Serological tests 2
(Antigen antibody interactions)
Lab 3

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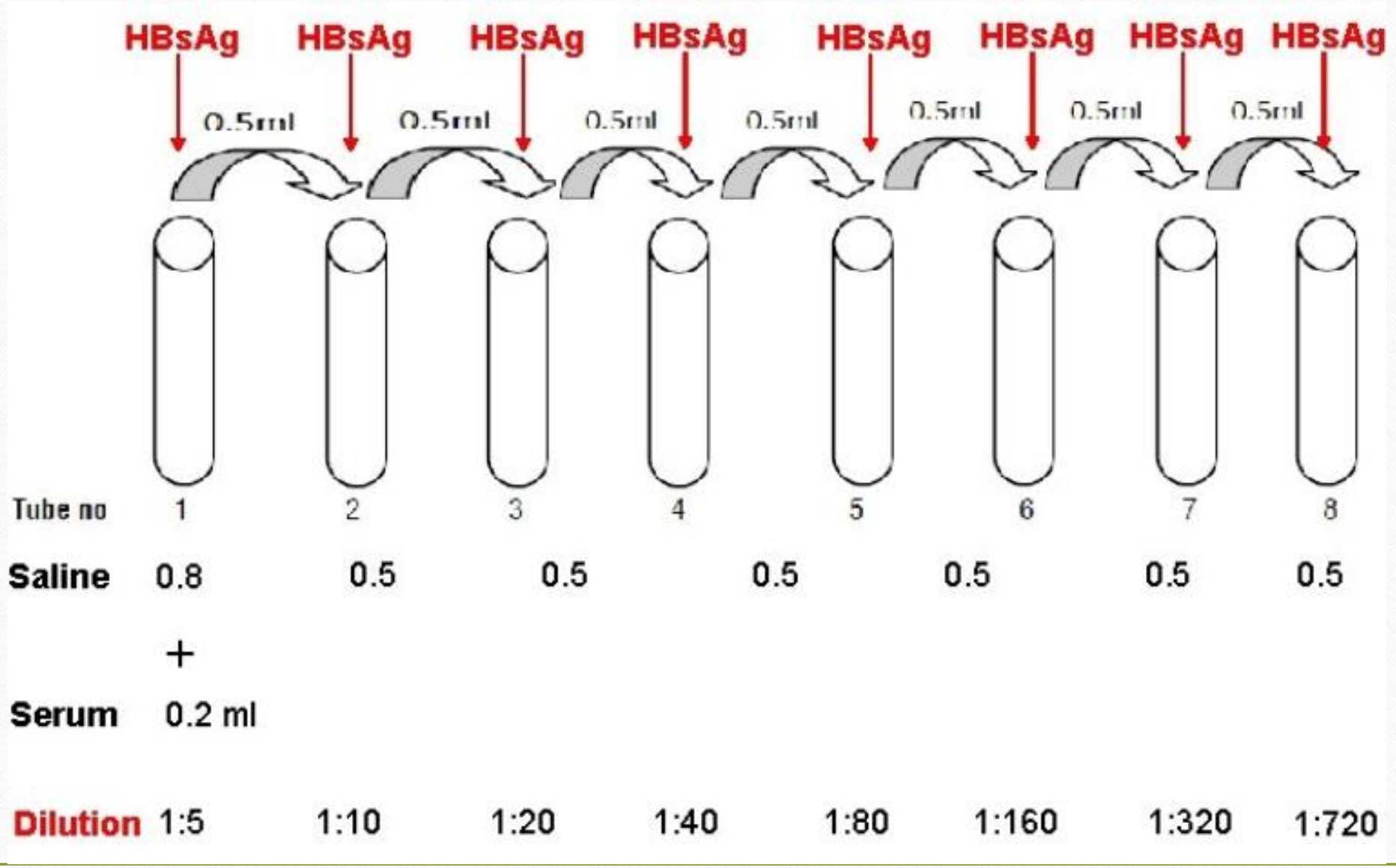
Examples of kits

