

**The Importance of Macrophages, T-  
Lymphocytes and Passive Transfer of  
Antibody in the Protection of Mice  
against *Shigella* *Dysenteriae* Type 1.**

Koleosho, Tinuola

M.Sc. Microbiology

Department of Microbiology

Obafemi Awolowo University, Ile Ife, Nigeria

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## **Abstract:**

The contribution of T-lymphocytes, macrophages and antibodies to protection against Shigella dysenteriae type 1 during the course of infection in mice was analysed following intraperitoneal injection of the organism into mice.

Approximately  $1.55 \times 10^5$  cells of Shigella dysenteriae was injected into each mouse. At intervals, the liver and spleen were dissected out to obtain fresh isolates of the organism from these organs. Ten minutes after the inoculation,  $\sim 1.59 \times 10^4$  and  $4.79 \times 10^3$  Shigella cells were recovered from the liver and spleen respectively. The number of trapped bacteria decreased from 10 million to reach minimal levels by 6 hours and then increased to reach maximum levels by 24 hours; gradual elimination occurred after 3 days.

Carrageenan (a toxic macrophage blocker) was injected into another set of mice 24 hours prior to infection with Shigella. Carrageenan treatment significantly ( $p < 0.05$ ) enhanced the bacterial growth in the liver and spleen. This observation suggests that carrageenan sensitive macrophages are very important in the protection against Shigellosis.

The role of antibody was investigated in a serum transfer experiment, AntiShigellae antibody that was raised in Rabbit was used to passively immunize another set of mice 24 hours prior to the challenge with Shigellae. It was observed that although antibody was produced (titer 1:320), it had no protective role on passive transfer.

The contribution of T-cells to protection was examined in another set of mice by immunosuppressing T-cells with antithymocytic serum (ATS) 24 hours prior to challenge with Shigellae. The ATS was raised in Rabbit injected with thymocytes pooled from another set of mice. There was a significant ( $p < 0.05$ ) increase in bacterial count in ATS treated mice, showing that T-cells also play a significant role in protection against Shigella. It seems that the protection of mice against Shigella dysenteriae depends on the synergistic action of macrophages and T-lymphocytes.

**Keywords:** Antibodies/ T-lymphocytes/ macrophages / mice/ organisms/ intraperitoneal injections/ inoculation/ shigella dysenteriae/ bacterial growth

**Supervisor:** O.O. Shonukan.

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