

studies

1. Centre de Recherches sur les Trypanosomoses Animales (Burkina Faso)
2. Institut d'Elevage et de Médecine Vétérinaire des Pays Tropicaux (France)
3. International Centre of Insect Physiology and Ecology (Kenya)
4. ORSTOM (Institut Français de Recherche Scientifique pour le Développement en Coopération) (France), using parasite material from the Central African Republic
5. Tsetse Control Department (Uganda)
6. University of Yaounde (Cameroon)

The role cytotoxic T cells play in protecting livestock against *Theileria parva* (Ph.D.Thesis)

Cattle that survive infection with *Theileria parva*, a protozoan parasite that causes East Coast fever, are thereafter immune to homologous challenge for long periods. It is known that immune animals possess cytotoxic T lymphocytes (CTLs), white blood cells that specifically recognize and destroy parasitized cells. However, direct evidence that CTLs are involved in protection has not been reported. To address this question, a limiting dilution micro-assay was developed for determining the frequency of *T. parva*-specific CTLs in cattle before and after exposure to the parasite. The assay was then used to clarify the role these cells play in recovery and protection from East Coast fever.

In one series of experiments, five immune cattle were challenged with *T. parva* (Muguga). Using lymphatic cannulation techniques, it was possible to collect the fluid draining from the infected lymph node and so determine the kinetics of the CTL response generated by this challenge. CTLs were collected at the peak of the response and transferred to a naive, lethally infected twin of the donor. The results demonstrated that these cells are indeed capable of clearing the parasite from an animal.

In a separate experiment, 23 cattle were immunized with either the Muguga stock of the parasite or a cloned population of the immunologically distinct Marikebuni stock, and the specificities of their CTL responses were determined. The susceptibility of these animals to challenge with the reciprocal stock was then evaluated to determine if the specificity of the response can be correlated with cross-protection. The study revealed that CTL specificity was reflected in cross-protection.

The results of these experiments provide further evidence that parasite-specific CTLs play a major role in protective immunity against *T. parva*.

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