**Overview of Antifungal Agents**

Pathogenic fungi affecting animals are eukaryotes, generally existing as either filamentous molds (hyphal forms) or intracellular yeasts. Fungal organisms are characterized by a low invasiveness and virulence. Factors that contribute to infection include necrotic tissue, a moist environment, and immunosuppression. Fungal infections can be primarily superficial and irritating (eg, dermatophytosis) or systemic and life threatening (eg, blastomycosis, cryptococcosis, histoplasmosis, coccidioidomycosis). Dimorphic fungi, which grow in the host as a yeast-like form but as molds in vitro at room temperature, include *Coccidioides immitis*, *Histoplasma*, and *Rhinosporidium*, which grow inside host cells.

The fungal cell wall is rigid and contains chitin, which along with polysaccharides, acts as a barrier to drug penetration. The cell membrane contains sterols such as ergosterol, which influences the efficacy and the potential risk of resistance to some drugs. *Cryptococcus* and occasionally *Sporothrix schenckii*produce an external coating or slime layer that encapsulates the cells and causes them to adhere and clump together.

Several factors can lead to therapeutic failure or relapse after antifungal therapy. Most antifungal agents are fungistatic in action, with clearance of infection largely dependent on host response. Several organisms, particularly the superficial pathogens and systemic opportunistic organisms, have a primary resistance to antifungal drugs. In some instances, therapeutic failure reflects poor penetration of drug into infected tissues (particularly the CNS and bone) or into those organisms that are encapsulated. Toxicity of antifungals is a common cause of therapeutic failure. Because both the antifungal target organism and the host cells are eukaryotic, the cellular targets of fungal organisms are often similar to the host structures. Discontinuing therapy after resolution of clinical signs but before eradication of infection also leads to therapeutic failure. Therapy should extend well beyond clinical cure.

SOURCE: <http://www.merckmanuals.com/vet/pharmacology/antifungal_agents/overview_of_antifungal_agents.html>