antigen in immuno-chromatography format along with use of nano gold particles as agglutination revealing agent. As the test sample flows through the membrane assembly within the test dipstick, the colored Agglutinating sera for HBsAg-colloidal gold conjugate complexes with the HBsAg in the sample. This complex moves further on the membrane to the test region where it is immobilized by the Agglutinating sera for HBsAg coated on the membrane leading to formation of a colored band which confirms a positive test result. Absence of this colored band in the test region indicates a negative test result. The unreacted conjugate and unbound complex if any move further on the membrane and are subsequently immobilized by the Agglutinating sera for rabbit globulin coated on the membrane at the control region, forming a colored band. This control band serves to validate the test results. The control band formation is based on the 'Rabbit globulin / Agglutinating Sera for Rabbit globulin' system. Since it is completely independent of the analyte detection system, it facilitates formation of consistent control band signal independent of the analyte concentration. This control band serves to validate the test performance.

REAGENTS AND MATERIALS SUPPLIED

Each individual pouch contains:

1. **DIPSTICK**: Contains membrane assembly predispensed with Agglutinating sera for HBsAg -colloidal gold conjugate, rabbit globulin-colloidal gold conjugate, Agglutinating sera for HBsAg and Agglutinating sera for rabbit globulin at the respective regions.
2. Desiccant pouch.

REF	302020001	302020010	302020025	302020050	302020100
	1	10	25	50	100

STORAGE AND STABILITY

The sealed pouches in the test kit may be stored between 4°C To 30°C till the duration of the shelf life as indicated on the pouch. DO NOT FREEZE.

NOTE

1. For in vitro diagnostic use only. NOT FOR MEDICINAL USE.
2. Do not use beyond expiry date.
3. Read the instruction carefully before performing the test.
4. Handle all specimens as potentially infectious.
5. Follow standard biosafety guidelines for handling and disposal of potentially infective material.
6. Contact with the contents of desiccant pouch containing, among other substances, cobalt chloride (CAS# 7646-79-9) should be kept to a minimum. Inhalation / swallowing may cause harm.

SPECIMEN COLLECTION AND PREPARATION

No special preparation of the patient is necessary prior to specimen collection by approved techniques. Though fresh serum/plasma is preferable, serum/plasma specimen may be stored 2°C To 8°C for upto 24 hours, in case of delay in testing. Do not use haemolysed, turbid or contaminated samples. Turbid samples should be centrifuged and clear supernatant must be used for testing.

TESTING PROCEDURE AND INTERPRETATION OF RESULTS

1. Collect serum/plasma specimen in a clean test tube. Ensure that only sufficient quantity of the specimen is collected to allow submerging the red area of the dipstick (about 1 cm high).
2. Bring the sealed pouch to room temperature, open the pouch and remove the dipstick (taking care not to touch the membrane area), and desiccant pouch. Check the color of the desiccant. It should be blue, if it has turned colorless or pink, discard the dipstick and use another dipstick. **Once opened, the dipstick must be used immediately.**
3. Dip the dipstick in the serum/plasma specimen **submerging only the red area.**
4. At the end of fifteen minutes read the results as follows:



NEGATIVE : A colored band appears on the dipstick.



POSITIVE: Two distinct colored bands appear on the dipstick.



INVALID: The test should be considered invalid if no colored band appears on the dipstick. The test should also be considered invalid if a colored band appears only at the test region and not at the control region. In such cases, repeat the test with a new dipstick ensuring that the test procedure has been followed accurately.



5. Although, depending on the concentration of HBsAg in the specimen, positive results may start appearing as early as 2 minutes, negative results must be confirmed only at the end of fifteen minutes.
6. In case of a doubtful result at 15 minutes, the test may be extended upto 30 minutes to get a clear background.

PERFORMANCE CHARACTERISTICS

Internal Evaluation-I

In an in-house study, the performance of **VIRUCHECK**[®] dipstick was evaluated using a panel of fifty known positives (of varying reactivity) and two hundred known negative specimens in comparison to two licensed ELISA kits - ELISA-I & ELISA-II. The results of the evaluation are as follows:

SPECIMEN DATA	TOTAL	VIRUCHECK [®]	ELISA-I	ELISA-II
Number of specimens tested	250	250	250	250
Number of Positives	50	50	50	50
Number of Negatives	200	200	200	200

Based on this evaluation:

Sensitivity of **VIRUCHECK**[®]: 100%

Specificity of **VIRUCHECK**[®]: 100%

Internal Evaluation-II

VIRUCHECK[®] was evaluated with a serial dilution of known concentration of HBsAg positive sample. It was observed that **VIRUCHECK**[®] was able to detect all the dilutions with HBsAg concentration of ≥ 0.5 ng/ml.

