

EDITORIAL

New Drugs and Therapeutic/Diagnostic Targets for Fungal and Parasitic Diseases - Part I

Infectious diseases are caused by bacteria, viruses, fungi and parasites and are one of the leading causes of human morbidity and mortality, being also responsible for huge economic losses in the livestock industry. Among the control measurements of infectious diseases are the correct diagnosis and the adequate treatment of patients or/and asymptomatic carrier.

Unlike other pathogenic microorganisms, parasites and fungi are eukaryotic organisms, so their cells are very similar to human/animals cells, making necessary to search and develop drugs without side effect of toxicity to the hosts cells.

The fungal and parasitic infections have a wide global distribution, however the therapeutic arsenal available in the XXI century remains extremely reduced, this problem is aggravated by the appearance of resistances to conventional treatments. Due to the indifference of pharmaceutical industry, non-profit organizations, such as universities or research centers, are doing an exhaustive effort in the identification of compounds with antiparasitic and antifungal activity. There are different approaches in the search for new drugs, such as high-throughput screening tests (HTS), which allow for the evaluation of thousands of different biological compounds through robotic systems, the identification of the mechanism of action and subsequent development of compounds with the same mechanism, or computer-aided design that includes structure-activity studies or virtual screening, among others.

On the other hand, the complexity of the host-parasite system makes that compounds with a good activity *in silico* and *in vitro* models do not correlate with good efficacy *in vivo*, either because they do not reach the parasite *per se* (many parasites are intracellular or are anatomically isolated) or because the parasite has different forms with different responses to the compound, which makes more difficult the number of compounds that enter in clinical trials.

On the other hand, these pathogens have accompanied mankind since many years and hence, there are numerous ethno-pharmacological and ethno-botanical data that support the use of different plants in the treatment of the infections produce by parasites and fungi. Some of them are collected in traditional Chinese medicine, Ayurvedic or in the traditions of various indigenous groups from different parts of the world. Due to the difficulty of accessing conventional drugs in many developing countries, WHO has included among health strategies the incorporation of traditional medicine (complementary and alternative) to health systems, as long as there are clinical investigations that guarantee its safety and efficacy.

In this respect, this CTMC thematic issue includes extensive reviews related to the natural, conventional and advanced pharmacological treatments of various fungal and parasitic infections.

Passero *et al.*, reviewed several studies to understand how active products obtained from plants can be used in the treatment of leishmaniosis, with special emphasis on those from Brazil.

Vivancos *et al.*, make an extensive revision about the treatment of *Giardia intestinalis*, from conventional pharmacological treatments to the use of medicinal plants, probiotics and new formulations with the aim to reduce the appearance of resistance and toxicity.

Several parasites are responsible for diseases in livestock and involve large economic losses, Sanchez-Sanchez *et al.*, examine the different measures applied in the control of *Toxoplasma* and *Neospora*, responsible for abortions in livestock with special emphasis on chemotherapeutical guidelines taking into account the different stages of the parasite and the safety for the final consumer.

Candida is a part of our habitual microbiota, however in certain circumstances it can behave like an opportunistic pathogen, generating from skin and mucous infections to serious invasive forms.

González-Burgos & Gómez-Serranillos analyze clinical evidence on the effectiveness of natural products in the vulvovaginal candidiasis, including essential oils, honey and yogurt or plant extracts.

Finally, Tabora *et al.*, focuses on two of the most important systemic mycoses, paracoccidioidomycosis and histoplasmosis, and their major characteristics in epidemiology, clinical aspects, treatment and laboratory diagnosis.

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(Guest Editor)

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