

4023

Antigenic Relationships of Certain Strains of *Staphylococcus Aureus* as Shown by Agglutinin Absorption.

J. G. HOPKINS AND N. BARRIE.

From the Departments of Dermatology and of Bacteriology, College of Physicians and Surgeons, Columbia University.

Hemolytic strains of staphylococcus producing a varying amount of yellow pigment are found in pyogenic processes, in septicemias, and also in non-suppurative types of dermatitis and on apparently normal skin. The majority of strains from these varied sources cross-agglutinate in monovalent serums. In an attempt to differentiate them by the method of agglutinin absorption an interesting relationship has been brought out which is in accord with the hypothesis of a multiple antigenic composition for such organisms.

Agglutinating sera were made in rabbits and reciprocal agglutinating absorptions carried out. To obtain constant results it was found necessary to use fresh suspensions of standard strength and even so, specific reactions seemed obtainable only in narrow quantitative limits. If too heavy suspensions were used absorption was obtained which was apparently non-specific. This was due probably to adsorption of the anti-bodies by the bacteria, similar to that which can be accomplished by thick finely divided insoluble suspension of many substances. Tentative grouping could be obtained by testing the varied serums in an optimum dilution, but for clear cut results the following technique was found most satisfactory: A series of dilutions of the serum from 1-10 to 1-12,800 was prepared and each dilution absorbed with a standard dose of fresh cocci. After absorption and centrifugation the supernatant fluid was divided into 2 parts and tested for agglutination; one part against the strain used for absorption and the other against the strain used for production of the serum. With completely analogous strains complete absorption appeared at the same dilution, that is, if all the anti-bodies for the absorbing strain were removed those for the immunizing strain were also removed. Such a reaction, however, was not always reciprocal and a given strain often absorbed all the agglutinin from the serum from another strain when a suspension from this second strain would not remove all the agglutinin from a serum prepared against the first. In reciprocal tests with three strains A, B and C, it was found that:

A absorbed all the agglutinins from serums prepared against A and B.

C absorbed all the agglutinins from serums prepared against B and C.

B failed to absorb all the agglutinins from either A or C.

This could be explained on the hypothesis that strain A contained agglutinogenic substances A and B; that strain C contained agglutinogenic substances B and C; but that strain B contained only agglutinogenic substance B. It is realized that such a statement is probably a crudely symbolic method of indicating the difference in physico-chemical composition of these different races.

Many other strains have been encountered which on simple absorption tests seem to fall into each of these 3 groups. Agglutinating sera had been prepared against 1 or 2 representatives of each group and on reciprocal absorption tests the strains appeared completely homologous with those on which tests are here recorded. These strains therefore probably represent groups and not individual variants. So far, no members of groups B or C have been found in frankly pyogenic processes, but the number tested is insufficient to make this finding more than suggestive. Similar relationships have been found by Krumwiede and others in the Gram-negative bacilli but these findings are here reported because they present an unusually clear-cut instance of such reciprocal agglutinating relationships.

4024

Immunologic Reactions with Tobacco Mosaic Virus.

HELEN A. PURDY. (Introduced by F. P. Gay.)

From the Department of Bacteriology, College of Physicians and Surgeons, Columbia University, and the Boyce-Thompson Institute for Plant Research, Inc., Yonkers, N. Y.

A study of the immunologic reactions with a tobacco mosaic virus to an antiserum from rabbits has been undertaken with the hope of throwing more light upon the nature of the virus.

Antisera were produced separately by intravenous injections of rabbits with sap extracted from healthy Turkish tobacco plants, and sap from plants affected with tobacco mosaic virus. In several series of alexin-fixation experiments, each antiserum was titrated with its homologous and heterologous antigen. The higher titer for a given antiserum was obtained with the homologous antigen. These results are in agreement with Dvorak,¹ who compared the precipitin reac-