

Protists and Human Disease

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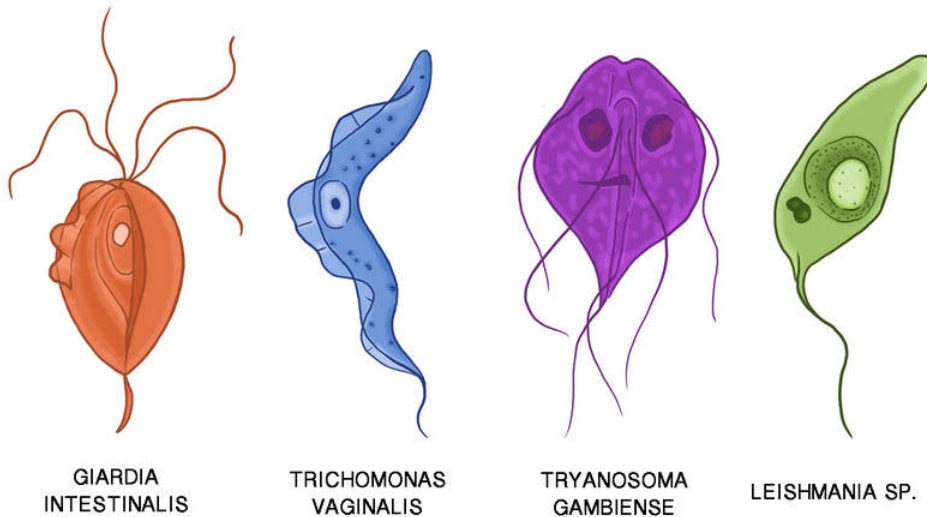
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CHAPTER 1

Protists and Human Disease

- Give examples of diseases caused by protists.
- Explain how *Trypanosoma* and *Plasmodium* cause disease.
- Describe giardiasis.



Can such little creatures make you sick?

They sure can. Not all of them, but some of them. And without proper medical treatment, the person may never recover.

Protists and Human Disease

Most protist diseases in humans are caused by animal-like protists, or **protozoa**. Protozoa make us sick when they become human **parasites**. Three examples of parasitic protozoa are described below.

Members of the genus *Trypanosoma* are flagellate protozoa that cause **sleeping sickness**, which is common in Africa. They also cause **Chagas disease**, which is common in South America. The parasites are spread by insect vectors. The vector for Chagas disease is shown in **Figure 1.1**. *Trypanosoma* parasites enter a person's blood when the vector bites. Then they spread to other tissues and organs. The diseases may be fatal without medical treatment.

The discovery of Chagas disease is unique in the history of medicine. That's because a single researcher—a Brazilian physician named Carlos Chagas—single-handedly identified and explained the new infectious disease. In the early 1900s, Chagas did careful lab and field studies. He determined the pathogen, vector, host, symptoms, and mode of transmission of the disease that is now named for him.

**FIGURE 1.1**

Vector for Chagas Disease. In Chagas disease, the *Trypanosoma* parasite is spread by an insect commonly called the “kissing bug.” A bite from this bug could be the kiss of death.

Giardia are flagellate protozoa that cause **giardiasis**. The parasites enter the body through food or water that has been contaminated by feces of infected people or animals. The protozoa attach to the lining of the host’s small intestine, where they prevent the host from fully absorbing nutrients. They may also cause diarrhea, abdominal pain, and fever. A picture of a *Giardia* protozoan opens this concept.

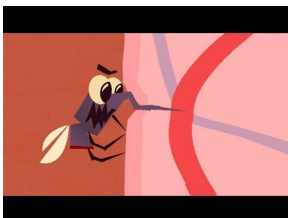
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Plasmodium protozoa cause **malaria**. The parasites are spread by a mosquito vector. Parasites enter a host’s blood through the bite of an infected mosquito. The parasites infect the host’s red blood cells, causing symptoms such as fever, joint pain, anemia, and fatigue.

Malaria is common in tropical and subtropical climates throughout the world (see **Figure 1.2**). In fact, malaria is one of the most common infectious diseases on the planet. Malaria is also a very serious disease. It kills several million people each year, most of them children. A vaccine to malaria is a possibility.

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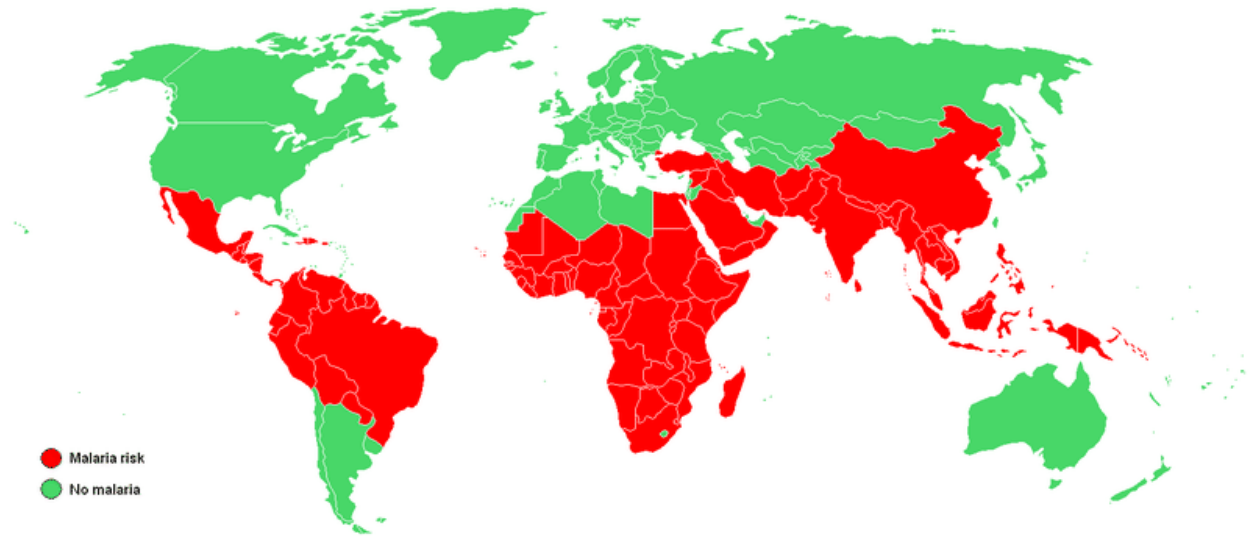


FIGURE 1.2

Worldwide Distribution of Malaria. This map shows where malaria is found. The area is determined by the mosquito vector. The mosquito can live year-round only in the red-shaded areas.

Summary

- Most protist diseases in humans are caused by protozoa. Protozoa make humans sick when they become human parasites.
- *Trypanosoma* protozoa cause Chagas disease and sleeping sickness.
- *Giardia* protozoa cause giardiasis, and *Plasmodium* protozoa cause malaria.

Review

1. Describe how the protozoa that cause Chagas disease are spread to human hosts.
2. State why malaria is commonly found only in tropical and subtropical regions of the world.
3. Terri lost her water bottle while hiking in Canada. It was a hot day, so she drank water from a stream to stay hydrated. A few days later, Terri became ill with abdominal pain, fever, and diarrhea. Her doctor thinks she has a protozoan infection. Which type of protozoa do you think is most likely responsible for Terri's illness? How do you think Terri became infected?

References

1. Courtesy of the Centers for Disease Control and Prevention. <http://www.cdc.gov/parasites/insects.html> . Public Domain
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