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Loop-mediated isothermal amplification (LAMP) and its application for the detection of African trypanosomes

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While PCR is a method of choice for the detection of African trypanosomes in both man and animals, the expense of this method negates its use as a diagnostic method for the detection of African trypanosomosis in African countries where it is endemic. The loop-mediated isothermal amplification (LAMP) reaction is a method that amplifies DNA with high specificity, efficiency and rapidity under isothermal conditions using only simple incubators. An added advantage of LAMP over PCR-based methods is that DNA amplification can be monitored spectrophotometrically and/or with the naked eye, without the use of dyes. Here we present our conditions for a highly sensitive, specific and easy diagnostic assay based on LAMP technology for the detection of parasites of the *Trypanosoma brucei* group (including *T. b. brucei*, *T. b. gambiense*, *T. b. rhodesiense*, and *T. evansi*) and *T. congolense*. We show that the sensitivity of the LAMP-based method in detecting trypanosomes in vitro is up to 100 times higher than that of PCR-based methods in laboratory conditions. *In vivo* studies in mice infected with human-infective *T. b. gambiense* further highlight the potential clinical importance of LAMP as a diagnostic tool for identification of African trypanosomiasis.