# High levels of apoptosis in lymphocytes of individuals living in a malaria-endemic area

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The levels of spontaneous apoptosis of lymphocytes from four groups of healthy individuals have been evaluated in 3-day-old in-vitro cultures. The cell nuclei were stained with propidium iodide and the fluorescence quantified with a cytofluorometer. Under comparable culture conditions, the percentages of apoptotic nuclei were found to be significantly higher in lymphocytes from subjects living in an area holoendemic for malaria, with a high rate of parasite transmission, than in lymphocytes from subjects living in area where transmission is at a low level and seasonal.

The plasma concentration of soluble interleukin-2 receptor was also found to be higher in subjects from endemic areas than in other groups, indicating different levels of lymphocyte activation. The high level of spontaneous apoptosis found in some batches of lymphocytes *in vitro* could be associated with this cell activation. All other factors being comparable between the different groups of individuals, the most probable origin of such activation would be malarial infection. It is conceivable that the withdrawal of the lymphocytes from their natural environment to one apparently devoid of cytokines could also induce their death by apoptosis.

# Malaria transmission in a Tanzanian hospital

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Many patients hospitalized for long periods in Tanzania develop clinical malaria and nursing personnel regularly come down with malaria after working night shifts. In the Sumve district hospital (Mwanza), patients with tuberculosis, leprosy or femoral fractures and those in need of prostate surgery need over 2 weeks' hospitalization. The question was raised whether the malaria attacks they suffer because of hospitalization are the result of reduced immunity or of mosquito-borne transmission inside the hospital. As mosquitoes are, in any case, a nuisance in the wards, it was decided to study transmission.

From February–March 1994, 120 patients (mostly adults), all expected to be in hospital for a few weeks, were enrolled in the study. Most (100) were smear-negative at admission but 18 of these developed a parasitaemia after more than a week and nine of these had clinical signs of malaria. Mosquitoes were aspirated from all wards during the hospitalization of the subjects and the 1017 anophelines, all *Anopheles gambiae* s.l., were dried and examined by ELISA for *Plasmodium falciparum* sporozoite antigen. The proportions of sporozoite-antigen-positive anophelines varied with the ward in which collections were made. Overall, 48%, 43%, 40% and 29% of anophelines from the female, male, tuberculosis and children's wards were positive, respectively.

Transmission must therefore be an extremely frequent event inside the hospital and this, rather than subclinical parasitaemias, probably accounts for the vast majority of the observed attacks.