Toxo Ab

Contents

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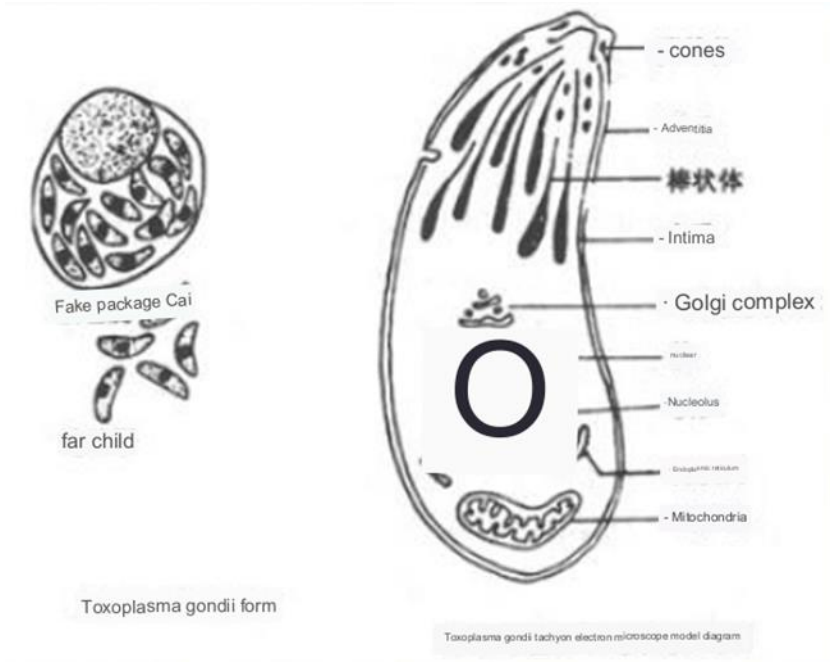
a. Toxoplasmosis

- Toxoplasmosis is a zoonotic disease that is caused by the infection of Toxoplasmosis gondii with a worldwide distribution and seriously endangers human health. Most of them are recessive infections in animals, mainly invading the eyes, brain, heart, liver, lymph, etc. It can cause a wide range of clinical symptoms, such as toxoplasma encephalitis, toxoplasma retinitis, toxoplasma peritonitis and more.
- Dogs and cats can be infected and spread Toxoplasmosis. With the gradual increase of domestic pets and close contact between people and pets, the infection rate of Toxoplasmosis in the population is increasing year by year. It is estimated that about 1/3 of the world's population is infected and the average infection rate in China (2004) has reached 7.88%.

