

POSTPRANDIAL LYMPHATIC FLUX AND MALARIA

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Summary :

24 hours after an intra-peritoneal inoculation of frozen blood infected with *Plasmodium yoelii nigeriensis*, the malarial infection is non detectable in most starved mice while it is patent in mice fed 2 hours before the inoculation. It is assumed that the post feeding lymphatic flow brings to the blood the latent merozoites.

KEY WORDS : murine. *Plasmodium*. latent merozoites. lymphatics.

Résumé : FLUX LYMPHATIQUE POSTPRANDIAL ET PALUDISME

Après inoculation intra-péritonéale de sang congelé, infecté par *Plasmodium yoelii nigeriensis*, l'infection palustre est faible chez les Souris maintenues à jeun, et forte chez les Souris alimentées. Le flux lymphatique postprandial amènerait dans le sang les mérozoïtes latents.

MOTS CLÉS : *Plasmodium* de muridés. mérozoïtes latents. lymphatiques.

INTRODUCTION

Many investigations demonstrating the existence of latent merozoites in the rodent malaras were published recently and summarized by Landau & Chabaud (1994). Latent merozoites are merozoites which do not penetrate into red blood cells (RBCs) immediately after the rupture of schizonts and are supposed to find their way into the lymphatic system, where they have no contact with the RBCs. This hypothesis has been confirmed by the direct demonstration of malaria parasites inside the lymphatic vessels (Landau *et al.*, 1995).

Some confirmation of these results has been obtained by studying a very simple physiological phenomenon. It is possible to induce a powerful lymphatic flow in infected animals by a sudden meal and study its effect on the course of infection. Comparison was made between the infections in unfed mice and in mice fed just prior to the infection.

MATERIAL AND METHODS

Food was withdrawn from batches of mice which, in our laboratory conditions, eat mainly during the night-time at day (D) 0, 16:00 hours (h). The next day at

D1, 10:00 h, food *ad libitum* was given to some mice and not to the control mice. Two hours later at D1 12:00 h all mice were inoculated intraperitoneally with 0.5 ml of a stock of frozen-thawed blood infected with *Plasmodium yoelii nigeriensis*. The following day (D2, 12:00 h) blood smears of all mice were performed. Those mice with a parasitaemia of at least one parasite per 1.000 RBCs were considered as "positive".

RESULTS

First experiment:

- Fed mice: 4 positive, 1 negative
- Starved mice: 1 positive, 4 negatives

Second experiment:

- Fed mice: 5 positive, 0 negative
- Starved mice: 0 positive, 6 negative

Third experiment:

- Fed mice: 5 positive, 0 negative
- Starved mice: 0 positive, 3 negative

DISCUSSION

Montalvo-Alvarez *et al.*, 1988 showed that after freezing and thawing of blood infected with *P. v. petteri* without reestablishing the osmotic pressure, the only or almost only surviving stage was the free merozoite. Following indirect arguments, we postulated that it is true for *P. y. nigeriensis*.

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It is also common knowledge that a meal causes a strong lymphatic flow.

We consider the results reported here as additional evidence of the importance of the circulation of merozoites of *Plasmodium* in the lymphatics. We assume that when inoculated intraperitoneally many merozoites are rapidly taken by the lymphatic system and poured with more or less speed into the blood stream.

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