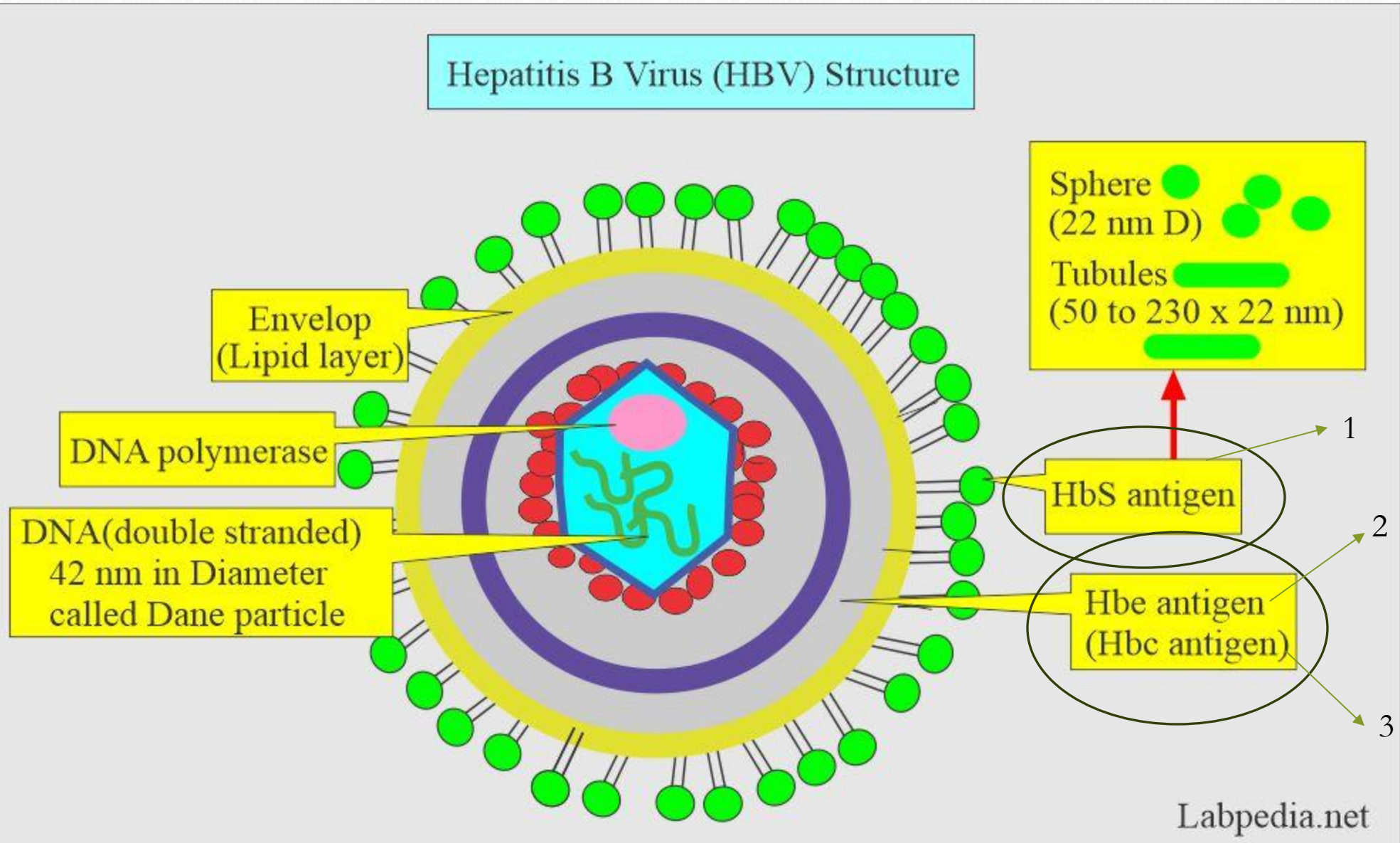
HCG Latex Agglutination Test


User's Manual
Brucella Antibody
ELISA
An ELISA testkit to detect antibodies against polysaccharide epitopes of Brucella melitensis in serum and milk samples


CODE
J79
PACK
25T
RHEUMATOID FACTOR
LATEX TEST KIT (R.A. TEST KIT)
Contents
Reagent 1 : RF Antigen (Gamma Globulin)
Reagent 2 : Positive Control
Reagent 3 : Negative Control
Accessories : Disposable Plastic Dropper, Disposable Applicator Sticks, Rubber Teat, Glass Slides
Shake well before use
CE
ISO 9001 & 13485
Certified Company
Mfg. Lic. No. G-639
BEACON
DIAGNOSTICS PVT. LTD.

Blood grouping kit


HBsAg
HBsAg
HBsAg
HBsAg
HBsAg
HBsAg
HBsAg
HBsAg
0.5ml
0.5ml
0.5ml
0.5ml
0.5ml
0.5ml
0.5ml
Tube no 1 2 3 4 5 6 7 8
Saline 0.8 0.5 0.5 0.5 0.5 0.5 0.5
+
Serum 0.2 ml
Dilution 1:5 1:10 1:20 1:40 1:80 1:160 1:320 1:720


Hepatitis B Virus (HBV) Structure
Sphere
(22 nm D)
Tubules
(50 to 230 x 22 nm)
Envelop
(Lipid layer)
DNA polymerase
DNA(double stranded)
42 nm in Diameter
called Dane particle
HbS antigen
Hbe antigen
(Hbc antigen)
1
2
3
Labpedia.net

Precipitation Reaction Types

They are mainly three types:

1. Precipitation in Solution

a) Ring Test.

b) Slide Test.

c) Tube Test.

2. Precipitation in Agar.

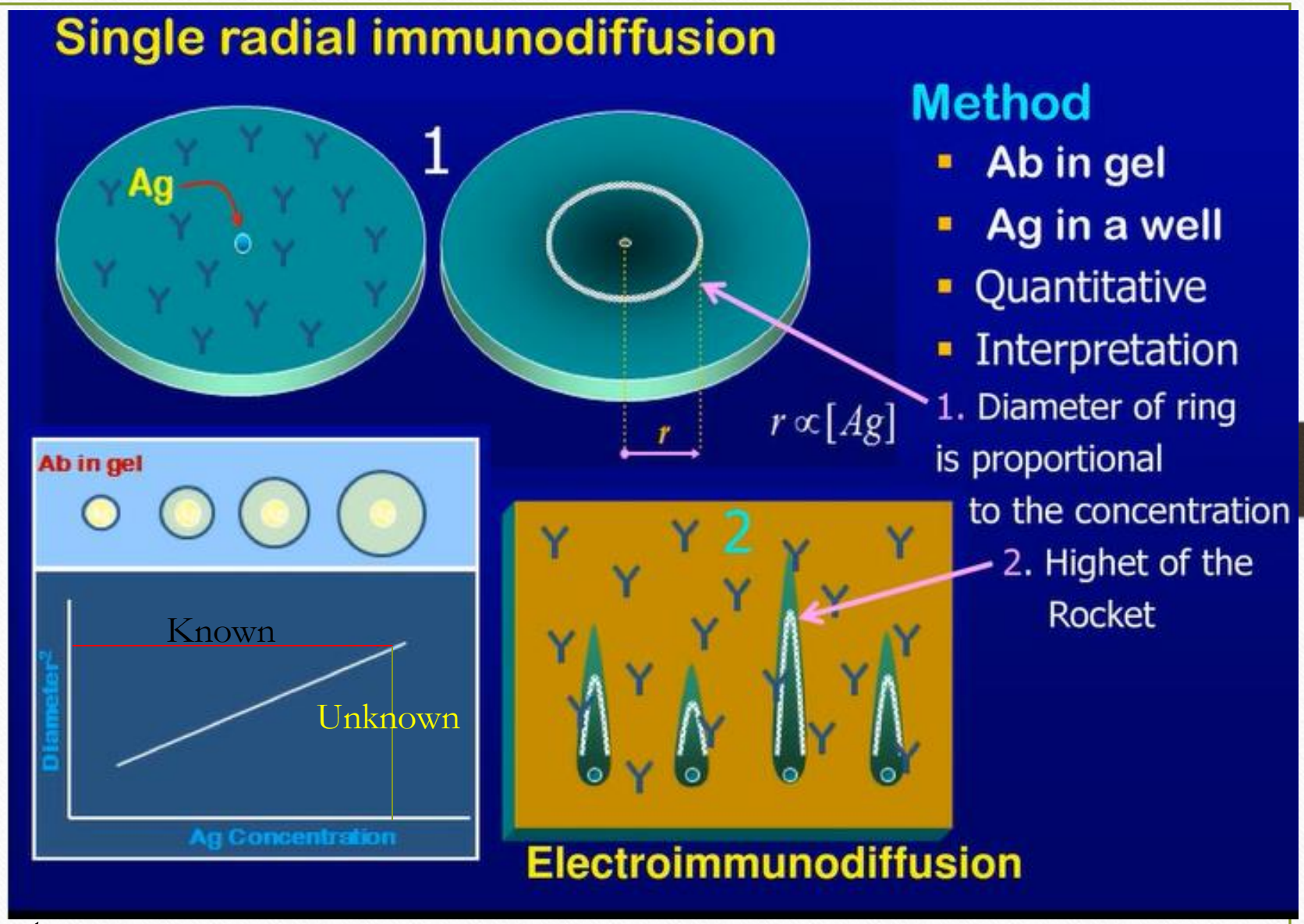
a) Single radial immunodiffusion test (Mancini test)

