1. Record Nr. UNINA9910261144603321

Autore	Anjan Debnath
Titolo	Drug Development for Parasite-Induced Diarrheal Diseases
Pubbl/distr/stampa	Frontiers Media SA, 2017
Descrizione fisica	1 online resource (177 p.)
Collana	Frontiers Research Topics
Soggetti	Microbiology (non-medical)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia

Sommario/riassunto

One of the top four contributors to the global burden of disease is diarrheal infections. Intestinal parasites are major causes of morbidity and mortality associated with diarrheal diseases in both the developed and developing world. Amebiasis is responsible for 50 million cases of invasive disease and 70,000 deaths annually in the world. Giardiasis has an estimated worldwide prevalence of 280 million cases annually. In developed countries, Giardia lamblia infects about 2% of adults and 6-8% of children. The prevalence of G. lamblia infection is generally higher in developing countries, ranging from 3% to 90%. Furthermore, giardial infections contribute substantially to the 2.5 million annual deaths from diarrheal disease. In Asia, Africa, and Latin America, about 500,000 new giardiasis cases are reported each year. Cryptosporidium accounts for 20% and 9% of diarrheal episodes in children in developing and developed countries, respectively. Infection with Cryptosporidium can be chronic and especially debilitating in immunosuppressed individuals and malnourished children. A recent study to measure disease burden, based on disability-adjusted life years (DALYs), found that cryptosporidiosis and amebiasis produce about 10.6 million DALYs. This exceeds the DALYs of any helminth infection currently being targeted by the World Health Organization for preventive chemotherapy. Because of its link with poverty, Giardia and Cryptosporidium were included in the WHO Neglected Diseases Initiative in 2004. E. histolytica, G. lamblia, and C. parvum have been

listed by the National Institutes of Health (NIH) as category B priority biodefense pathogens due to low infectious dose and potential for dissemination through compromised food and water supplies in the United States. Despite the prevalence of amebiasis, giardiasis, and cryptosporidiosis there are no vaccines or prophylactic drugs. The first-line drugs for invasive amebiasis and giardiasis chemotherapy are nitroimidazoles, with the prototype, metronidazole, being the most common drug used worldwide. Metronidazole has been shown to be both mutagenic in a microbiological system and carcinogenic to rodents, and frequently causes gastrointestinal side effects. In spite of the efficacy of nitroimidazole drugs, treatment failures in giardiasis occur in up to 20% of cases. Clinical resistance of G. lamblia to metronidazole is proven and cross resistance is a concern with all commonly used antigiardial drugs. Nitazoxanide, the only FDA-approved drug for the treatment of cryptosporidiosis, is effective in the treatment of immunocompetent patients and partially effective for immunosuppressed patients. Therefore, it is critical to search for more effective drugs to treat amebiasis, giardiasis, and cryptosporidiosis. This Research Topic for Frontiers in Microbiology will explore the recent progress in drug development for parasitic diarrheal diseases. This includes an understanding of drug resistance mechanisms. We would also welcome submissions on the drug development for other diarrheal parasites. We hope that this research topic will include a comprehensive survey of various attempts by the parasitology research community to create effective drugs for these diseases.