THE SECRETOR CHARACTER *

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The secretor character is a genetically determined trait which is closely related to the ABO blood group system. In the late 'twenties, the observation was made that A and B antigens were detectable in the saliva of some, but not all, people of blood groups A and B. This variation seemed to be an inherited normal character. The genetic basis was thought to be two allelic genes found at the secretor locus. The original symbols of the genes, S and s, were later changed to Se and se, respectively, to avoid confusion with the MNSs blood group system. Three genotypes were possible : SeSe, Sese and sese. The Se gene is dominant which implies that there are two phenotypes : secretor, based on the presence of the dominant gene in the heterozygous or the homozygous condition, and non-secretor, based on the presence of the recessive gene se in the homozygous condition.

The chromosome carrying the secretor locus is not — as far as we know — the ABO chromosome, nor is the secretor locus closely linked to the ABO locus. We do know, however, that the secretor locus is in the neighborhood of the Lutheran blood group locus, separated from it by a distance of about 15 centimorgans. It is highly improbable that any of the other blood group loci are on this chromosome.

The phenotypic expressions of the two genes lie in the presence or absence of water-soluable ABH substances in the saliva, other body fluids and cells (except the red cells). All people, irrespective of whether they are secretors or non-secretors, have some A, B, or H antigens in their tissues (except for brain tissue), but in alcohol-soluble form. These antigens are not influenced by the genes at the Sese locus.

The nature of the antigen found in the serum and secretions of a secretor is determined by the genes at the ABO locus. Furthermore, it looks as if the presence of at least one dominant gene at the hypothetical Hh (or Xx) locus is needed to make the antigens

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detectable in the secretions. This dominant gene determines, among other things, the conversion of the red cell antigen precursors into H substance. It seems that only the H substance itself, not the precursor, can be molded into detectable antigens in the secretions. These facts indicate a close relationship with the ABO system.

It seems clear that red cell group O individuals definitely secrete more H substance (and seemingly nothing else) than red cell group A or B individuals.

Technically speaking, the secretor character is more difficult to investigate than most of the blood groups. It is not a question of agglutination only, but of inhibition before agglutination. The sample of saliva to be tested is brought into contact with an antibody of known and defined strength. Next, the antigen content of the saliva is determined. If an antigen is present in the saliva, the antibody will be removed or its titer reduced. Thus, if the titer decreases significantly, the saliva sample is from a secretor. For a long time, it was difficult to find antibodies to be used in studies of saliva from red cell group 0 individuals. However, the introduction of saline extracts of the seeds of *ulex europaeicus*, which provides a powerful anti-H substance, has changed the picture. Saliva of individuals of red cell group A or B can be tested in solutions containing ordinary anti-A or anti-B.

The proportion of non-secretors, at least in European countries, is generally about 20 to 25 per cent. The number of saliva studies carried out on populations of the word is still fairly low.

Much work remains to be done in the study of this character. For instance, it appears that the amount of the substance secreted is an inherited characteristic, but the mode of inheritance is not simple, i.e., not due to a series of alleles at the secretor locus. In persons of red cell group A, the ratio A/H seems, furthermore, to vary among individuals, and this ratio seems also to be genetically determined.

Lewis substances are also found in the saliva of persons with the relevant genotype, but no trace of antigens belonging to other blood group systems have been observed.

The use of the term «secretor» without qualification is limited to denote persons presenting A, B and/or H substances in their saliva.