b) Double diffusion immunodiffusion test (Ouchterlony test)

3. Precipitation in Agar in an electric field (immunoelectrophoresis).

Mancini test:

It is a single diffusion technique whereby a solution containing the antigen is placed into wells in a gel or agar surface evenly impregnated with antibody. The diameter of the ring that precipitates around the well as a result of antigen antibody reaction corresponds to the amount of antigen in the solution.



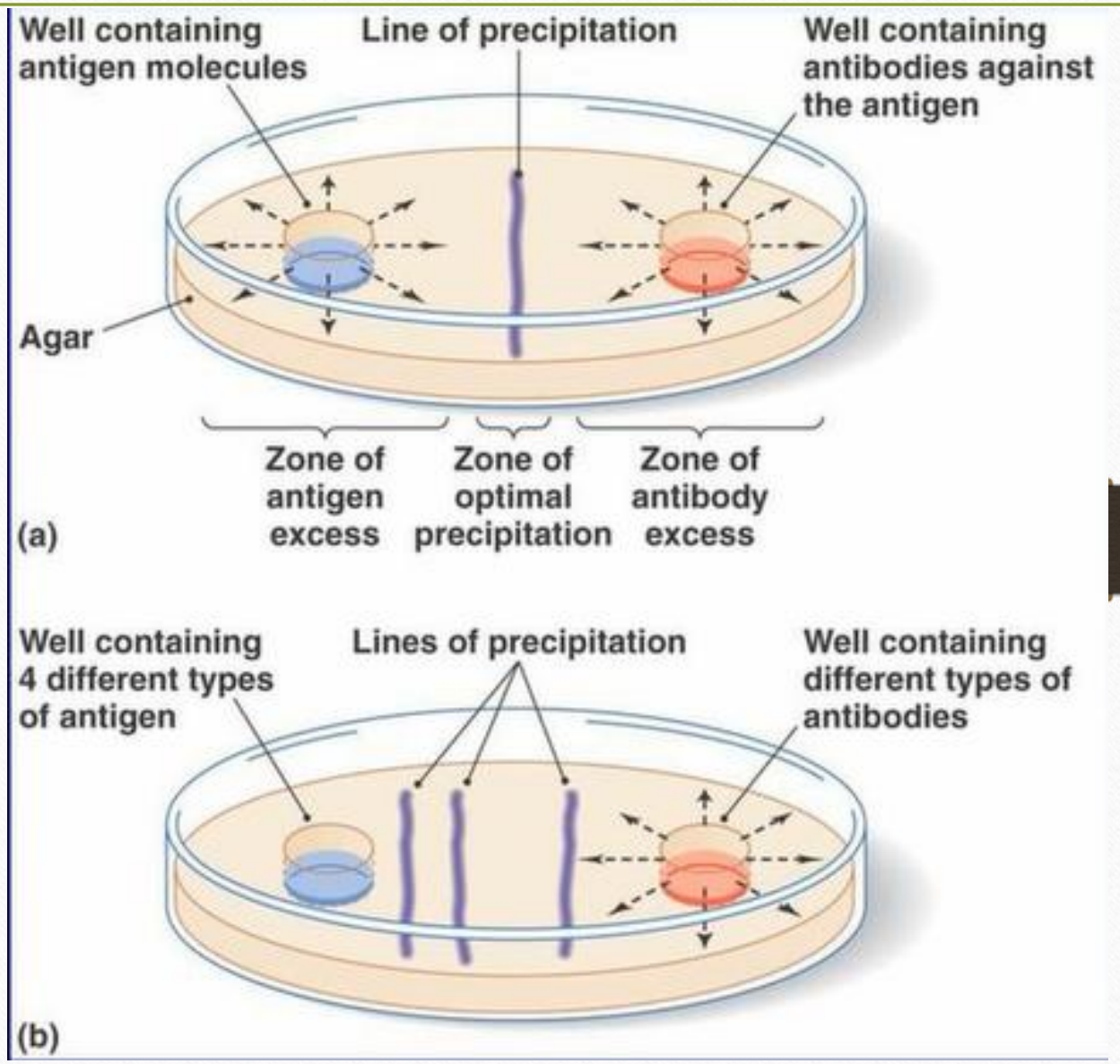
Series of standards containing known concentration of Ag

