

Wasserman Test Encyclopedia Article

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Wasserman Test

The Wasserman test is used to diagnose the illness known as **syphilis**. The test is named after its developer, the German bacteriologist August Wasserman (1866-1925). The Wasserman test was devised in 1906.

The Wasserman test is used to detect the presence of the bacterium that causes syphilis, the spirochete (spiral-shaped microorganism) *Treponema pallidum*. The basis of the test is the reaction of the **immune system** to the presence of the bacterium. Specifically, the test determines the presence or absence of an **antibody** that is produced in response to the presence of a constituent of the membrane of *Treponema pallidum*. The particular constituent is the membrane phospholipid.

The Wasserman test represents one of the earliest applications of an immunological reaction that is termed **complement** fixation. In the test, a patient's serum is heated to destroy a molecule called complement. A known amount of complement (typically from a guinea pig) is then added to the patient's serum. Next, the **antigen** (the bacterial phospholipid) is added along with red blood cells from sheep. The natural action of complement is to bind to the red blood cells and cause them to lyse (burst). Visually, this is evident as a clearing of the red-colored suspension. However, if the added antigen has bound to antibody that is present in the suspension, the complement becomes associated with the antigen-antibody complex. In technical terms, the complement is described being "fixed." Thus, if lysis of the red blood cells does not occur, then antibody to *Treponema pallidum* is present in the patient's serum, and allows a positive diagnosis for syphilis.

The Wasserman test is still used in the diagnosis of syphilis. However, the test has been found to be limiting, as antibodies to the bacterium are not prevalent in the early stages of the disease. Thus, a patient who had contracted syphilis--but who is in the earliest stages of infection--could produce a negative Wasserman test. This can compromise patient health and treatment, as syphilis becomes more serious as the disease progresses with time.