



Department of Medical Laboratory Techniques

parasite / practical

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Lecturer 7

Phylum: Protozoa:

Class: Flagellates.

Leishmania Tropica Complex

It includes three species:

- *Leishmania tropica*
- *Leishmania major*
- *Leishmania aethiopica*

* All these species cause **old world cutaneous leishmaniasis**. The disease is also known as **oriental sore, Delhi boil, Bagdad boil, or Aleppo button**.

Habitat

L. tropica causing cutaneous leishmaniasis (old world cutaneous leishmaniasis) are essentially the parasite of skin. The amastigote forms occur in the **reticuloendothelial cells of the skin**, whereas promastigote forms are seen in sandfly vector.

Morphology

Morphology of *L. tropica* complex is indistinguishable from that of *L. donovani*.

Life Cycle

The life cycle of *L. tropica* is similar to that of *L. donovani* except Vectors: The vectors of *L. tropica* complex are *Phlebotomus* sandflies

Mode of transmission:

- The most common mode of infection is through bite of sandflies.
- Infection may also sometimes occur by direct contact.
- Infection may be transmitted from man-to-man or animal-to-man by direct inoculation of amastigotes
- Infection may also occur by autoinoculation.

Pathology:

Amastigote forms are found in histiocytes and endothelial cells. There is an inflammatory granulomatous reaction with infiltration of lymphocyte and plasma cells. Early lesions are papular, followed by ulceration



necrosis. Papule and ulcer are the main pathological lesions. They heal over months to years, leaving scars.

L. braziliensis complex and L. Mexicana complex

Habitat

These occur as intracellular parasite. The amastigote form is seen inside the macrophages of skin and mucous membrane of the nose and buccal cavity. The promastigote form occurs in vector species **Lutzomyia**.

Morphology: amastigote and promastigote

Life Cycle: The life cycle of *Leishmania* species causing the new world

Cutaneous and mucocutaneous leishmaniasis is similar to that of *L. donovani* except:

- Amastigotes are found in the reticuloendothelial cells and lymphoid tissues of skin, but not in the internal organs.
- The infection is transmitted to man from animals by bite of sandfly vectors of genus **Lutzomyia**.
- Sylvatic rodents and domestic animals are the common sources and reservoir of infection.
- Direct transmission and autoinfection also occurs man to man.

Laboratory Diagnosis

1- For microscopic demonstration of the parasite, the materials collected are: Smear is made from the material obtained from the indurated edge of nodule or sore and stained by Giemsa or Leishman stain.

2- Skin test

3- **Biopsy** Amastigotes can also be demonstrated from slit-skin biopsy.

4- Serodiagnosis

These tests include:

- Indirect immunofluorescent antibody test (IFAT)
- Counter immunoelectrophoresis (CIEP)
- ELISA and DOT-ELISA
- DAT

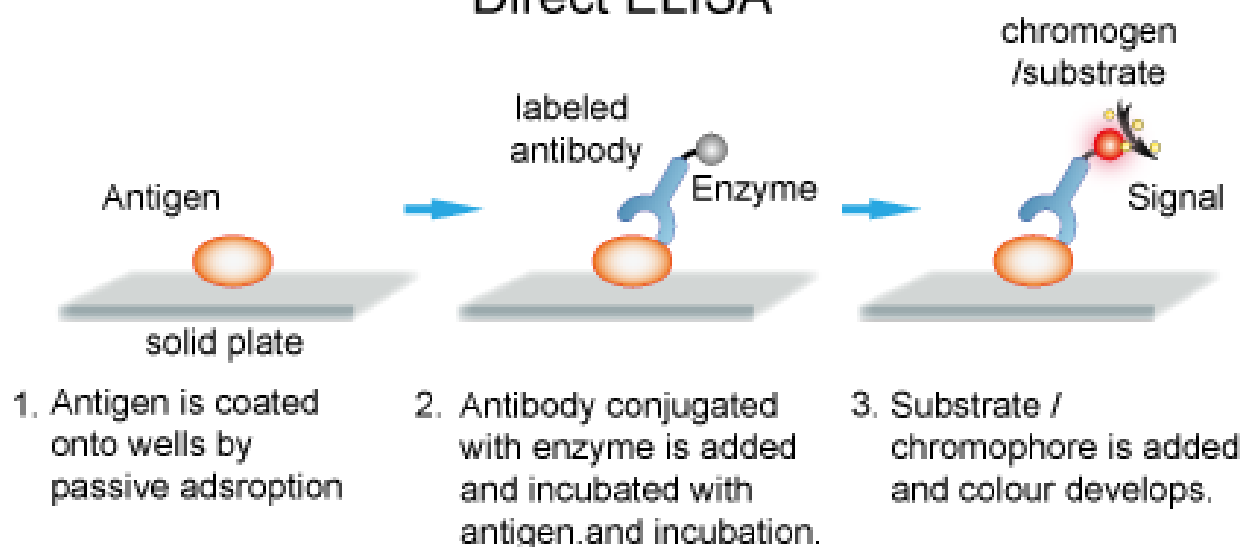
Enzyme-linked immunosorbent assay (ELISA)