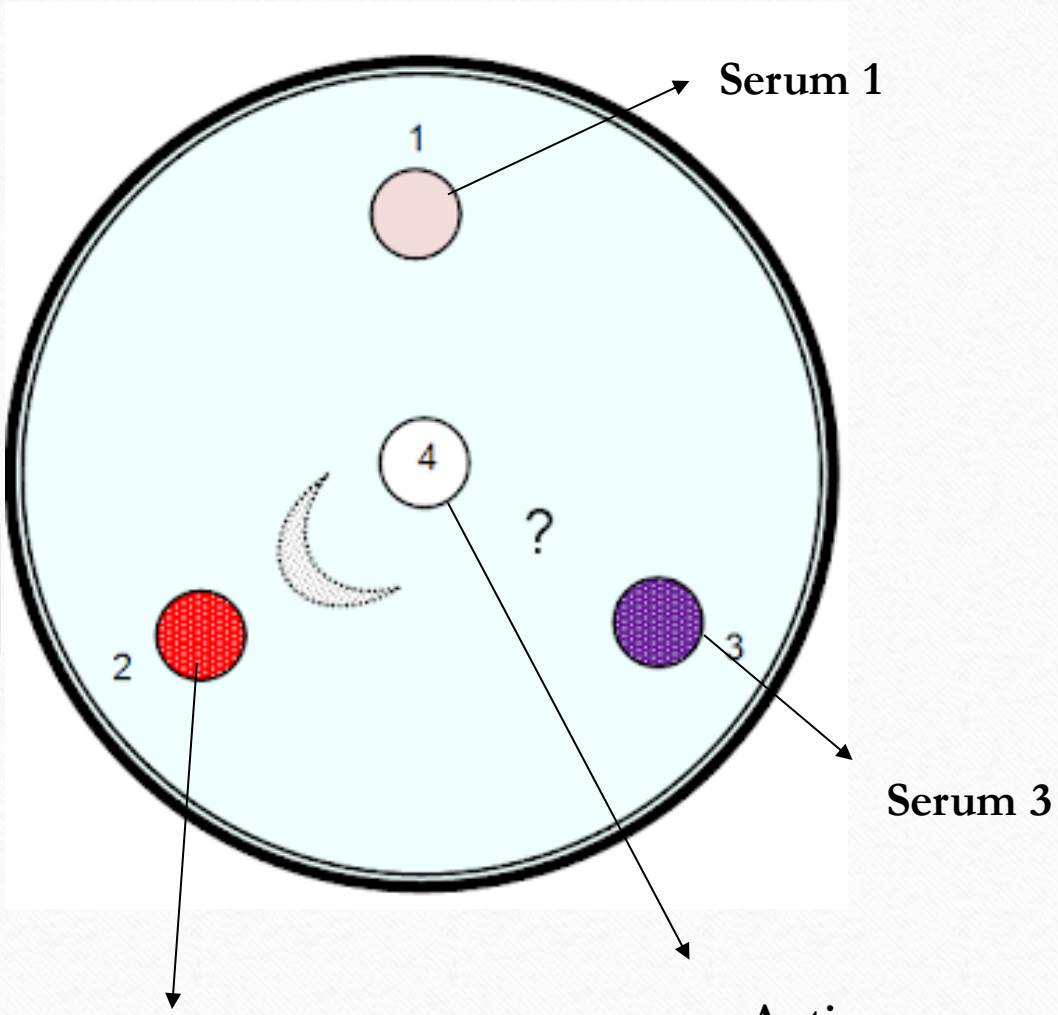
Ouchterlony Gel Diffusion

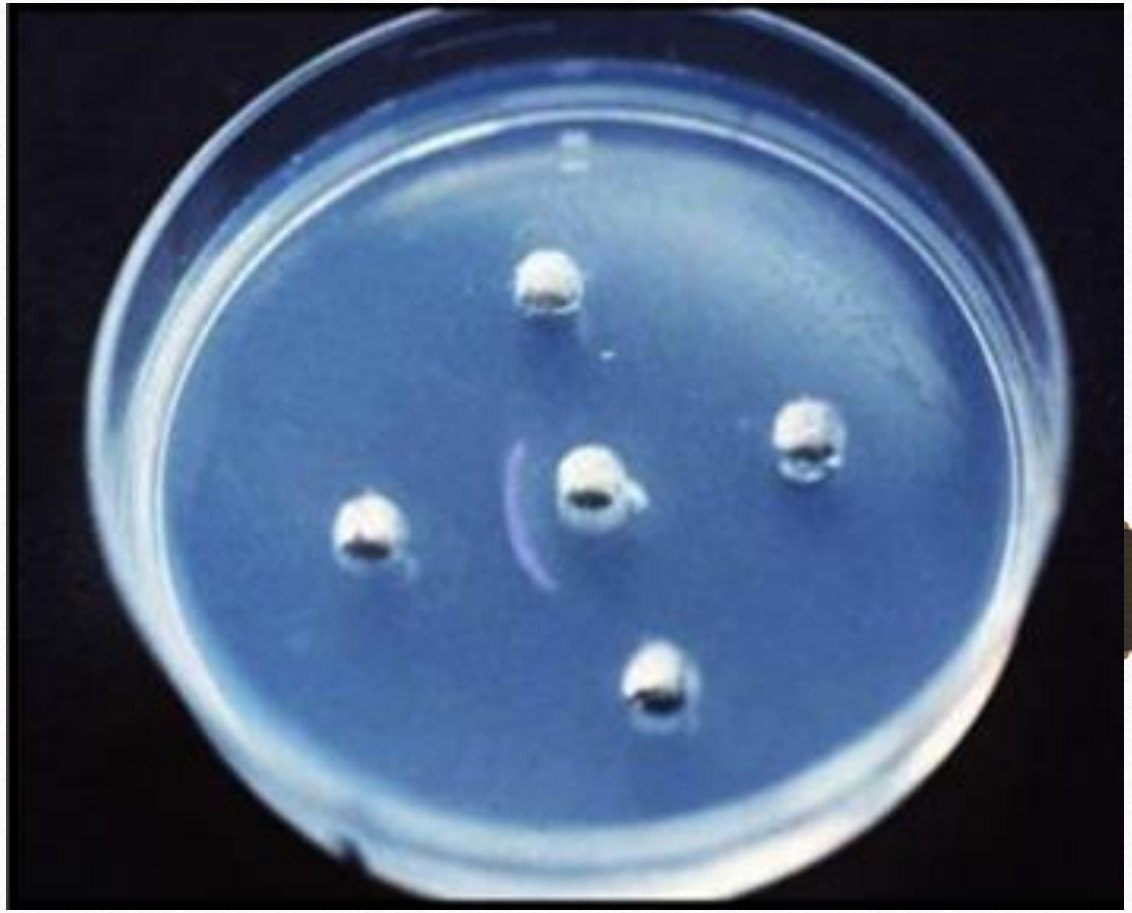
- Both antigen and antibody can diffuse independently.
- Holes punched in agar.
- Known antibody or antigen added to center well.
- Known sample added to outer well.
- Unknown sample added to outer well next to unknown sample.
- Wait for bands to form.