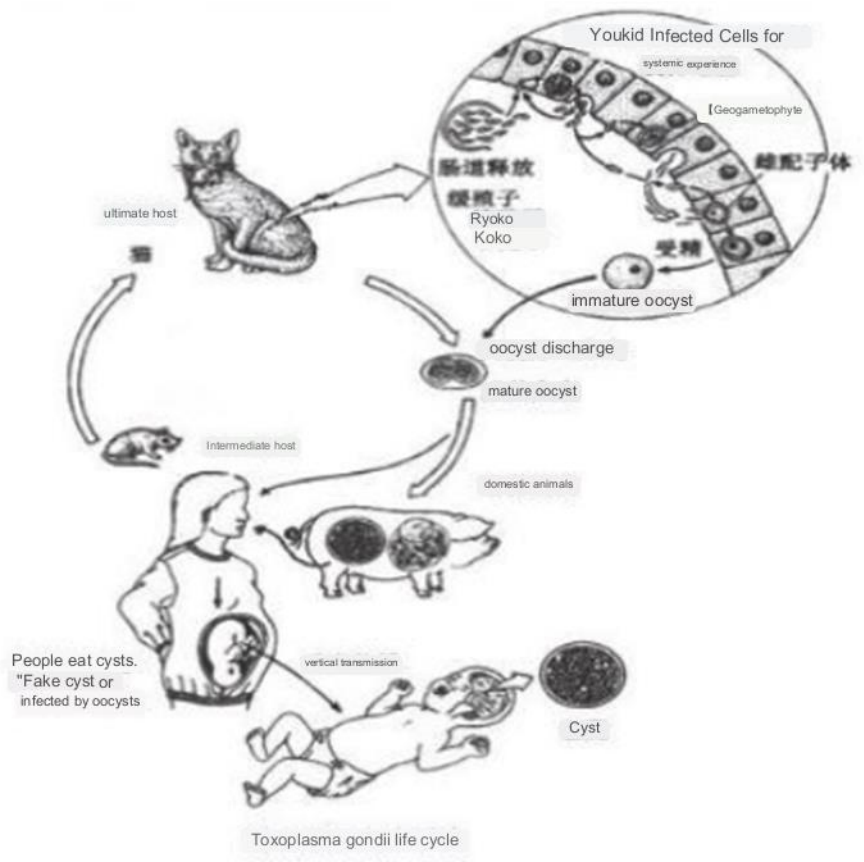
a. Toxoplasmosis

- Toxoplasma gondii is an apicomplexan subphylum, sporozoa, toxoplasma family, coccidia, intracellular parasitic protozoa. There are 5 different morphological stages in its life history, namely trophozoite (tachyzoite), cyst (which can survive in the tissue for a long time), schizont, gametophyte and oocyst. The stages that are fatal or infectious to humans are tachyzoites, cysts and oocysts.



a. Toxoplasmosis Infection Process

- The entire life cycle development of Toxoplasma gondii requires two hosts, cats, dogs and humans as the final host, and other animals as the intermediate host.



b. Clinical Symptoms of Canine Toxoplasmosis

- Symptoms of toxoplasmosis in dogs are similar to canine distemper and infectious hepatitis.
- The main manifestations are fever, anorexia, lethargy, pale mucous membranes, secretions from the eyes and nose, dyspnoea and even severe haemorrhagic diarrhoea.
- A small number of sick dogs have severe vomiting, followed by paralysis and other neurological symptoms.
- Miscarriage or premature birth occurs in pregnant female dogs, and the puppies often have symptoms such as loose stools, dyspnoea and movement disorders.

b. Clinical Symptoms of Toxoplasmosis

- Acute Cases – Pneumonia symptoms, persistent high fever, anorexia, lethargy, shortness of breath, cough, etc. There have also been cases of encephalitic symptoms, premature births and miscarriages.
- Chronic Toxoplasmosis Often Reoccurs – Anorexia, central nervous system disorder, myocardial disease, liver injury, miscarriage or stillbirth, as well as fever after antibiotic treatment, dyspnoea before death.
- Iritis occurs in some acute and chronic diseased cats.

c. Laboratory Diagnosis of Toxoplasmosis

There are three commonly used methods for diagnosing Toxoplasma gondii infection:

1) Etiological diagnosis, such as microscopic examination, trophozoite isolation method, etc. However, the inspection method is time-consuming, laborious and the specificity and sensitivity are not high, which often leads to missed or wrong diagnosis.
2) Molecular biology diagnosis, such as methods developed on the basis of molecular hybridisation technology, DNA in vitro amplification technology (polymerase chain reaction, etc.), such as needle control technology, immune PCR, nested PCR, etc. Although it has high sensitivity and specificity, it is difficult to popularise and apply due to its complicated operation or high requirements of experimental conditions.
3) Immunological diagnosis, such as ELISA, complement fixation test, western blot and immunochromatography and other methods. Immunological diagnostic methods are a routine method for the investigation of toxoplasma infection and the screening and diagnosis of clinical toxoplasmosis. It has the advantages of high sensitivity, strong specificity, simple and fast operation, etc. diagnostic tool.

c. Immunological Diagnosis

- Indirect Haemagglutination Assay (IHA) – The principle is based on the specific combination of antigen and antibody. The method has the characteristics of simple operation, small volume, quick, specificity and low cost. It is suitable for auxiliary diagnosis and large-scale epidemiological investigation. It is also one of the most commonly used methods in domestic laboratories. However, IHA has the disadvantage of low sensitivity and generally cannot reflect current infection.

