

COMPARISON OF SUSCEPTIBLE AND RESISTANT RATS
FOR MEASURING THE INFECTIONOUSNESS OF
M. LEPRAE MURIUM AFTER *IN VITRO*
EXPERIMENTATION

JOHN H. HANKS
AND TOBEY BACKERMAN

*Leonard Wood Memorial, Department of Bacteriology and Immunology
Harvard Medical School, Boston, Massachusetts*

In an earlier communication (3) evidence was presented that subcutaneous inoculation of moderately resistant rats permits sharp distinctions between murine leprosy bacilli possessing different degrees of infectiousness. It was thought that such animals should be of greatest usefulness in making comparisons between highly infectious suspensions of bacilli, and that more susceptible rats should provide adequate distinctions between less infectious suspensions.

Recent studies with refrigerated bacilli provided occasion to obtain data on this question. Comparisons were made between members of the moderately resistant, inbred family of Wistar rats previously described (1, 2), and groups of more susceptible "Wiersing" rats.¹ Six sites were inoculated in each rat, in the rotating pattern, and nine rats were used per group (3).

Rat leproma suspensions were refrigerated for three months in glycerol 40 per cent (Nos. 1 and 2), sucrose 31 per cent (Nos. 3 and 4), and albumin 15 per cent (Nos. 5 and 6). Two lots in each of these media were set up at different hydrogen ion concentrations, one at pH 6.5 (odd numbers) and pH 7.5 (even numbers).

The results given in Table 1 show the time required for development of palpable lesions, the proportion of lesions positive at autopsy, and their average weights. It should be noted that in two instances where lesions were not palpable, some very small ones were recovered at autopsy. The results in the two groups of rats agree in identifying suspensions No. 6 as the most infectious, No. 5 as the second choice, and No. 1 and 3 as noninfectious during the periods of observation. Suspensions No. 2 and 4 were regarded as possessing com-

¹ Purchased from William Wiersing, 84 Cortland Street, Belleville, N. J.

TABLE 1.—Comparison of lesion development in Wistar and Wiersing rats inoculated with refrigerated murine leprosy bacilli, after 3 to 8 months.

Rats	Site No./ ^a	Per cent of lesions palpable/ ^b (months)					Lesions positive at autopsy	Final average weight of lesions
		3	4	5	6	8		
Wistar	1	....	....	....	....	....	(8 mos.) 0/7	....
	2	....	....	0 (1)	0 (1)	0 (1)	4/7	0.02
	3	....	....	....	....	....	0/7	....
	4	....	....	....	0 (1)	0 (1)	3/7	0.06
	5	....	13 (1)	25	38 (2)	43 (3)	7/7	0.30
	6	....	25 (2)	50 (1)	63 (1)	86 (1)	7/7	0.89
Number of rats surviving		9	8	8	8	7		
Wiersing	1	....	....	....	....	....	(6 mos.) 0/9	....
	2	....	....	....	....	....	9/9	0.38
	4	....	....	....	....	....	7/9	0.13
	5	....	44	56	89	....	9/9	1.81
	6	22	100	100	100	....	9/9	4.59
Number of rats surviving		9	9	9	9	....	

^a The numbers in this column refer to the suspension numbers as given in the text.

^b The open figures are the percentages of positive lesions in the 9 rats of each group. The figures in parentheses refer to the numbers of additional questionable lesions.

parable infectiousness, since the higher average for No. 4 in Wistar rats and No. 2 in Wiersing rats was due to a single heavy lesion in one animal of each group.

The comparative usefulness of the two types of rats may be judged by the time required to obtain sufficient information to permit further experimentation. The most favorable refrigeration solution was indicated in 100 per cent of Wiersing rats after four months, while the corresponding sites were palpable in only six of seven Wistar rats after seven months. After five months the second choice was evident in five of nine Wiersing rats and in only two of eight Wistar rats. Although the Wiersing rats were autopsied two months earlier than the Wistar rats, the average weight of all positive lesions in them was five times greater than in the Wistar animals.

The latency which may occur in the more resistant rats

has been described (2). During the present comparisons, the greater incidence of questionably palpable sites in Wistar rats was not confined to individual animals or test inoculums. A site recorded as questionably positive at one reading might be regarded as negative on the next occasion. Intermittent activation of tissue response possibly plays a role in preventing rapid development of lepromas in these animals.

CONCLUSIONS

The data presented suggest that the more susceptible rats may serve for all purposes where information is desired on suspensions of declining infectiousness. As has been emphasized previously, the more resistant rats may be required for sharp distinctions between highly infectious suspensions of bacilli.

RESÚMEN

Los autores compararon la susceptibilidad de dos cepas de ratas blancas (Wistar y Wiersing) a infección con suspensiones de *M. leprae murium* obtenidos de lesiones lepromatosas murinas. Por medio de variaciones en el inóculo los autores demostraron que la rata del tipo Wiersing es más susceptible y puede usarse cuando se desea información relacionada a bacilos de poca infectividad. Las ratas del tipo Wistar son más resistentes y deben usarse para diferenciar claramente material de gran virulencia.

REFERENCES

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