

Differences in *M. leprae*-Induced Nerve Damage in Swiss White and C57BL/6 Mice

TO THE EDITOR:

Based on our earlier observations that Schwann cells⁽²⁾ and macrophages^(1,4) of Swiss white and C57BL/6 mice respond differently to *Mycobacterium leprae* infection, the present study was undertaken to determine if this difference was reflected in the pattern of nerve damage induced by *M. leprae* in these two strains.

The mice were inoculated with 10^4 *M. leprae* in each hind foot pad. At regular time intervals, the mice were anesthetized with pentobarbitone and the sciatic nerve biopsies were obtained. The biopsies were fixed in 2.5% glutaraldehyde, post-fixed in osmium tetroxide, and embedded in araldite. Semithin sections 1- μ m thick stained with toluidine blue were used for light microscopy, and subsequent ultrathin sections stained with uranyl acetate and lead citrate were observed under the electron microscope. After the nerve biopsies were collected the mice were killed and the foot pad harvests done according to the method of Rees⁽⁵⁾.

M. leprae growth in the mouse foot pad was comparable in the two strains up to the 20th post-inoculation month.

The pathology observed in the sciatic nerves of *M. leprae*-inoculated Swiss white mice was similar to the early changes seen in leprosy patients^(6,7): at 6–8 months post-inoculation there was an involvement of

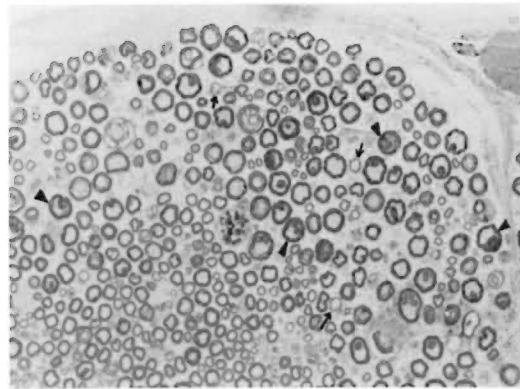


FIG. 1. Part of the sciatic nerve from a Swiss white mouse inoculated in the foot pad with *M. leprae* 20 months prior to biopsy. Increased interfiber space seen, suggestive of loss of myelinated fibers. Also present are small thinly myelinated fibers (arrows) and several large myelinated fibers with highly irregular myelin (arrow heads), indicating remyelination and atrophic changes respectively (araldite-embedded tissue, 1- μ m thick section stained with toluidine blue $\times 200$).

predominantly unmyelinated fibers which progressed to extensive demyelination by the 20th post-inoculation month (Fig. 1). In the C57BL/6 strain, however, while the unmyelinated fiber involvement at 8th month post-inoculation was comparable to the Swiss white mice, it did not progress further to demyelination even though the acid-fast bacilli count at the 20th month was similar in both strains (Fig. 2).

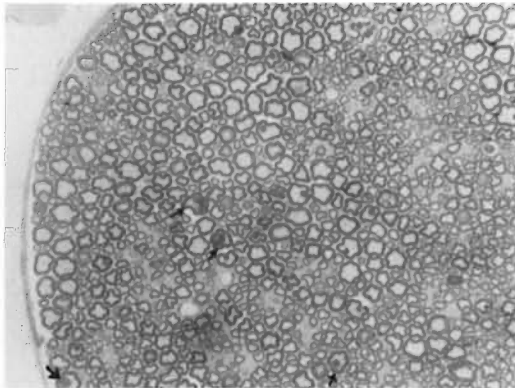


FIG. 2. Part of the sciatic nerve from a C57B/6 mouse inoculated in the foot pad with *M. leprae* 20 months prior to biopsy. Note that no significant fiber loss or regenerating units are seen in this nerve. However, there are a few large myelinated fibers with irregular myelin (arrows) suggestive of atrophy (araldite-embedded tissue, 1- μ m thick section stained with toluidine blue $\times 200$).

These differences in nerve damage patterns in the two strains may be due to the differential Schwann cell functions of providing immunological sensitization⁽³⁾ and the differential expression of NGF receptor and cell-adhesion molecules (unpublished observations).

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