

TREP^{Screen} Treponema Pallidum

DRG



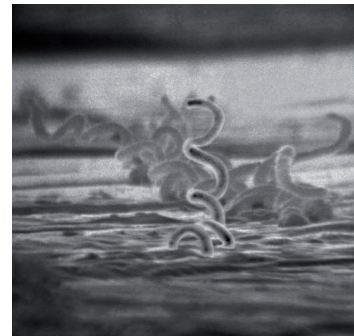
DRG

DRG ELISA

Treponema Pallidum

TREP Screen

Superspecific ELISA for detection of Treponema IgA/IgG/IgM Antibodies



Advantages of the DRG TREP Screen ELISA

- Samples (serum or plasma) do not require pre-dilution: 100 µl of sample can be added directly to the well.
- The assay detects all isotypes which is essential in order to identify all patients with early disease.
- Low number of "equivocals", negatives result in low o.d. values, while most positives generate results > 3.0 o.d. units.
- Incubations are carried out at 37°C reducing variation due to changes in temperature.
- Sample incubation time (standard 1hr) can be modified to enhance through-put on an EIA processor or robot.
- High sensitivity for all stages of syphilis (> 99.9% in active Syphilis) (> 90% in darkfield positive patients).
- Specificity > 99.9%, no cross reactions due to e.g. Lyme borreliosis.
- High tolerance for potentially interfering substances such as lipids, haemoglobin etc; samples can be taken directly from centrifuged blood clots.
- This EIA assay is well suited for automation, it provides objective results which can be integrated in a Laboratory Information System (LIS) through barcoding.



Essential steps in DRG-Syphilis-Screen

1. Antibody (of all isotypes) attaches specifically with one antigen combining site to its corresponding antigen (attached to the well).
2. After removal of unbound materials; a mixture of HRPO-conjugated recombinants is added.
3. Unbound conjugate is washed away.
4. Substrate (TMB) is added for chromogenesis.
5. Stop solution is added to terminate color development.
6. The contents of the well are measured in a MTPL-Reader.
7. Results are calculated

TREP Screen ELISA

EIA-5054

Sample volume: **20 µl** Serum/Plasma
Incubation time: 60/60/30 min at 37 °C
Sensitivity: > 99,9 % in active Syphilis
Specificity: > 99,9 %

EIA-4697

Sample volume: **100 µl** Serum/Plasma
Incubation time: 60/30/15 min at 37 °C
Sensitivity: > 99,9 % in active Syphilis
Specificity: > 99,9 %

Syphilis Diagnosis: The DRG Advantage

With an estimated 16 million cases of infectious syphilis annually leading to about 1.5 million cases of congenital syphilis, the infection continues to be a leading cause of morbidity and mortality in the world. As efficacious antibiotic treatment is available, timely and reliable tests to establish infection together with such treatment should result in lowering the burden of disease globally.

Following a fortuitous discovery by Wassermann and colleagues the first serologic test for syphilis was introduced in 1906.

Considering the inability to diagnose the disease on clinical grounds the need for such test was so great that it was readily accepted, notwithstanding its many shortcomings which were essentially ignored. The test was not only immediately accepted, till today it has survived as the gold standard, albeit in different forms such as VDRL, RPR, etc. In the absence of in vitro culture techniques for *T. pallidum*, the causative spirochete of syphilis, Wassermann extracted syphilitic tissue in order to obtain treponemal antigens required to detect specific antibodies in patients. It was eventually realized that the extract contained cardiolipin and that his positive test results were due to the presence of anti cardiolipin antibodies in patients with infectious syphilis and, as was shown later, many other conditions and diseases. Hence cardiolipin based tests are referred to as non-specific tests for syphilis. In contrast, tests based on treponemal antigens are known as specific or treponemal tests.

