
Hidden: how african trypanosomes remain transmissible

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Résumé

Trypanosoma brucei are protist parasites responsible for sleeping sickness (human) and nagana (cattle) in sub-Saharan Africa. Infective trypanosomes are exclusively transmitted by the bite of the tsetse fly and first develop in the blood and lymph as extracellular forms. In trypanotolerant people or during the chronic phase of an infection, parasitemia is usually very low. Furthermore, evidences for the existence of natural reservoir hosts for trypanosomes and for non-vectorial transmission routes remain scarce. Therefore, the persistence of trypanosome transmission in historical epidemiological foci remains enigmatic. In patients, a wide array of skin symptoms have been described and parasites were reported in the extravascular compartment in several models. Could these extravascular parasites be involved in the maintenance of the transmission? In order to unravel their possible contribution, some mice were infected with red fluorescent and bioluminescent parasites and the infection was daily monitored by intravital imaging. After natural transmission, parasites were observed in the extravascular compartment before being detected in blood. Then, blood parasites remained barely detectable during the entire course of infection, whereas a population of parasites was continuously detected in the extravascular compartment with a dynamic distribution and in variable densities. These extravascular parasites were proved to be motile, to proliferate and to express markers of transmissible forms. Differential xenodiagnoses on infected mice allow us to confirm that these skin parasites were taken up by tsetse flies where they initiated a cyclical development. The role and significance of these extravascular parasites in the persistence of transmission is discussed.

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