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MURINE LEPROSY INFECTIONS IN MOUSE MESENTERIES

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This is a report on the infectious processes of murine leprosy in mouse mesenteries.

MATERIALS AND METHODS

Female DD mice 4 weeks after birth were injected with 10^6 Hawaiian strain murine leprosy bacilli intraperitoneally. One mouse was sacrificed each week. Stretched specimens of mesentery and stamp specimens of heart, lymph nodes, lung and liver were made. The method of making the mesentery specimen was as follows. The peritoneal cavity of the sacrificed mouse was opened, the large and small intestines were resected at the duodenum, rectum and portal region, and the intestines were taken out, and cut off in appropriate sizes. The blocks of intestine were stretched on the slide glasses. The specimens were dried about 30 minutes in an incubator and the intestines were cut off from the mesentery by a razor, and dried one hour more.

The specimens were fixed with 10% buffered Formalin and stained by the Ziehl-Neelsen method. The murine leprosy bacilli suspensions were cultured on heart infusion agar, 1% Ogawa's medium and Sabouraud's medium. As controls, specimens from mice injected with heat-killed murine leprosy bacilli and fron noninfected mice were made according to the same methods.

RESULTS

Fig. 1 shows the mesenteries 4 weeks, 5 months and 7 months after infection with living murine leprosy bacilli, and 6 months after infection with heat-killed bacilli. In the 5 month specimen, many small murine lepromas were seen as small blue spots (Fig. 1). They could be seen with the naked eye. As the infections progressed, the mesentery shrank, because the surrounding areas turned into murine lepromas.

Fig. 2 shows the noninfected mesentery magnified 32 and 800 times. Although it is thought that the mesentery consists of 2 layers of membranes, in this specimen it showed up as a monolayer cell membrane.

Fig. 3 shows the mesentery 5 weeks after infection with living bacilli magnified 32 and 800 times. Cell aggregations were seen in various places on the mesentery (Fig. 3A). These aggregated cells were macrophages and lymphocytic cells. Phagocytosis of the murine leprosy bacilli was seen (Fig. 3B).

Figs. 11, 5, 6 and 7 show the multiplication processes of the murine leprosy bacilli. I found that the bacilli seemed to elongate to about double or triple their sizes, before they divided and lay parallel to each other. This process was repeated until the bacilli became bundle-like forms in the cytoplasm of the host cells. This is the so-called "slipping form."

Fig. 8. Three months after infection murine globi were formed.

Fig. 4 shows the mesentery 5 months after infection with living bacilli magnified 32 and 800 times. There were many centers of infection on the mesentery and these turned out to be small murine lepromas. The infections spread to the surrounding areas. The macrophages were infected by murine leprosy bacilli in the early stages and infections of the parenchymal cells followed finally.

Fig. 9. The bacilli were circulating in the blood one month after infection. This is a stamp specimen of the heart 5 months after infection with living bacilli. Many murine lepra cells were seen.

Fig. 10. The bacilli were seen in the axillary and inguinal lymph nodes taken 2 months after infection. This is a stamp specimen of the lymph nodes 7 months after infection. The lymph nodes increased in size and became murine lepromas. Of course, in the mesenteries from noninfected mice, murine lepromas were never seen (Fig. 1).

FIG. 1. Specimens of mouse mesenteries. from left, the mesentery 4 weeks, 5 months, and 7 months after infection with living murine leprosy bacilli, and 6 months after infection with heat-killed bacilli.

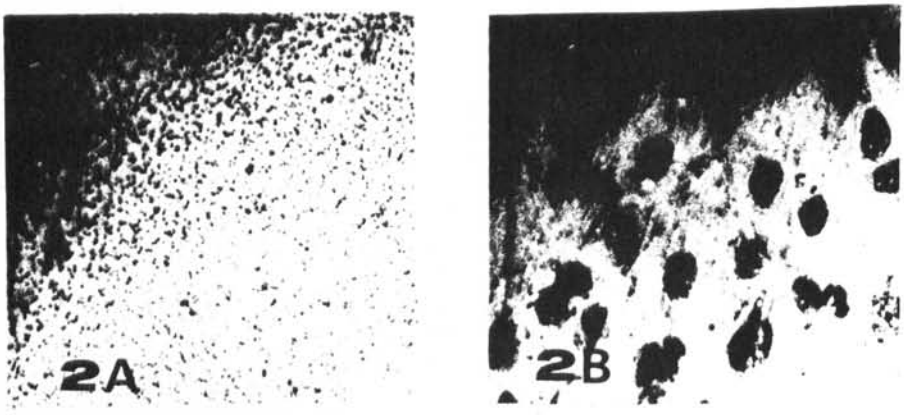


FIG. 2. Mesentery from a noninfected mouse.
(2A, X32) (2B, X800)