The first of such treponemal tests (Treponema pallidum Immobilization test, TPI) was introduced by Nelson and Maier in 1949, which was soon followed by other tests based on fluorescence and agglutination (FTA-ABS and TPHA/MHA-TP). Based on the assumption that non-specific tests are adequate to detect infectious/active syphilis when confirmed by a treponemal antibody test and the observation that treponemal antibody persists in most cases following appropriate treatment, such a testing algorithm was uniformly accepted.

Specific or Treponemal Tests

From a number of studies it can be concluded that treponemal antigen preparations derived from infected rabbits (the only practical source of the spirochete) do not have absolute specificity and can give rise to false positives. For example FTA-ABS, the test of choice for early, primary infection, may be false positive in 1% of the North American population. On the other hand, agglutination tests are of high specificity but lack sensitivity. As with non-specific tests, attempts to increase sensitivity is likely to result in additional false positive results.

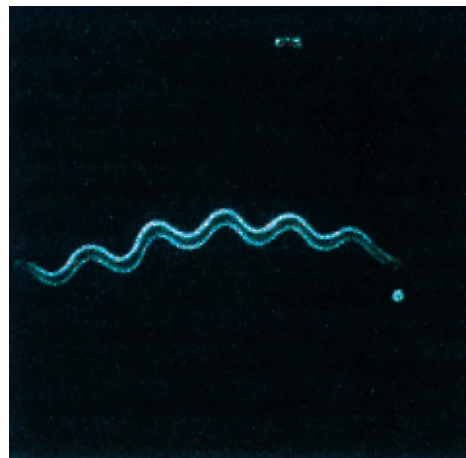
Numerous Western blot analyses and two dimensional chromatography show a myriad of bands with syphilitic and non-syphilitic sera. However syphilitic sera, of all stages, show the consistent presence of antibodies to a number of antigens.

Shortcomings/Uncertainties

Under routine operating conditions of a laboratory the overall sensitivity of established algorithms can be as low as 50% in patients with primary syphilis. In addition, patients with very high anti-cardiolipin, suggesting active infections, may give rise to false negative results due to a phenomenon known as „prozone“. Infectivity of such sero-negative patients has been shown by PCR.

Furthermore, a large percentage of infected patients who do not receive treatment, show a tendency to eventually become non-reactive in non-specific tests. There is also considerable evidence that re-infection in high risk patients cannot be diagnosed based on non-specific tests.

Attempts to increase the sensitivity of non-specific tests does not increase the diagnostic efficacy as specificity is negatively affected.



These antigens which are characterized by their molecular masses are known as 15, 17, and 47 and frequently 44.5 (TnpA) KD. Progress in molecular biology has made it possible to produce such antigens by expressing the treponemal genes in suitable micro-organisms such as *E. coli*, which contrary to *T. pallidum* can be grown in vitro at low cost and high purity.

Due to the high intrinsic specificity of treponemal recombinant antigens, they have been successfully used in a number of assays. Many such tests require a secondary antibody conjugated with a suitable enzyme to magnify the presence of human (anti-treponema) antibody in the patient's serum. It has been shown that such conjugates lower either the overall sensitivity of the test, and/or fail to detect some of the antibody isotypes. Recognizing such shortcomings and hence the reduced sensitivity of the technologies, DRG circumvented them by adopting a technique known as „antibody bridging“.

ELISAS Infectious Diseases

Parasites

Ascaris lumbricoides
Cryptosporidium
Echinococcus
Entamoeba histolical
Fasciola
Giardia lamblia
Leishmania
Malaria
Schistosoma mansoni
Strongyloides
Taenia solium
Toxocara canis
Toxoplasma gondii
Trichinella spiralis
Trypanosoma cruzi
(Chagas Disease)

