In 2000, African Presidents committed themselves to the eradication of tsetse and trypanosomiasis, marking a turning point in the fight against a disease that devastates agriculture and human health in Africa. The African Union has since been mobilizing action towards this goal, but their efforts have been constrained by inefficient diagnostic and therapeutic tools.

The EU is funding NANOTRYP, a consortium of European (VIB – Belgium, FIBAO – Spain, FIND – Switzerland and ARTTIC – Belgium) and African (IPR – Kenya and EUM – Mozambique) partners to exploit nanobodies in developing novel diagnostics and treatments for African trypanosomiasis. Nanobodies, as the name suggests, are extremely tiny molecules and are fragments of standard antibodies. They possess unique features that enable them to bind targets that are not accessible to standard antibodies. The project includes training and transfer of this technology to African partners, and disease awareness campaigns in endemic countries.

Human African trypanosomiasis (HAT) is a fatal, neglected and stigmatizing disease common to poor rural communities. More than 60 million people are under constant risk of infection, and livestock and wildlife are reservoirs of the disease. Animal African trypanosomiasis (AAT) severely impacts agriculture, with 3 million out of 50 million cattle that are kept in tsetse infested areas dying every year, while 35 million doses of drugs are used in treatment. Its economic cost is approximately US$4.75 billion/year, with less discernible, but equally important, socio-cultural and food insecurity repercussions.

Since none of the diagnostic tests for HAT and AAT is currently performed without using an instrument, NANOTRYP will develop an innovative dipstick test based on the special characteristic of nanobodies, thus eliminating the need for any equipment.

In the search for novel treatment, nanobody-targeted delivery of drugs and other anti-trypanosome agents will be explored, including cyclodextrin-controlled drug delivery methods and neuropeptides. Preclinical evaluation of the nanobody technology in diagnosis and treatment will be done using non-human primate models of HAT.

The project’s access strategy, which will guarantee sustained availability of the technology, includes advocacy and awareness campaigns at international, national, and community levels, emphasizing the role played by livestock in epidemiology of HAT, the need to include animal trypanosomiasis in HAT control programs, and for governments to allocate adequate resources for such programs. Diagnostics development companies are also being lobbied to manufacture tests at affordable prices, and communities continually sensitized that early diagnosis leads to safer and more effective treatment.

This four-year EU/FP7 initiative will demonstrate the value of nanotechnology in combating diseases of man and livestock.

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‘‘For three months, I was coughing, complaining of swollen legs and persistent headaches’’

This picture was taken when an early diagnosis of sleeping sickness was made, indicating that with prompt diagnosis, patients can not only be treated when they are still looking healthy, but they also have a better chance of recovery.