> **“Sometimes I cry all night, sometimes from suffering, sometimes from misery, and sometimes from poverty... my heart hurts from my lack of hope. I live a life of suffering.”**

Gertride Mapuani, *a 61-year-old with river blindness, divorced and thrown out of her house by her husband because of the disease, in Babagulu village, Democratic Republic of Congo.*

FILARIAL DISEASES

DEVELOPING A RAPID CURE FOR MILLIONS AT RISK OF BLINDNESS

Filarial diseases such as river blindness, loa loa, and lymphatic filariasis are caused by parasitic nematode worms transmitted by the bite of blood-sucking insects. These diseases are not usually fatal, but they inflict hardship and misery on millions of people, causing life-long disabilities such as blindness, severe itching, dermatitis, or swollen limbs and genitals.

31 COUNTRIES
Onchocerciasis, or river blindness, is endemic in 31 African countries. Over 21 million people are infected.

65 MILLION
Lymphatic filariasis, or elephantiasis, is endemic in 54 countries worldwide and over 65 million people are infected.

10 COUNTRIES
Loa loa or African eye worm is endemic in 10 countries in West and Central Africa.

THE TREATMENT CHALLENGE

The drug commonly used to prevent river blindness in affected communities is not as effective for treating the disease because it only kills the juvenile worms, not the adult worms. In some regions the current drug can also cause a potentially fatal inflammatory reaction in people co-infected by both river blindness and loa loa.

DND*i* aims to deliver a safe, effective, affordable, and field-adapted drug that can kill adult filarial worms (a 'macrofilaricide') and be used for prevention or individual treatment.

Three drug candidates in development for river blindness

In 2018, early (Phase I) studies in healthy volunteers for two potentially macrofilaricidal drugs, emodepside and TylAMac, were successfully completed. Emodepside originates from the Japanese pharmaceutical company Astellas and is currently commercialized by Bayer Animal Health as a veterinary drug. It is now being developed by DND*i* and Bayer as a new macrofilaricidal treatment for humans. DND*i* and AbbVie are developing TylAMac to target the *Wolbachia* bacteria that have an endosymbiotic relationship with the worms that cause river blindness. Targeting the *Wolbachia* bacteria kills the worms gradually over a long period of time, resulting in fewer side effects for patients. Phase II clinical studies for both drugs are being planned in West and Central Africa.

A third drug, oxfendazole, which is already used for deworming in animals and is under development for the treatment of two other diseases, may also hold promise for filarial diseases in humans. Taking advantage of pre-clinical work already available in the public domain, DND*i* is moving ahead with early clinical trials of oxfendazole as a macrofilaricidal treatment for filarial diseases.

Epilepsy and onchocerciasis – a link?

For decades, researchers in Latin America and Africa have noted that many patients in rural areas affected by onchocerciasis also had what seemed to be epilepsy. Researchers have recently suggested that the worms that cause river blindness may also cause an auto-immune reaction that damages the nervous system.

DND*i* participated in the first international workshop on onchocerciasis-associated epilepsy (OAE) held in Antwerp, Belgium, in October 2017 and is a member of the newly created OAE Alliance. Research to confirm a scientific explanation is underway. The possible association between the two diseases highlights the urgent need for new treatments to alleviate the suffering of affected people.