

Mutual Interaction of TH1 and TH2 Functions with Male Sex Hormone in the Protection to *Plasmodium chabaudi chabaudi*

Zhi-Hui ZHANG, Susumu SAITO and Fujiro SENDO

Department of Immunology & Parasitology, School of Medicine, Yamagata University, Yamagata, Japan

In order to systematically clarify the mechanisms of protection against *Plasmodium chabaudi chabaudi* (*P. chabaudi*) infection in mice, in the present study, we utilized both IFN- γ receptor deficient (IFN- γ R^{-/-}) and IL-4 deficient mice (IL-4^{-/-}) and compared mortality and parasitemia of these two gene knockout strains of mice with each other and with those of their wild type counterparts (IFN- γ R^{+/+} and IL-4^{+/+}).

When we used male mice, both IFN- γ and IL-4 were suggested to be involved in protection against lethal infection of malaria as already suggested by many previous works. On the other hand, when we used female mice, we did not get such a conclusion, suggesting that protection mechanisms are more complex than was ever proposed.

On the other hand, regulation mechanisms of parasitemia may not depend on sex difference, since no definite difference in parasitemia was observed between male and female mice in any strains of mice used. Enhanced parasitemia was observed only when we used IFN- γ R^{-/-} but not IL-4^{-/-} in comparison with their counterparts, IFN- γ R^{+/+} and IL-4^{+/+}, respectively, suggesting that IFN- γ is a responsible factor for inhibition of parasitemia.

Furthermore, our present results firstly suggest the possible counteraction by immune system to endocrine functions in protection against *P. chabaudi* infection, suggesting a circuit regulation paradigm between immune and endocrine system under a situation of our experiments. We discuss the mechanisms of these phenomena.