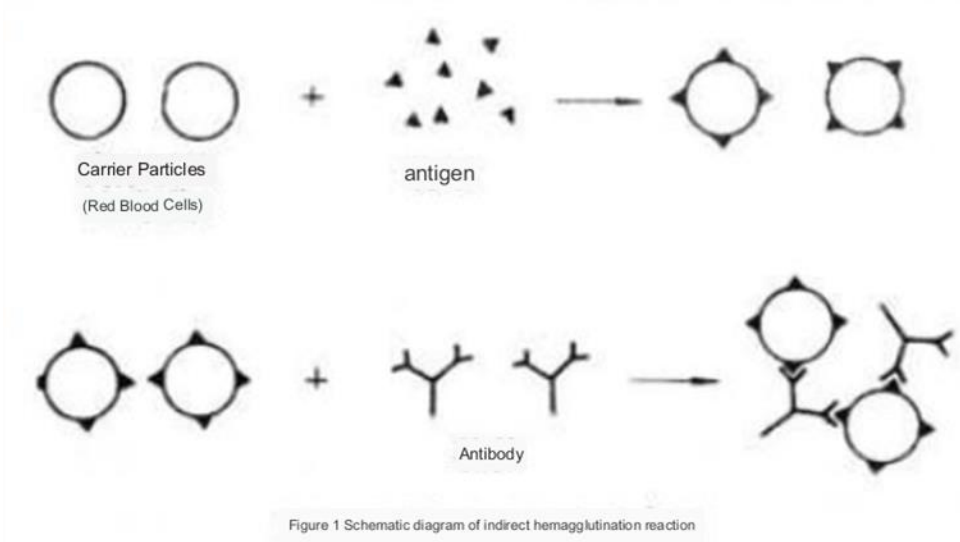
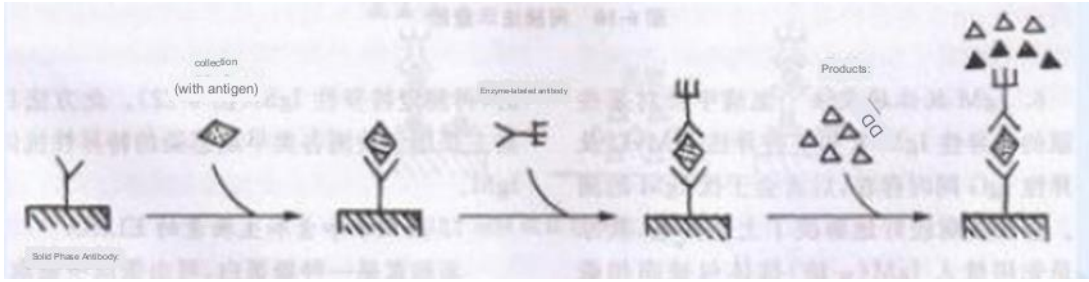


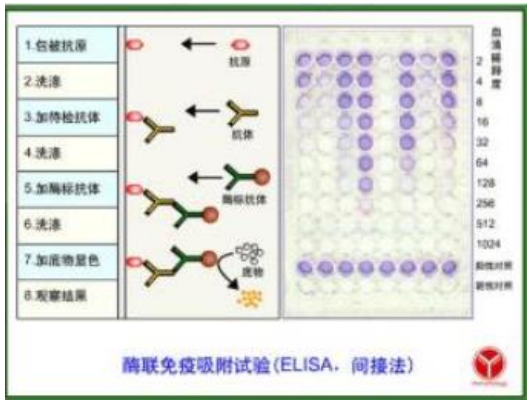
Figure 1 Schematic diagram of indirect hemagglutination reaction

c. Immunological Diagnosis

- Enzyme-Linked Immunosorbent Assay (ELISA) – ELISA can detect anti-toxoplasma IgM, IgA, IgG, IgE antibodies and C antigen (circulating antigen). A lot of research has been done on the diagnosis of toxoplasmosis by ELISA and a variety of methods have been derived, such as indirect ELISA, PPA-ELISA (Staphylococcus aureus protein A-enzyme-linked immunosorbent assay), ABC-ELISA (biotin-affinity oxide enzyme-linked immunosorbent assay), BA-ELISA (avidin biotin ELISA), Dot-ELISA (dot enzyme-linked immunosorbent assay), double sandwich ELISA, etc.



