The Production in Chickens of Precipitating Antibody
to Lea Substance and its Application to the Study of the
Secretion of Lea Substance

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Abstract

Blood group substances possessing only Lea activity were isolated from the pseudomucinous ovarian cyst fluid of a woman who is a group A nonsecretor and from the saliva of a group B nonsecretor. On injection into chickens, antisera were produced capable of precipitating with Lea-active substances, whether derived from cyst fluid or saliva. These antisera were used to test for the secretion of Lea substance in materials isolated from cyst fluids and saliva specimens of secretors and nonsecretors.

Agglutination by Rheumatoid Sera of Red Cells Coated
with Non-Agglutinating Anti-D Antibody

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There is a factor in the sera of patients with rheumatoid arthritis which will bring about agglutination of D-positive cells coated with certain incomplete anti-D sera. In this reaction the rheumatoid serum superficially behaves like a Coombs (antiglobulin) serum, developing agglutination where there was previously none. This reaction was discovered during the course of investigating the peculiar property of rheumatoid sera in agglutinating sensitized sheep cells. As is shown in slide I, rabbit amboceptor in a subagglutinating dose effectively coats sheep cells providing a sensitized sheep cell which is agglutinated in the

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Slide I

presence of rheumatoid sera but not normal sera. Rose and co-workers in 1948, first brought our attention to this reactivity of rheumatoid sera. It has been noted in our laboratory that sensitized D-positive cells can be used in place of sensitized sheep cells. Slide II. Nonagglutinating (or incomplete) anti-D

sera are used to provide sensitized D-positive cells. These sensitized cells are not agglutinated in the presence of diluted normal sera but are strongly agglutinated by rheumatoid sera.

Slide II

Slide III

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As demonstrated in slide III, sensitized D-positive cells and sensitized sheep cells behave comparably with various rheumatoid sera. Those rheumatoid sera showing little or no activity with sensitized sheep cells showed little or no reaction with sensitized D cells, and as rheumatoid sera were found which showed greater reactivity with sensitized sheep cells, they also generally showed greater reactivity with sensitized D cells.

Slide IV

However, not all anti-D sera are capable of effectively sensitizing cells for this reaction. Slide IV. In this slide are illustrated the results obtained when a large number of anti-D sera of varying titers were evaluated for their ability to sensitize red cells to agglutination by rheumatoid sera. Of 53 sera with a titer less than 1:16, none was effective; at 1:16, 3 of 30 were effective. As sera with higher anti-D titers were examined, a greater proportion were found to be effective. Yet even at the highest titer, one serum did and one did not sensitize to the agglutination

Slide V

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reaction. These last two sera were studied in block titration, as can be seen in slide V. Despite the fact that both sera had very high and roughly comparable Coombs titers, the one failed and the other succeeded in effectively sensitizing the cell to the rheumatoid factor. No relationship could be established between the titer of blocking antibody and reactivity with the rheumatoid factor.

Thus it appears that rheumatoid sera having the ability to agglutinate sensitized sheep cells also have the ability to agglutinate D cells coated with antibody from certain anti-D sera. Another observation is to be noted, however. If Cohn Fraction II, highly purified gamma-globulin, is added in large amounts to rheumatoid sera, a precipitate is obtained and the capacity of the rheumatoid serum supernatant to agglutinate either sensitized sheep cells or sensitized D cells is reduced or lost. This

is shown in slide VI. When increasing amounts of Cohn Fraction II are added to the rheumatoid serum, the supernatants obtained show a reduction in activity, progressively greater as the amount of added Cohn Fraction II is increased. The

Slide VI

reduction in reactivity for sensitized sheep cells and for sensitized D cells runs parallel. It therefore appears that the factor which binds with and thereby causes agglutination of sensitized sheep cells and of D cells sensitized with certain anti-D sera is capable of being neutralized by a substance in Cohn Fraction II. Finally it can be shown, slide VII, that immune precipitates from rabbit serum when suspended in rheumatoid serum, will neutralize the rheumatoid serum reactivity with sensitized sheep cells, but not the reactivity with sensitized D cells. The present interpretation of these results and the previous results is that rheumatoid arthritis sera contain antibody to a constituent of human plasma, which sometimes appears in the coating material of sensitized D cells, and which has crossreacting

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specificity with a similar factor of rabbit serum which is present in the coating material of sensitized sheep cells and in the immune precipitates used. Because all anti-D sera of comparable titer do not behave similarly with respect to the rheumatoid factor it is necessary to hypothesize, slide VIII, either that there are two varieties of anti-D antibody, one capable and one incapable of reacting with the rheumatoid factor; or that there is a non-antibody accessory factor that may exist in certain anti-D sera, which makes possible this reaction. There is no data as yet to differentiate these possibilities.

Slide VIII

Alternative Hypotheses

There is no evidence to suggest that the rheumatoid factor will lead to incorrect typing of cells or to incorrect identification of serum antibody, but only that it might provide agglutination where not otherwise expected, when rheumatoid sera are used in suspending media.

Two A Antigens with Abnormal Serologic Properties*

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Abstract

Two examples of a blood group A with unusual properties are described. Although the red cells contain a strong A antigen, the cells fail to agglutinate with anti-A serum if routine tests are applied. The presence of a hidden A antigen was established by absorption and elution experiments and by the blocking test. The blood group was preliminarily called "Ag".

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