Antifungal Resistance and New Strategies to Control Fungal Infections

Despite improvement of antifungal therapies over the last 30 years, the phenomenon of antifungal resistance is still of major concern in clinical practice. In the last 10 years the molecular mechanisms underlying this phenomenon were extensively unraveled. In this paper, after a brief overview of currently available antifungals, molecular mechanisms of antifungal resistance will be detailed. It appears that major mechanisms of resistance are essential due to the deregulation of antifungal resistance effector genes. This deregulation is a consequence of point mutations occurring in transcriptional regulators of these effector genes. Resistance can also follow the emergence of point mutations directly in the genes coding antifungal targets. In addition we further describe new strategies currently undertaken to discover alternative therapy targets and antifungals. Identification of new antifungals is essentially achieved by the screening of natural or synthetic chemical compound collections. Discovery of new putative antifungal targets is performed through genome-wide approaches for a better understanding of the human pathogenic fungi biology.