

HELMINTH PARASITE CONTROL IN THE AGE OF DRUG RESISTANCE: WHERE ARE WE?

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Billions of people are infected with parasitic helminths. These infections are also of major concern in animals, causing morbidity, affect food production, a source of zoonotic infections; affect the environment and animal welfare. Powerful anthelmintics are employed to reduce morbidity. In recent years, donations of millions of doses of anthelmintics, coupled with treatment support from governments and charities, has led to the largest mass drug administration programs in the world, directed against helminth infections in people. The goals of recurrent drug administration programs is to reduce deaths and morbidity, then to reduce transmission and the incidence of infection, and ultimately to eradicate the parasites. Only a small number of anthelmintics are used in large-scale programs. Treatments are not always curative, but temporarily reduce morbidity and transmission, and people and animals become re-infected. Treatment is often needed year after year. While these control programs improve health, they also impose selection pressure for drug resistance. We see widespread resistance to anthelmintics such as the benzimidazoles (e.g. albendazole) and avermectins (e.g. ivermectin) in nematode parasites of farm animals, as well as in new anthelmintics, such as monepantel. Recently, we are seeing evidence of resistance developing in human *Onchocerca volvulus* (causing river blindness) and human whipworms, *Trichuris trichiura*, as well as in *Dirofilaria immitis*, the heartworm parasite in companion animals. There is concern about anthelmintic resistance being selected in other soil transmitted helminths and schistosomes. On the other hand, the interest of the world health community to control these diseases and the real risk of resistance developing, are spurring efforts to find new therapies and to make better use of existing anthelmintics. This renewed effort is aided by tremendous advances in genomics and understanding the molecular physiology of helminths, and by more public-private partnerships seeking new treatments and better control practices.



Biography

Roger K Prichard has completed his PhD in 1969 at University of NSW, Australia. He was a Postdoctoral Fellow at University College, Wales, Aberystwyth, UK. He is currently James McGill Professor of Parasitology, McGill University, Canada. He was awarded with many Honours and Awards: Docteur *Honoris causa*, Université Paul Sabatier, France; Honorary Life Member, World Assoc Advancement Vet Parasitol (WAAVP); WAAVP/ Bayer Teaching Award; Fellow, Australian Social Parasitologist; Honors Diplomate, European Veterinary Parasitology College; WAAVP/Pfizer Research Award; Distinguished Vet. Parasitologist, Amer. Assoc. Vet. Parasitologist; Wardle Medal, Canadian Society Zoologists; *International Recognition*: Member, Helminth Disease Group, WHO; Helminth Drug Initiative Task Force, WHO; Advisory Comm, Children without Worms; Expert Advisor, Soil Transmitted Helminth, B&M Gates Foundation; Expert Advisory Committee, WHO Onchocerciasis Control Programme; President, WAAVP; President, AAVP; Vice-President (Research) and Dean Graduate Studies, McGill; Director, Institute of Parasitology, McGill. He has 291 publications; seven patents; Google Scholar *h-index* 65. His research is on optimizing pharmaceuticals against parasites, drug resistance.

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