Ouchterlony test

- The Ouchterlony Test is used for qualitative analysis, not for quantitative measurement.



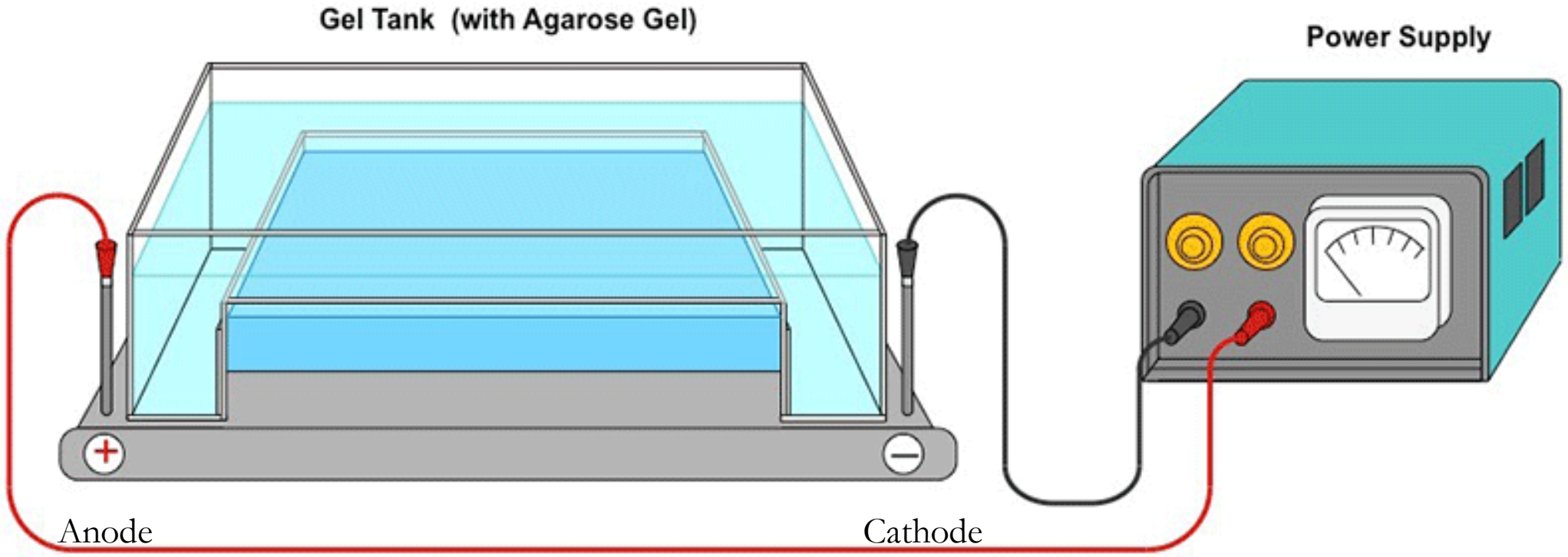

Serum 1
1
4
?
2
3
Serum 3
Antigen
Serum 2



3. Principle of Immunoelectrophoresis

- When an electric current is applied to a slide layered with gel, the antigen mixture placed in wells is separated into individual antigen components according to their charge and size.
- Following electrophoresis, the separated antigens are reacted with specific antisera placed in troughs parallel to the electrophoretic migration, and diffusion is allowed to occur.
- Antiserum present in the trough moves toward the antigen components resulting in the formation of separate precipitin lines in 18-24 hrs, each indicating reaction between individual proteins with their antibody.

Immunoelectrophoresis



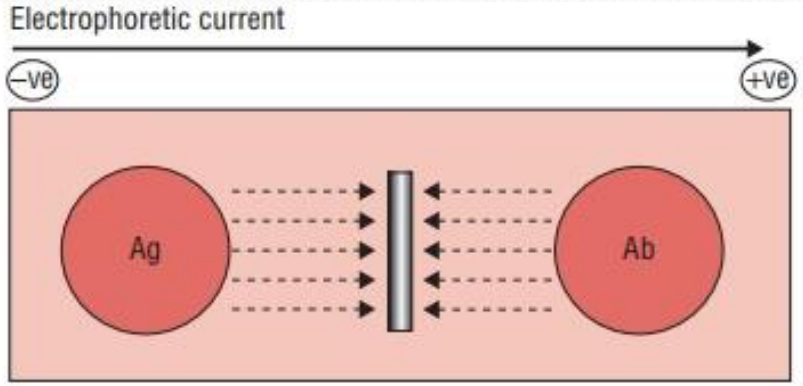


FIG. 14-6. Counter-current immunoelectrophoresis.

