Novel Anti fungal Azole Compounds and Combination Treatments - 2139 and 2181

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Technology description

Overview

The global antifungal drugs market size was valued at USD 10.7 billion in 2015 and is expected to grow. As the number of hospitalized patients continue to rise, fungal infections are also spreading at an escalating rate. Fungi infect not only humans, but also various food sources that can indirectly spread to humans. Drugs for systemic antifungal treatment are available via intravenous or oral administration, and azoles are often the treatment of choice based on their excellent bioavailability and cost.

There is currently an unmet medical need for new and more effective treatments for fungal infections due to factors such as increased incidence, limited efficacy of current therapy, increasing drug resistance, and toxicities associated with current treatments. Fungal pathogens are the major cause of opportunistic infections, in medical device procedures (I.E. stents, artificial valves, and pacemakers) as well as those that are immune-compromised, such as HIV patients or those undergoing cancer treatment. Despite wide spread occurrence and the tremendous economic and healthcare burdens associated with widespread fungal infections, only a small number of antifungal treatments exist in clinic.

Invention

Researchers at the University of Kentucky have developed novel azole-based treatments for difficult to treat fungal infections. These treatments have shown antifungal activity against azole-resistant fungal strains in vitro, and have the potential to be candidates for human clinical trial testing.

Furthermore the researchers have developed a library of synergistic combinations of non-antifungal drugs to combine with azole antifungals to improve efficacy when treating both azole-sensitive and azole-resistant fungal infections. The non-antifungal drugs include both antipsychotics (i.e. bromperidol) and antihistamines, as well as their respective analogs. These combinations address the concern of azole-induced toxicity and other adverse events by reducing the quantity of azole required to achieve an equivalent antifungal effect.

Fungal infections are known to develop resistance to commonly used azoles that are in use in the clinic today. There remains a need for an effective and safe alternative to treating drug-resistant fungal strains in both humans and plants, and this technology addresses this critical point as an efficacious azole-based therapy which can treat drug resistant fungal infections.

Azoles are also known to cause toxicity in several organ systems, and have many drug-drug

interactions. Due to this and the potential drug resistance, there is a need for an effective, safe and novel combination treatments to combating fungal infections in both humans and plants.
Professor of Pharmaceutical Sciences, College of Pharmacy, who has contributed to and/or published approximately 140 papers and 8 patents.

Advantages

• Provides a novel means of treating strains of fungal microbes already resistant to approved azoles.
• Potential for fewer side effects associated with commonly used therapies.
• Opportunity to co-administer with current agents in use in the clinic today.
• Combination treatments may solve the inability for azole antifungals to sufficiently inhibit azole-resistant fungal pathogens.
• Combination treatments have the potential to alleviate azole-induced adverse events.

Institution

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