

**CHAPTER 14**  
**PARASITIC AND FUNGAL**  
**INFECTIONS**

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**PARASITES AND THEIR**  
**INFECTIONS**

- ◆ Parasites can be protozoans or helminths (although not all protozoans and not all helminths are parasites)
- ◆ Parasitic infections affect hundreds of millions of people throughout the world and cause millions of deaths each year
- ◆ There are three classes of helminth that infect humans: nematodes (roundworms), cestodes (tapeworms), and trematodes (flukes)

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**PARASITES AND THEIR**  
**INFECTIONS**

- ◆ Some parasites have a life cycle that involves a single host, whereas others use more than one host
- ◆ Pathogenic mechanisms for both protozoan and helminthic infections vary and depend on the specific parasite

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### EXAMPLES OF PROTOZOAN INFECTIONS

- ◆ Protozoan parasitic diseases include malaria, toxoplasmosis, amebiasis, trichomoniasis, and trypanosomiasis
- ◆ Protozoan parasites may use humans as an intermediate host and another animal as their definitive host

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### EXAMPLES OF PROTOZOAN INFECTIONS

- ◆ Malaria (caused by *Plasmodium* species) is spread by the bite of *Anopheles* mosquitoes
- ◆ Toxoplasmosis (caused by *Toxoplasma gondii*) is spread by housecat feces
- ◆ Amebiasis (caused by *Entamoeba histolytica*) is acquired by ingestion of fecal-contaminated water

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### EXAMPLES OF PROTOZOAN INFECTIONS

- ◆ Trichomoniasis (caused by *Trichomonas vaginalis*) is a sexually-transmitted disease
- ◆ Trypanosomiasis (caused by *Trypanosoma* species) is spread by the bite of tsetse flies and kissing bugs

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### EXAMPLES OF HELMINTHIC INFECTIONS

- ◆ Nematodes (roundworms) cause tissue, blood, and lymph infections and can be caused by intestinal nematodes, such as *Enterobius* and *Ascaris*, or by tissue nematodes, such as *Trichinella spiralis*
- ◆ Cestodes (tapeworms) are the largest intestinal parasites and have a scolex, which incorporates both muscular sucking disks and in some cases attachment hooks called a rostellum
- ◆ Trematodes (flukes) can infect the blood, liver, and lungs

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### FUNGAL INFECTIONS

- ◆ Fungi are mostly harmless free-living or commensal organisms that cause no problems for humans
- ◆ Fungi are eukaryotes that have the sterol ergosterol incorporated in their plasma membrane and the polysaccharides mannan, glucan, and chitin in their cell walls

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### FUNGAL INFECTIONS

- ◆ Fungi are heterotrophic, metabolically diverse, and either aerobic or facultatively anaerobic
- ◆ Fungi reproduce either sexually or asexually

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## FUNGAL INFECTIONS

- ◆ Fungal growth can be in a mold or yeast form, but some fungi are dimorphic and can grow in either form depending on the environmental conditions
- ◆ Medically important fungi can be distinguished by their morphology or ribosomal RNA typing

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## FUNGAL INFECTIONS

- ◆ Medically important fungi can be divided into four categories of mycoses (diseases caused by fungi)
- ◆ Superficial mycoses do not involve tissue responses and include infection of the hair shafts and superficial skin
- ◆ Mucocutaneous mycoses are associated with the skin, eyes, sinuses, oropharynx, external ears, or vagina

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## FUNGAL INFECTIONS

- ◆ Subcutaneous mycoses are localized infections of the subcutaneous tissues
- ◆ Deep mycoses can be localized or systemic, and are usually restricted to patients who are immunocompromised
- ◆ The pathogenesis of fungal infections involves adherence, invasion, and tissue injury

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