Bacteria

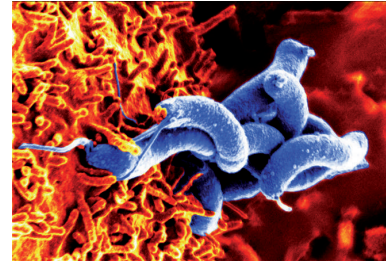
Bordetella pertussis
Borrelia burdorferi (Lyme)
Brucella
Chlamydia
Clostridium difficile toxin
Corynebacterium diphtheriae toxin
E.coli Verotoxin
Gardnerella vaginalis
Helicobacter pylori
Legionella pneumophila
Leptospira
Mycoplasma hominis
Mycoplasma pneumoniae
Mycobacterium tuberculosis
Tetanus (Clostridium tetani) toxin
Treponema pallidum (Syphilis)
Tuberculosis (TB)
Ureaplasma urealyticum
Yersinia enterocolitica
Rickettsia conorii

Virus

Adenovirus
Astrovirus
Cytomegalovirus (CMV)
Dengue Virus
Epstein-Barr Virus (EBV)
Flavivirus (West Nile)
Hepatitis Virus
Herpes Simplex Virus (HSV)
Influenza A and B Virus
Measles Virus
Mumps Virus
Parainfluenza 1/2/3 Virus
Parvovirus B19
Rotavirus
Respiratory Syncytial Virus (RSV)
Rubella Virus
Tick-borne encephalitis Virus
Varicella Zoster Virus
Enterovirus
Chikungunya
HPV IgG

Fungi

Aspergillus fumigatus
Candida albicans



DRG Diagnostics

DRG Instruments GmbH, mit Sitz in Marburg, wurde im Jahre 1973 als Niederlassung von DRG International, Inc. USA gegründet. Heute widmet sich die Firma hauptsächlich der Entwicklung, Produktion und dem weltweiten Vertrieb von neuen und innovativen ELISA Testsystemen. Die DRG ist nach ISO 9001 und ISO 13485 zertifiziert.

DRG Diagnostics

DRG Instruments GmbH, founded in 1973 by Dr. Geacintov, subsidiary of DRG Intl. Inc., USA, is a diagnostics manufacturer of ELISAS. The DRG Group operates through a network of DRG subsidiaries in Germany, Poland, Russia, China and the Czech Republic and through distributors worldwide.



ELISAS that perform

DRG entwickelt, produziert und vertreibt diagnostische ELISA Testkits für den Gebrauch in Klinik und Forschung. Die Erfahrung unseres Produktions- und Managementteams garantiert hochqualitative Produkte mit einem guten Preis-Leistungs-Verhältnis und einem exzellenten Kundenservice. DRG Kits bieten beste Qualität, hervorragende Performance und Reproduzierbarkeit sowie einfache Handhabung: Mikrotiterstrips einzeln brechbar, gebrauchsfertige Reagenzien, kurze Inkubationszeiten und lange Haltbarkeit. Unsere ELISA Kits sind erhältlich in verschiedenen Formaten und damit anpassungsfähig an die Bedürfnisse des Kunden und der Märkte.

ELISAS that perform

DRG develops and manufactures diagnostic ELISA test kits for use in clinical and research laboratories. The experience of our production and management team guarantees to provide high quality products, competitive prices and excellent customer service.

DRG works to EN ISO 9001:2000 and EN ISO 13485:2003 + AC:2007 standard, certified by TÜV Rheinland Product Safety GmbH, an indication of our commitment to customer service, quality control and improved health care.



DRG Instruments GmbH, Germany
Frauenbergstraße 18
D-35039 Marburg
Tel. +49 (0) 64 21/170 00,
Fax +49 (0) 64 21/17 00 50
Internet: www.drg-diagnostics.de
E-mail: drg@drg-diagnostics.de

Distributed by



DRG International Inc. USA
1167 U.S. Highway 22 East
Mountainside, N.J. 07092 USA
Phone: +1 (908) 233-2079
Fax +1 (908) 233-0758
Internet: www.drg-international.com
E-mail: corp@drg-international.com