TAXONOMIC IMPORTANCE OF
STAPHYLOCOCCAL ANTIGENS

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SUMMARY. There is little, if any antigenic relationship between micrococci and staphylococci. Staphylococcus aureus and S. epidermidis have some common antigens. Three identifiable antigens are considered to be species-specific for S. aureus, which also has many type-specific antigens.

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The picture of the antigenic structure of Staphylococcus aureus now starts to take shape. We know less of the antigens of S. epidermidis and nothing of the antigens of micrococci. The taxonomic side has hardly been considered and it may therefore be of interest to see what possibilities exist. As there is still considerable doubt as to the classification of staphylococci and micrococci, it would be of value if antigenic analysis could add to the information obtained from morphologic and physiologic methods. In my experience the antigens of staphylococci are rather stable.

First, we want to know whether antigenic analysis confirms the classification of staphylococci and micrococci into two genera. The antigenic basis for a subdivision of each genus should then be considered.

Personal preliminary work on 20 type strains of micrococci indicates that there is little, if any antigenic relationship between micrococci and staphylococci. As two strains of M. conglomeratus and two strains of M. varians gave a polysaccharide A line on agar gel precipitation, these strains may belong to the genus Staphylococcus. Serologic methods may be helpful in controlling the ability of morphologic and physiologic methods, e.g. anaerobic glucose fermentation to distinguish staphylococci and micrococci.

Both slide agglutination and agar gel precipitation have demonstrated antigens common to Staphylococcus aureus

and S. epidermidis. One common major precipitinogen is being studied in our laboratory. We do not know if micrococci also have common antigens.

Three antigens are considered to be species specific to S. aureus. One is protein A, which has been purified and shown to contain 15% nitrogen and ten amino acids. The other two antigens are polysaccharide A and polysaccharide 263 which are identical to wall ribitol teichoic acid. The antigenic specificity is due to N-acetylglucosamine, the only difference between the two antigens being that in polysaccharide A the sugar is in the β position while in polysaccharide 263 it is in the α position. Each of these three antigens produces a specific precipitation line on agar gel diffusion.

So far, serologic investigations indicate that S. epidermidis should be divided into subgroups. The wall teichoic acid is of the glycerol type and different sugars have been demonstrated. In S. epidermidis also the sugar seems to determine the serologic specificity. One subgroup appears to have the S. aureus antigen, polysaccharide A, in addition to the specific antigen.

S. aureus has a number of type-specific antigens which can be demonstrated on slide agglutination in specific factor sera. At present 30 agglutinogens are known. The majority of the strains have more than one type-specific antigen. Strains are therefore characterized according to their antigenic patterns.

In conclusion I will emphasize the desirability of taking antigenic structure into consideration when working on the taxonomy of staphylococci and micrococci.

REFERENCES

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