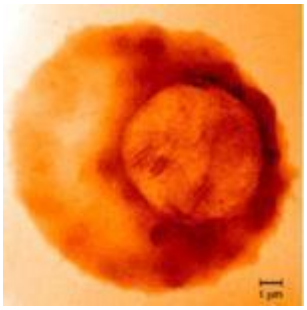
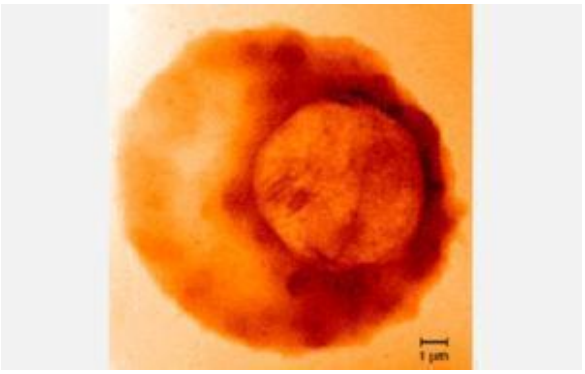
IL-10+ Th1 T cells associated with reduced malaria parasitemia





Malaria-infected human red blood cell (Lawrence Berkeley National Laboratory)

Researchers have observed a decline in symptomatic malaria with age and exposure to mosquitoes in a malaria endemic country. In spite of this individuals are still susceptible to asymptomatic Plasmodium falciparum (*Pf*) infection. CD4 T cells have been shown to be one of the major mediator of immunity to naturally acquired *Pf* infection and malaria vaccination. However, the exact role CD4 T cell mediated cytokine production and its association with malaria pathology remains poorly understood. Boyle *et al.* aimed to determine the cytokine profile Pf-specific CD4 T cell and determine what factors are associated with their function in children between

the ages of 6 months to 10 years from highly malaria-endemic region.

Boyle *et al*. observed that children who were uninfected with no parasitemia had significantly higher frequencies of *Pf*-specific CD4 T cells with increased proportion of multifunctional (IFNg±IL-10±) cells than asymptomatic *Pf* infected children. This cytokine co-expression profile is postulated to reduce immunopathology at the expense of reduced parasite clearance. Boyle *et al*. observed that IL-10 producing CD4+ T cells had significantly higher levels of T-bet and BLIMP-1 (transcription factor responsible for IL-10 production) than classical IFNg and TNFa producing Th1 cells. Illustrating that IL-10 producing cells are not T-regs and are of Th1 origin.

Additionally, Boyle *et al*. also observed age related differences in T cell function, where an in increase in the frequency of IFN-g+ *Pf*-specific CD4 T cells and a decrease in IL-10+ *Pf*-specific CD4 T cells with an increase in children's age. This was observed with concurrent decrease in parasite density with age. Suggesting a role of T cells in restricting parasite growth in these children, and preventing symptomatic disease.

In summary, Boyle *et al*. showed that CD4+ IL-10 producing *Pf*-specific T cells of Th1 origin are associated with reduced parasitemia in children from high malaria endemic countries. This suggests a role of IL-10+ Th1 T cells in natural immunity against symptomatic malaria infection.

Journal Article: Boyle, M.J. *et al.*, 2017. The Development of Plasmodium falciparum-Specific IL10 CD4 T Cells and Protection from Malaria in Children in an Area of High Malaria Transmission. Frontiers in Immunology, 8, p.1. DOI: 10.3389/fimmu.2017.01329.

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