Double Antibody Sandwich ELISA



Indirect ELISA

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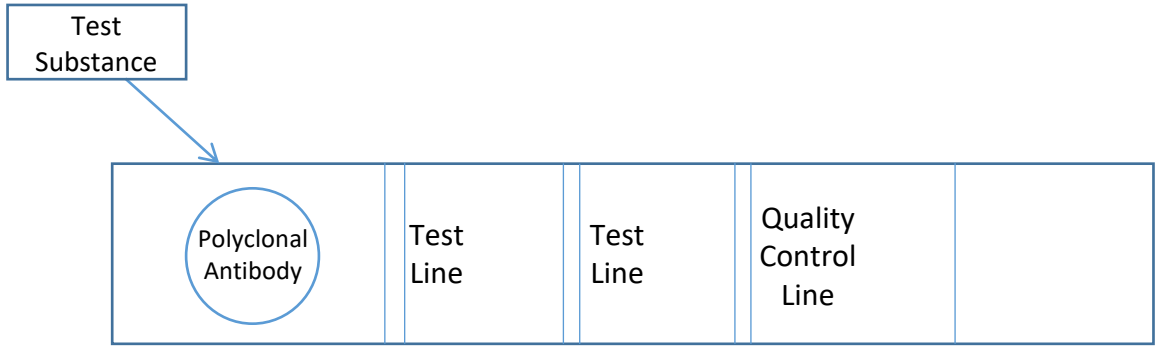
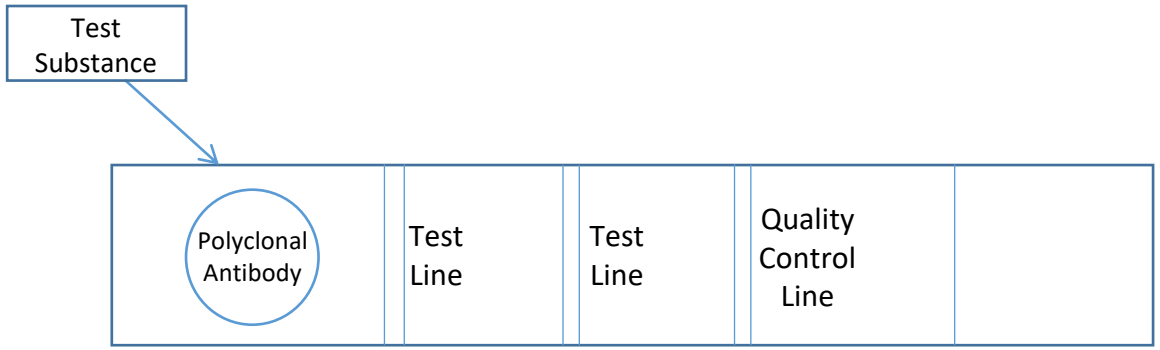
c. Immunological Diagnosis

- Indirect Fluorescent Antibody Test (IFAT) – The intact Toxoplasma gondii was used as the antigen and the fluorescently labelled secondary antibody was used to detect IgM and IgG. IFAT has the advantages of simplicity, quick, sensitivity, specificity and strong reproducibility. It detects the specific antibodies IgM and IgG of the surface membrane antigen of Toxoplasma gondii.



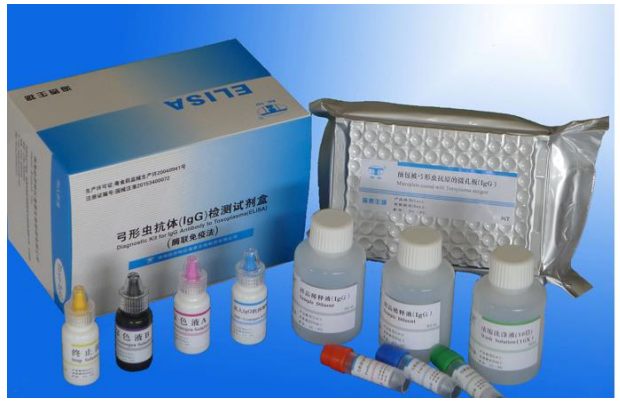
c. Experiment Plan

1) Method – Indirect Fluorescent Antibody Test (IFAT)
2) Operation Steps:
   - Labelled secondary antibody (polyclonal antibody)
   - Antigen 1+antigen 2 coating
   - Antibody test
   - Clinical testing
   - Repeatability test
   - Stability test



d. Market Analysis

- Most of the products on the market are based on human testing and the methodology is ELISA.



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Conclusion

- Research on companion animal toxoplasmosis is still in its early days. It is necessary to strengthen the investigation and research of companion animal toxoplasmosis, grasp the epidemic law of toxoplasmosis, and establish a new detection technology suitable for environmental pollution assessment and pet toxoplasmosis diagnosis. With the in-depth research on the molecular biology and epidemiology of Toxoplasma gondii etiology, the continuous development of Toxoplasma gondii detection technology and vaccine research, there will be further understanding of the infection route and prevention strategies of Toxoplasma gondii, and its infection rate is expected to gradually decrease.

References

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InSight V-IA®

Toxo Ab
Rapid Quantitative Test

Woodley have developed a rapid, accurate, reliable and highly sensitive detection method for Toxo Ab in cats and dogs.

The InSight V-IA Toxo Ab Rapid Quantitative Test is a fluorescence immunoassay used with the InSight V-IA Veterinary Immunoassay Analyser for the quantitative determination of Toxoplasma Gondii Ab in cats and dogs.

It can be stored at room temperature.

Thank You

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