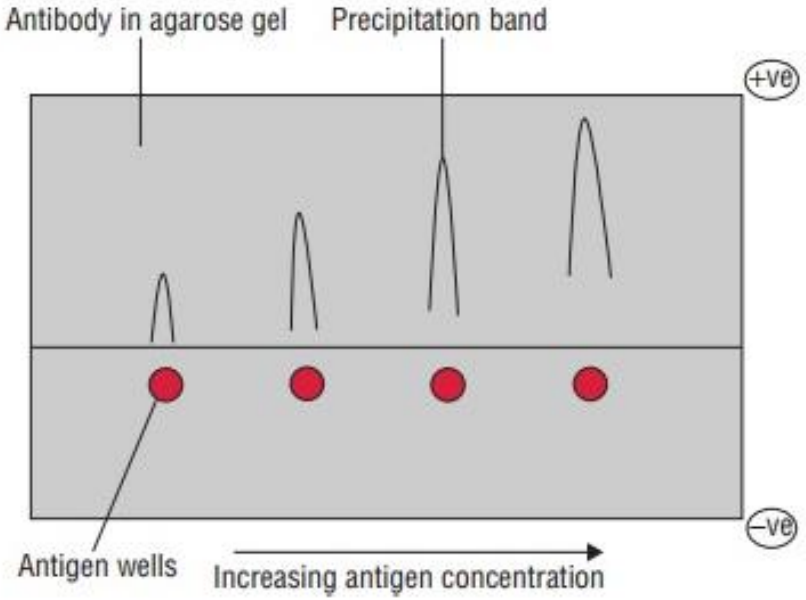
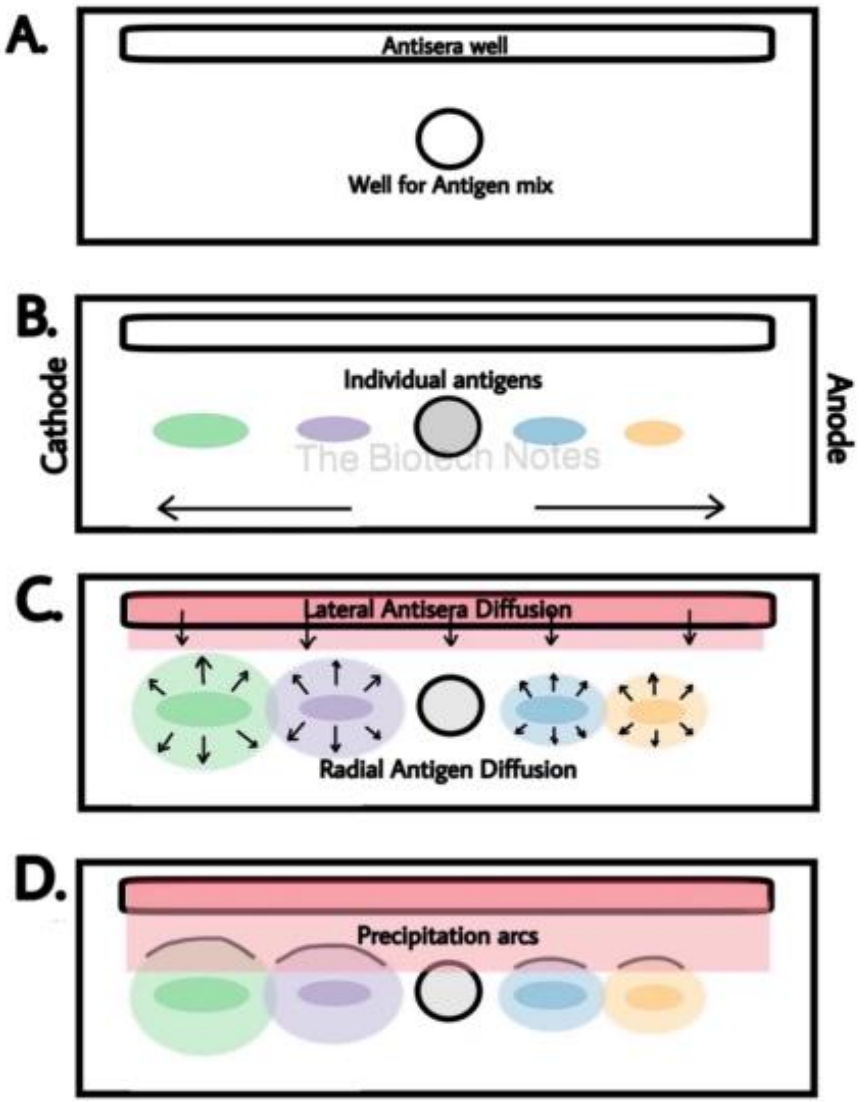


FIG. 14-7. Rocket electrophoresis.



Neutralization Tests

- Used to assess the effectiveness of neutralizing antibodies against specific pathogens or toxins.
- These tests applications in the fields of virology, immunology, and vaccine development.
- The primary purpose of neutralization tests is to determine if a given antibody or serum can neutralize the infectivity or toxicity of a particular pathogen or toxin.

These tests are broadly of two types:

(a) Virus neutralization tests.

(b) Toxin neutralization tests.

Virus neutralization tests

- Neutralization of viruses by their specific antibodies are called virus neutralization tests. Inoculation of viruses in cell cultures, eggs, and animals results in the replication and growth of viruses. When virus-specific neutralizing antibodies are injected into these systems, replication and growth of viruses is inhibited.
- **Viral hemagglutination inhibition** test is an example of virus neutralization test frequently used in the diagnosis of viral infections, such as influenza, mumps, and measles. The test involves mixing the virus with serum or antibodies and observing whether the virus is able to infect host cells. If the antibodies can neutralize the virus, there will be no infection, and the test result is positive for neutralization.

Toxin neutralization tests

- Toxin neutralization tests are laboratory assays used to assess the ability of antibodies or other agents to neutralize the toxic effects of specific toxins, often produced by bacteria or other microorganisms. These tests are important for diagnosing and treating diseases caused by toxins.

Examples of neutralization tests include:

- ***In vivo***— Schick test to demonstrate immunity against diphtheria, and

-*********Clostridium welchii* **(*Clostridium perfringens*)**toxin neutralization test in guinea pig or mice.

-***Clostridium botulinum*** toxin botulism.

- ***In vitro***— (a) Anti-streptolysin O test. a blood test used to measure the level of anti-streptolysin O antibodies in the bloodstream. This toxin produced by ***Streptococcus pyogenes***

(b) Nagler reaction used for rapid detection of *Clostridium perfringens*, to identify the presence of lecithinase that hydrolyzes lecithin, a component of cell membranes.

