Technical Papers

Lack of Bactericidal Effect of Mouse Serum on a Number of Common Microorganisms*

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Study of the bactericidal effect of the blood serum of the adult white mouse (albino *Mus musculus*) was undertaken as part of an investigation of the relative role of antibiotics and of nonspecific defense mechanisms in resistance to experimental infection. Various substances and procedures (such as x-irradiation and adrenalectomy) were to be tested for their effect on the bacterial power of mouse serum acting against suitably susceptible bacteria. The method was standardized using rabbit serum because of the relative difficulty of obtaining mouse serum.

In the method used, 0.25 ml of a saline dilution of an 18-hr nutrient broth hour culture of *Bacillus subtilis* (ATCC PCI 220) was added to a tube containing 2.0 ml of a saline dilution of fresh rabbit serum. The mixture was incubated at 37°C. The effects of varying the size of the inoculum, the dilution of serum, and the time of incubation were studied. It was found that when the inoculum was about 2000 organisms (as determined by plate count), rabbit serum diluted 1:10 would render nonviable about 99 percent of the bacteria in 2 hr.

Since this method showed rapid killing of *B. subtilis* by rabbit serum, this organism and also a strain of *Escherichia coli* were tested using mouse serum which was obtained from the pooled blood of eight mice. No evidence of bactericidal action of the fresh mouse serum during 1- or 2-hr incubation was noted with either organism with a 1:3 and 1:10 dilution of serum and inocula of 2000 and 10,000 organisms. A number of other organisms were tested on three different days against fresh pooled mouse serum (four to eight mice) diluted 1:3, inocula of the order of 10,000 bacteria and an incubation time of 2 hr.

The organisms used in these experiments, with the exception of *B. subtilis*, were obtained from the stock culture collection of the Department of Bacteriology, University of Utah. The test organisms were *B. subtilis, E. coli, Pseudomonas aeruginosa, Ps. fluorescens, Proteus vulgaris, Aerobacter aerogenes, Alkaligenes fecalis, Vibrio comma,* and *Salmonella ballerup.*

With none of the aforementioned organisms was there evidence of killing by mouse serum under the experimental conditions described. Indeed, the bacteria were not even inhibited, since in every instance the final bacterial concentration exceeded the initial concentration. Sterility controls showed the serum itself to be free of bacteria in every case.

In addition to the experiments cited, 13 additional experiments have been carried out with serum pools from three or four mice (five experiments with albino *Mus musculus,* six with CBA strain mice, and two with wild *Mus musculus* captured at the Salt Lake City Zoo). The test organism in these later experiments was *B. subtilis.*

The mouse has received very little attention with respect to this type of study. Zinsser, Enders, and Fothergill (*1*) have reviewed numerous studies on the bactericidal action of serum from a variety of common laboratory and domestic animals with the exception of the mouse. Since the organisms employed in the present experiments were species ordinarily susceptible to the bactericidal action of serum from other animals (*2*), the results suggest that mice occupy a unique position among mammals in having serum devoid of bactericidal power against these organisms.

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Plant Tissue Cultures Produced from Single Isolated Cells*

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The value of plant materials for fundamental studies of growth was increased by the successful cultivation of plant tissues *in vitro* (*1–4*). Although this development was an important advance, the desirability of producing such cultures from single isolated cells has long been recognized (*5*). Plant tissue cultures display a degree of physiological and morphological variability that may be troublesome in analytical investigations. Although the tissue of a culture is derived from one plant, the potentialities of the cells may differ. This seems especially true of cultures derived from pathological growths, such as crown

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