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XII INTERNATIONAL LEPROSY CONGRESS REPORTS OF THE WORKSHOP COMMITTEES

COMMITTEE 1: WORKSHOP ON EXPERIMENTAL LEPROSY

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The workshop reviewed advances in the last five years in four major animal models of experimental leprosy: a) immunologically intact mice, b) armadillos, c) athymic, nude mice and rats, and d) primates.

Immunologically intact mice continue to be the experimental leprosy model of choice for determining drug sensitivity of clinical isolates of *Mycobacterium leprae,* for routine determination of viability of *M. leprae,* for determining the bacteriostatic or bactericidal action of antileprosy drugs and other uses. A newer model was presented consisting of an immune tolerant animal following the intravenous injection of 10^7 *M. leprae* in naïve mice. In mice rendered tolerant by intravenous injection of *M. leprae,* intradermal challenge does not result in delayed-type hypersensitivity (DTH). Various potential antileprosy vaccines have been used as a means of overcoming this tolerance. With the possible exception of BCG, none have been successful.

Armadillos continue to be utilized primarily for the production of *M. leprae.* Armadillos from the U.S. consistently are capable of yielding large numbers of *M. leprae* (more than 10^9 bacilli per gram of tissues from the liver, the spleen and the lymph nodes) within approximately two years of inoculation with viable bacilli. Wild-caught U.S. armadillos sometimes have a variety of other infections including: a) natural infection with *M. leprae,* b) *Sporotrichium shenkii* (up to 63%), c) coryneform organisms, d) cultivable mycobacteria, e) *Trypanosoma cruzii,* f) *Salmonella typhimurium,* coccidioidosis, etc. Natural infection with *M. leprae* seems to be found in Texas and Louisiana, but not in Florida, in the U.S. Successful breeding of nine-banded armadillos (*Dasypus novemcinctus*) in captivity has occurred in Brazil. Experimental transmission has also been successful with *Dasypus hybridus* in Argentina. This species is of considerable interest since it breeds easily in captivity.

A number of laboratories around the world are now working with nude mice as a model for lepromatous leprosy. Yields of bacilli as high as 10^{11} per mouse have been reported 18 months after inoculation with high doses of *M. leprae.* In Nepal, excellent survival of nude mice has been reported in a clean room without special isolators. *M. leprae*-infected nude mice are being used as models for chemotherapeutic and immunologic studies. Other work has utilized neonatally thymectomized Lewis rats and congenitally athymic rats.

Renewed efforts to utilize primates as models of leprosy have been successful. Naturally occurring leprosy has been reported in a sooty mangabey monkey. The animal, captured in West Africa and subsequently suspected of having leprosy, was further investigated and the diagnosis confirmed. Histologically the lesions were of the subpolar lepromatous type of leprosy. The acid-fast bacilli (AFB) found in large numbers were indistinguishable from *M. leprae* by the available parameters of identification. The organisms from this monkey were passaged to two mangabey monkeys, two rhesus monkeys, three African green monkeys, and three squirrel monkeys. Inocula-

tion was by intravenous as well as intracutaneous routes except in one rhesus monkey which received only intracutaneous inoculation. The dose inoculated was on the order of 10^9. The mangabey, the rhesus, and the African green monkeys developed leprosy within two years. The rhesus monkey inoculated intracutaneously and the squirrel monkeys did not develop the disease. Human (armadillo-adapted) *M. leprae* were inoculated to mangabey, rhesus, and African green monkeys. The mangabey monkey showed evidence of dissemination of disease within ten months. No manifestations of the disease were evident in the rhesus or the African green monkeys at 28 months.