*** *Clostridium welchii* is an outdated term for a bacterium.

Immunofluorescence

- The property of certain dyes absorbing light rays at one particular wavelength (ultraviolet light) and emitting them at a different wavelength (visible light) is known as fluorescence. Fluorescent dyes, such as fluorescein isothiocyanate and lissamine rhodamine, can be tagged with antibody molecules.
- They emit blue-green and orange-red fluorescence, respectively under ultraviolet (UV) rays in the fluorescence microscope.
- This forms the basis of the immunological test. Immunofluorescence tests have wide applications in research and diagnostics. These tests are broadly of two types:

1. Direct immunofluorescence test

2. Indirect immunofluorescence test

Direct immunofluorescence test is widely used for detection of bacteria, parasites, viruses, fungi, or other antigens in CSF (Cerebrospinal Fluid), blood, stool, urine, tissues, and other specimens.

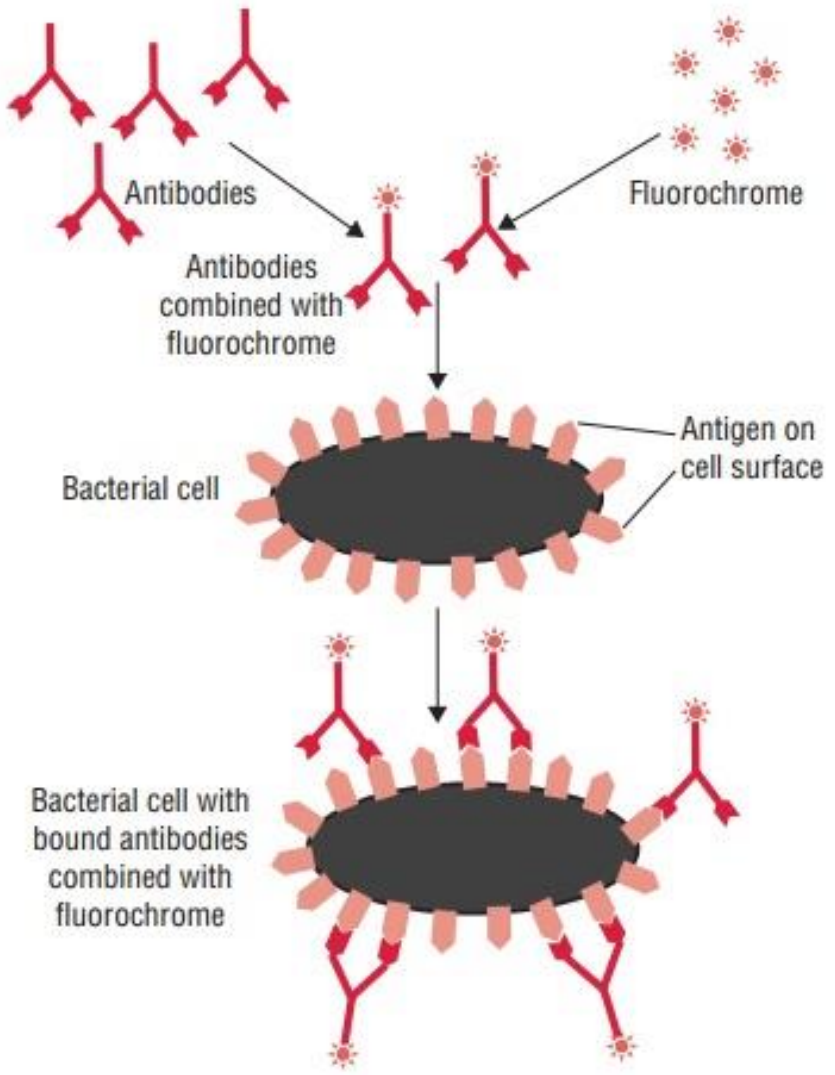
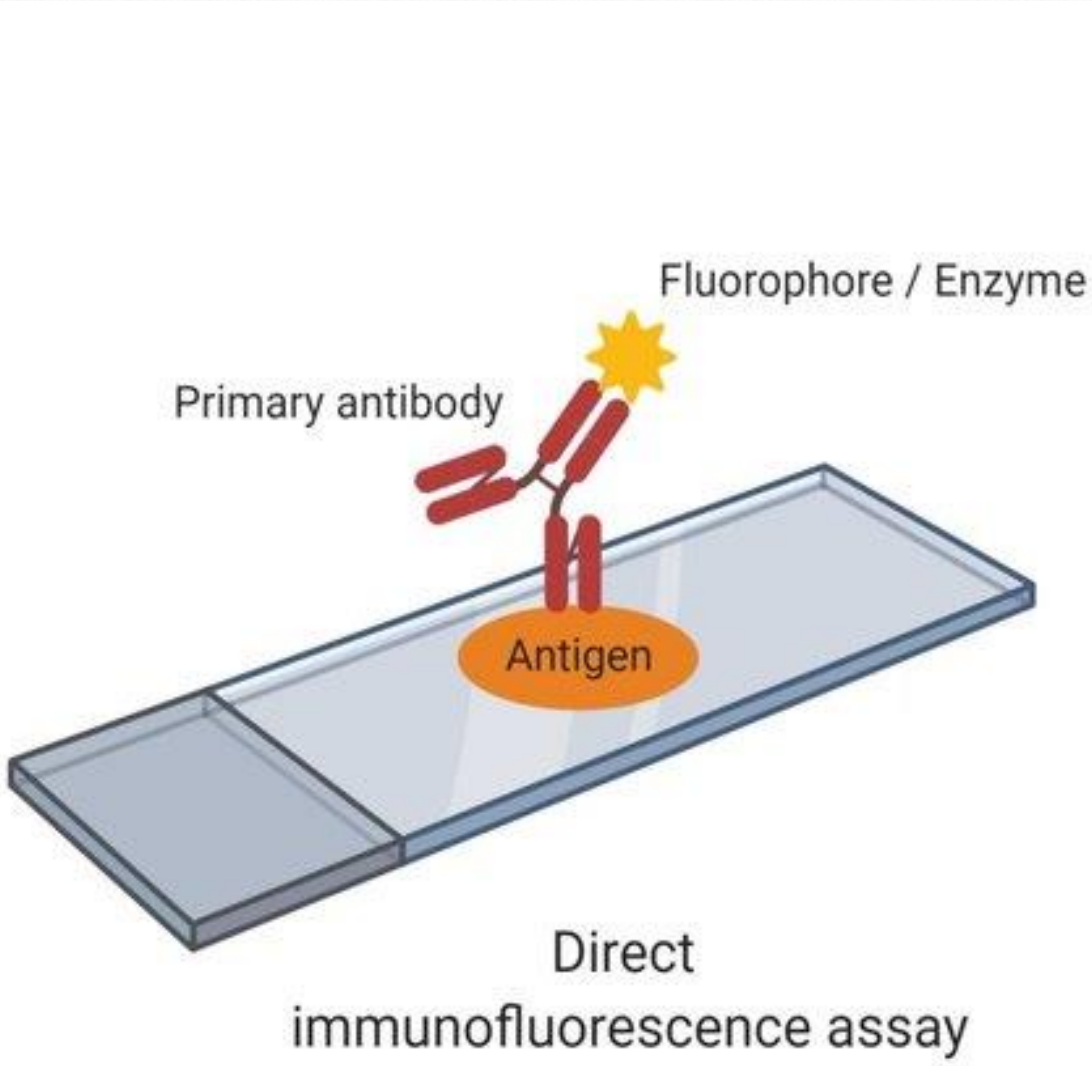