Therefore the detection limit of **VIRUCHECK**[®] is 0.5 ng/ml.

With a low titre performance panel (PHA 104) from BOSTON BIOMEDICA Inc., USA, **VIRUCHECK**[®] showed (±) reactivity with a sample that contained as low as 0.3 ng/ml of HBsAg. In the same panel, with another sample of 0.6 ng/ml, **VIRUCHECK**[®] showed (+) reactivity.

Independent External Evaluation

In another independent study, the performance of **VIRUCHECK**[®] was evaluated using a panel of 50 samples - 20 positives & 30 negatives, in comparison with commercially available Immunochromatographic Test (ICT) and Enzyme Immunoassay (EIA). The results of the evaluation are as follows:

SPECIMEN DATA	TOTAL	VIRUCHECK [®]	ICT	EIA
Number of specimens tested	50	50	50	50
Number of Positives	20	19	18	20
Number of Negatives	30	31	32	30

The above study indicates good correlation of the results of **VIRUCHECK**[®] with that of EIA.

LIMITATIONS OF THE TEST

1. Though **VIRUCHECK**[®] is a reliable screening assay, it should not be used as a sole criterion for diagnosis of HBV infection.
2. Interference due to heterophile antibodies, Rheumatoid Factors and other nonanalyte substances in patient's serum, capable of binding antibodies multivalently and providing erroneous analyte detection in immunoassays, has been reported in various studies. Though **VIRUCHECK**[®] uses sufficient amounts of HETEROPHILIC BLOCKING REAGENT (HBR) to inhibit the majority of this interference; nevertheless, some samples with high titers may still express clinically important assay interference. Both laboratory professionals and clinicians must be vigilant to this possibility of antibody interference. Results that appear to be internally inconsistent or incompatible with the clinical presentation should invoke suspicion of the presence of an endogenous artifact and lead to appropriate in vitro investigative action.
3. Do not compare the intensity of test lines and the control lines to judge the concentration of HBsAg in the test specimen.
4. Since various tests of HBsAg differ in their performance characteristics and antibody composition, their reactivity patterns may differ.
5. Testing of pooled samples is not recommended.
6. Most positive results develop within 15 minutes. However, certain sera sample may take a longer time to flow. Therefore, negatives should be confirmed only at 30 minutes. Do not read results after 30 minutes.
7. HBsAg is coded for by the S gene, and the common antigenic epitopes of all subtypes of HBsAg are found in the same 'a' determinant. The antibodies used in **VIRUCHECK**[®] are directed against this 'a' determinant so that all subtypes of HBsAg can be detected. However, a few patients infected with HBV may show negative for HBsAg inspite of a positive test for HBV-DNA or HBV polymerase chain reaction. These rare cases are due to antigenically divergent variants. Therefore, the existence of such variants should be considered before taking clinical decisions.
8. As with all diagnostic tests, a definitive clinical diagnosis should not be based on the result of a single test, but should only be made by the physician after all clinical and laboratory findings have been evaluated.













WARRANTY

This product is designed to perform as described on the label and package insert. The manufacturer disclaims any implied warranty of use and sale for any other purpose.

BIBLIOGRAPHY

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2. Kee Myung Lee et al., Emergence of Vaccine- induced escape mutant of Hepatitis B Virus with Multiple surface gene mutations in a Korean child, J.Korean. Med.Sci., 2001, 16, Pgs 356-361.
3. Koyanagi T et al. Analysis of HBs antigen negative variant of hepatitis B virus: Unique Substitutions, Glu 129 to Asp and Gly 145 to Ala in the surface antigen gene. Med Sci Monit, 2000; 6(6): Pgs 1165-1169.
4. Data on File: Viola Diagnostic Systems.

SYMBOL KEYS

	Temperature Limitation		Manufacturer		This side up		Contains sufficient for <n> tests
	Use by		Consult instructions for use		Dipstick		Do not reuse
	Date of Manufacture		Catalogue Number		Batch Number / Lot Number		In vitro Diagnostic Medical Device



Manufactured by:

Viola Diagnostic Systems

A Division of Tulip Diagnostics (P) Ltd.

Plot No. 33, Sector-3, I.I.E. SIDCUL, Pantnagar, U. S. Nagar,
Uttarakhand - 263 153, INDIA.

Regd. Office: Gitanjali, Tulip Block, Dr. Antonio Do Rego Bagh, Alto Santacruz,
Bambolim Complex P.O., Goa - 403 202, INDIA.

Website : www.tulipgroup.com, Email : sales@tulipgroup.com

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