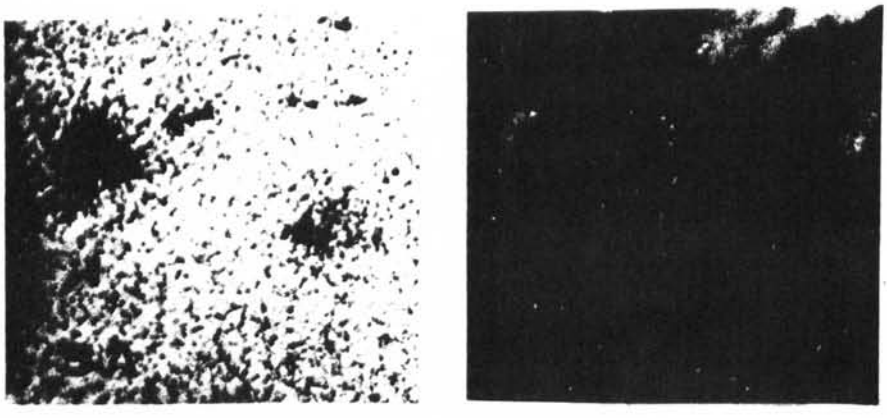


FIG. 3. Mesentery 5 weeks after infection.
(3A, X32) (3B, X800)

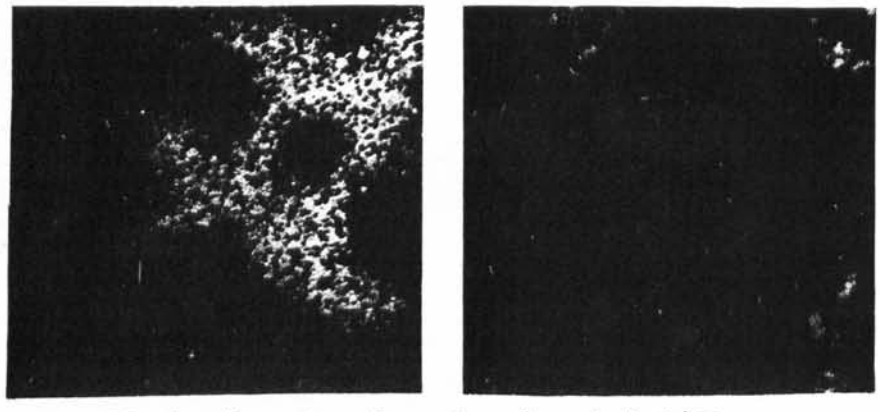
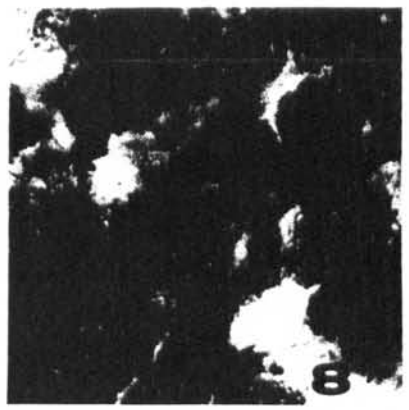


FIG. 4. Mesentery 5 months after infection.
(4A, X32) (4B, X800)



FIGS. 5, 6, 7, 8. Multiplicational processes of murine leprosy bacilli. X800.

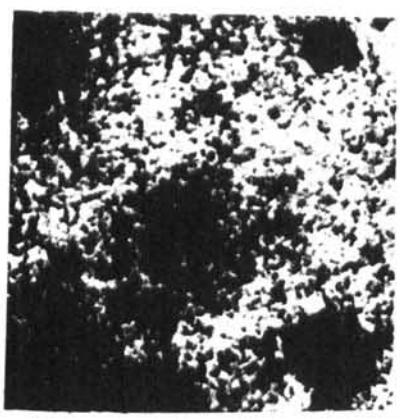


FIG. 9. The stamp specimen of mouse heart 5 months after infection. X800. FIG. 10. The stamp specimen of mouse lymph nodes 7 months after infection. X800.

FIG. 11. The scheme of the multiplication of murine leprosy bacilli.