FIG. 14-13. Direct fluorescent antibody test.

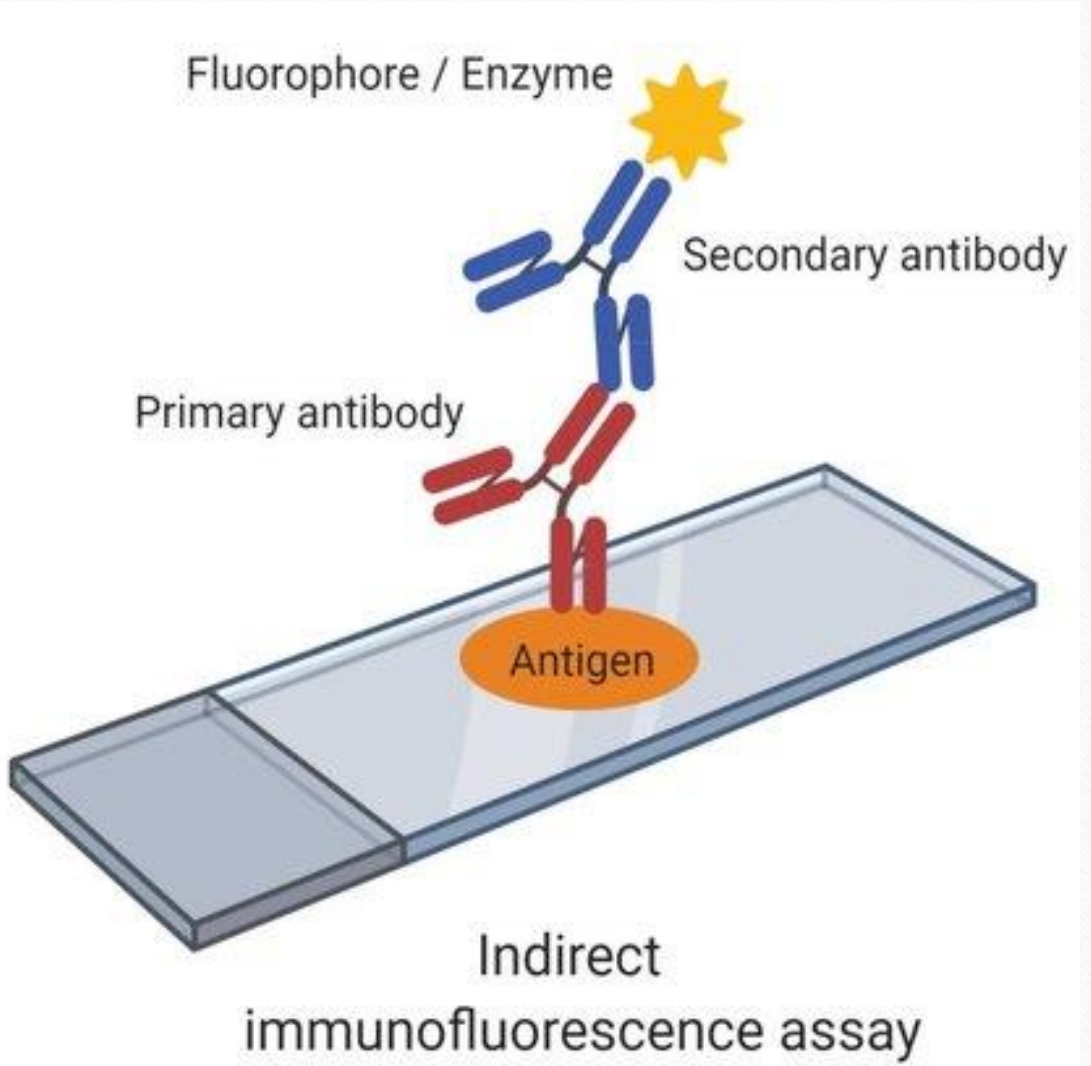
Indirect immunofluorescence

Is a two-stage process.

- **First stage**, a known antigen is fixed on a slide. Then the patient's serum to be tested is applied to the slide, followed by careful washing. If the patient's serum contains antibody against the antigen, it will combine with antigen on the slide.
- **Second stage**, the combination of antibody with antigen can be detected by addition of a fluorescent dye-labeled antibody (Secondary Ab) to human IgG, which is examined by a fluorescence microscope.



Direct
immunofluorescence assay



Indirect
immunofluorescence assay