

Researchers closing in on safe treatment for parasitic diseases

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Anti-filarial drugs are distributed as part of a mass program in Tanzania, where MSU's Charles Mackenzie is working to develop new treatment methods for parasitic diseases. Credit: MSU University Relations

With the help of another \$2 million in funding from the Bill & Melinda Gates Foundation, researchers are moving closer to setting up human clinical trials for a reformulated drug that could be the linchpin of treatment efforts against two debilitating tropical diseases.

Charles Mackenzie, a professor of veterinary pathology in Michigan

State University's College of Veterinary Medicine, and his colleagues are looking to flubendazole, a drug tested first in the 1980s to treat the filarial disease river blindness (onchocerciasis).

The disease, in which the skin and eyes are infected with parasitic worms, afflicts about 40 million people worldwide, much of its damage in equatorial Africa. River blindness is spread by black flies, and after the parasitic worms die in a person's eye, it can cause blindness and debilitating skin disease.

Another filarial disease, elephantiasis (lymphatic filariasis), is caused by tiny worms in the vascular system and is spread via mosquitoes. It results in severe swelling of the legs, arms and torso, and the physical deformities and disabilities cause tremendous psychological problems and economic hardship to millions of people in most of the tropical regions of the world.

Researchers are focusing treatment efforts on flubendazole, a drug used in the 1980s with good results against adult filarial worms when it was injected in animals and humans. However, the injections caused severe local reactions and the drug formulation at that time gradually lost effectiveness. Mackenzie and colleagues are now reformulating the drug to develop new ways to safely administer it.

"Although flubendazole faces important challenges with regard to safety, the potential benefits that could result relatively quickly from a safe, usable formulation make this a top priority for the filarial world today," he said.

With the new funding, Mackenzie and his team will continue to research the drug and test it in infection models. Next will come the standard safety testing needed to register a drug for human use, and after about two years, Mackenzie hopes, clinical trials will begin.

"We need to assess the safety profile of flubendazole in pre-clinical studies to further reformulate it and develop a safe, effective and field-adapted drug candidate," he said. "This drug is the only drug candidate on the horizon that has demonstrated positive results."

Mackenzie was awarded the funding as part of a larger \$6 million grant given to DNDi, a Geneva-based nonprofit research-and-development organization. Timothy Geary from McGill University in Quebec, Canada, continues to work with Mackenzie on the project, which received \$2 million in funding from the Gates Foundation in February 2010. The MSU-led team will include a number of global collaborators, including Carlos Lanusse in Argentina, Samuel Wanji in Cameroon and Rob Eversole at Western Michigan University.

Mackenzie has been studying filarial diseases for more than 30 years and has done extensive work in Tanzania and Ecuador. DNDi, which stands for Drugs for Neglected Diseases initiative, was established in 2003 with the help of seven major global health organizations to focus on neglected diseases affecting the world's poor. For more information, go to www.dndi.org.

Provided by Michigan State University

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