The Enzyme-linked immunosorbent assay (ELISA) is an immunological assay commonly used to measure antibodies, antigens, proteins and glycoproteins in biological samples.

There are four type of ELISA:

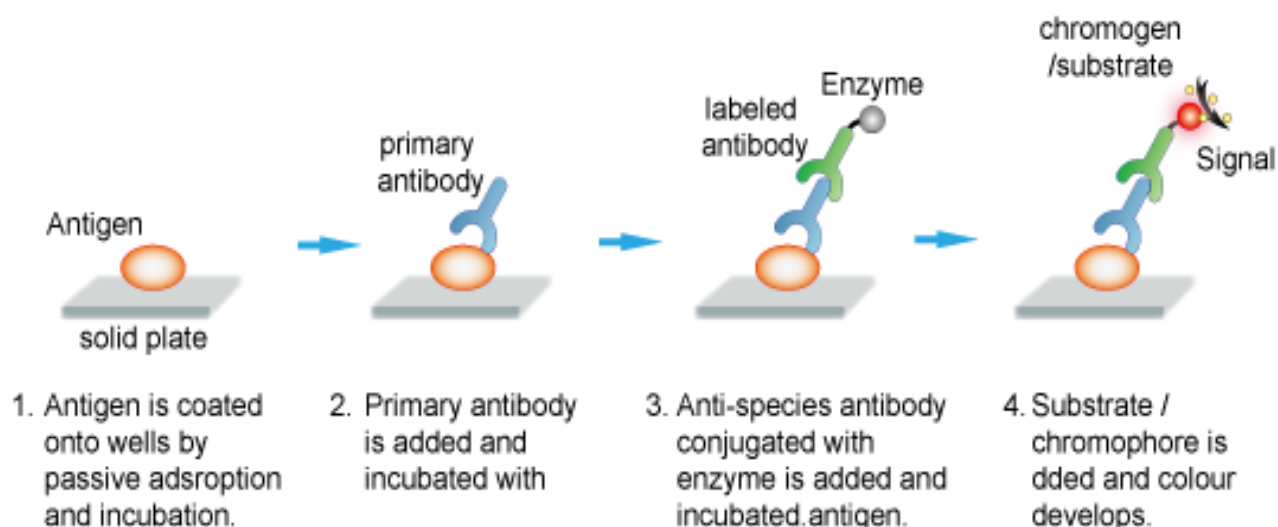
1. Direct ELISA (antigen-coated plate; screening antibody)

Direct ELISA

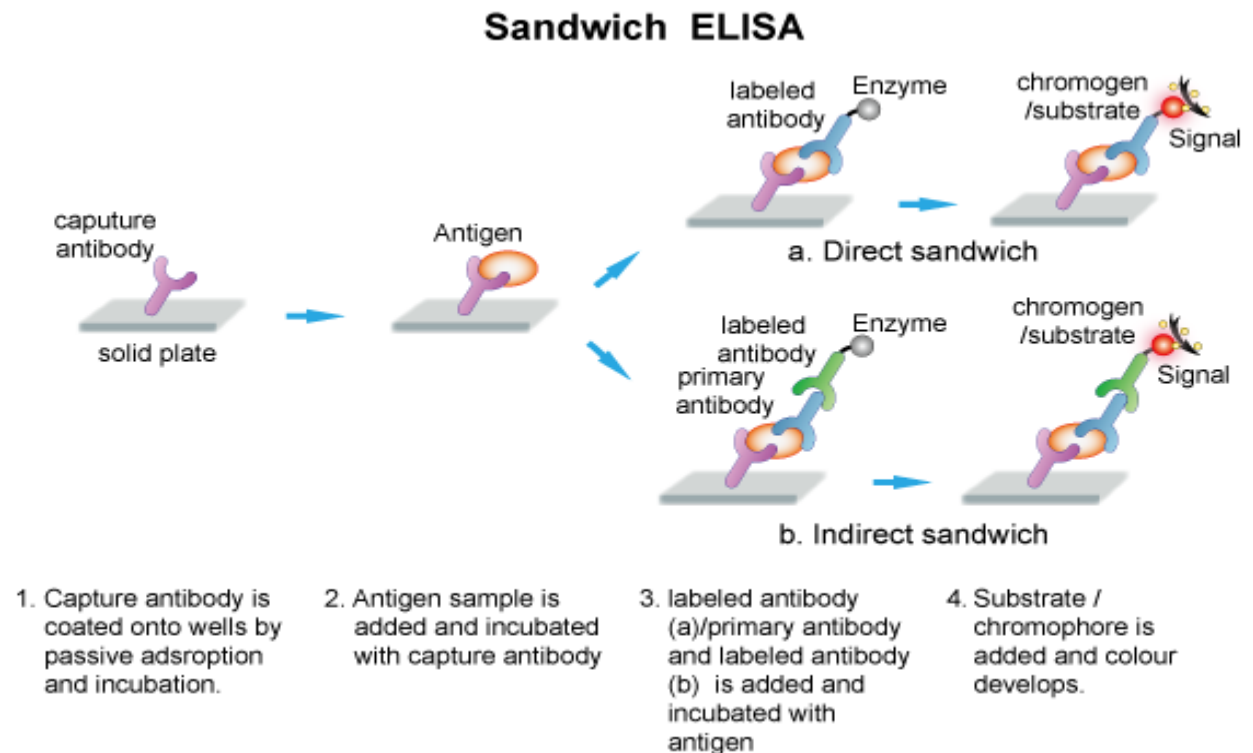


2. Indirect ELISA (antigen-coated plate; screening antigen/antibody)

Indirect ELISA

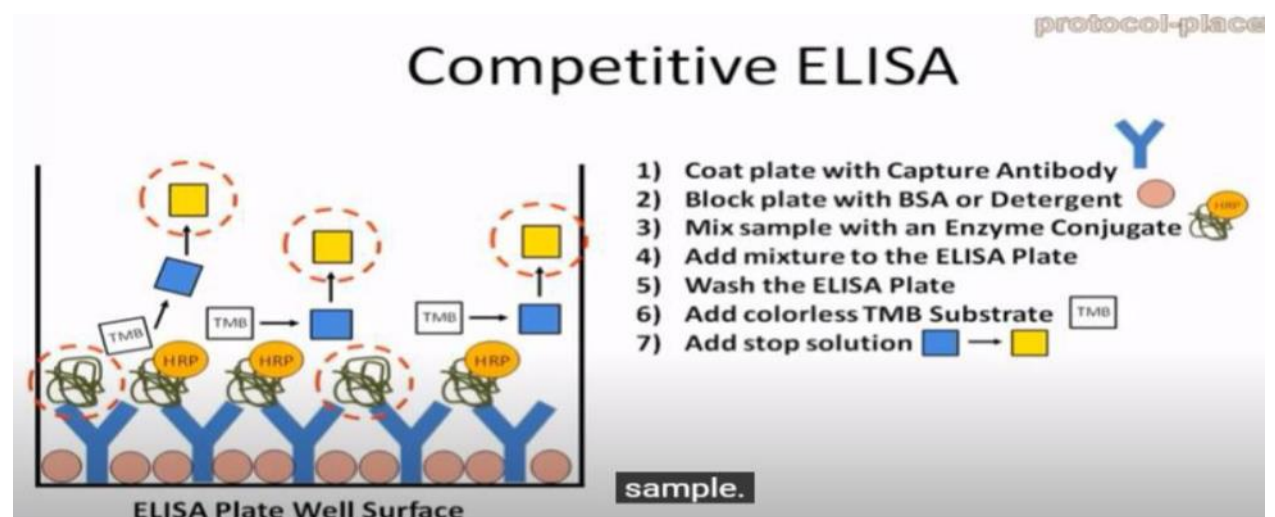


3. Sandwich ELISA (antibody-coated plate; screening antigen)



4. Competitive ELISA (screening antibody)

Also known as inhibition ELISA or competitive immunoassay, competitive ELISA assays measure the concentration of an antigen by detection of signal interference.





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