ribonucleic acid of the granules is obviously connected with the release of ATP and catecholamines. Similarly, the spontaneous release of catecholamines and ATP at 37° C could be due to a primary depolymerization of the ribonucleic acid by an intragranular ribonuclease. Further experiments showed that inactivated ribonuclease (denaturation by heating with 1 N hydrochloric acid in a boiling water bath for 90 min) neither depolymerizes ribonucleic acid nor releases catecholamines and ATP and that at 0° C no spontaneous release of catecholamines, ATP and ribonucleic acid takes place.

Also these observations favour the assumption that ribonucleic acid is of importance for the storage of ATP and catecholamines in the medullary granules and further that an intragranular ribonuclease may be responsible for the spontaneous release of these substances.

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HÆMATOLOGY

A 'New' Antibody Anti-Lu^aLu^b and Two Further Examples of the Genotype Lu(a-b-)

Mrs. L. B., the mother of two children, had a history of pulmonary tuberculosis for which a lobectomy had been performed in 1950 when a blood transfusion was given. In November 1961 it was decided to perform a thoracoplasty, but difficulty was encountered by the hospital's laboratory in selecting blood for transfusion during the operation. All available donor bloods proved incompatible, and the Transfusion Centre was asked to help.

The presence of the antibody was confirmed, and it soon became obvious that it gave an extremely high incidence of positive reactions. Eventually two red cell samples giving negative reactions were found. These were both of the genotype Lu(a-b-) and from members of the family described by Crawford *et al.*¹.

Further typing of Mrs. L. B.'s cells showed them to be Lu(a-b-) also. Her full cell type was: A₂, Ms Ms, P₁+, cDE/cde, Lu(a-b-), kk, Le(a-b+), Fy(a+), Jk(a+b-).

In addition to positive results obtained against all commonly available red-cell genotypes, the serum reacted with all the following types of red cells, namely, Lu(a+b-), cDE/cDE, -D-/-D-, Wra, Swa, Ss-ve, Mia, Vw, Fy(a-b-), Pk, KK, Kp^b-ve, Ge-ve, Vel-ve, I-ve, Yt^a-ve.

Lu(a-b-) samples obtained from other members of the family described by Crawford *et al.* confirmed the specificity of the antibody, which reacted as anti-Lu^aLu^b.

The antibody reacts in saline at room temperature and 37° C and also reacts by albumin and antiglobulin techniques at 37° C.

Attempts to absorb anti-Lu^a and anti-Lu^b from the patient's serum were unsuccessful, both Lu(a+b-) and Lu(a-b+) cells removing all activity. It would appear that the antibody is cross-reacting and inseparable.

In a search for other Lu(a-b-) blood samples, 18,069 random group A and O donor red cell samples were tested with the patient's serum. Only one donor, Mrs. S. H., was found to be compatible, and she proved on examination to be a further example of the Lu(a-b-) genotype.

Mrs. S.H.'s red cells were of the type: O, NNSs, P₁+, CDe/CDe, Lu(a-b-), kk, Le(a-b+), Fy(a+), Jk(a+b+). No antibodies were detected in her serum.

Family investigations are being carried out in both cases and when complete will form the subject of a further report. Although no other Lu(a-b-) members of L. B.'s family have been found, dosage studies suggest that the mode of inheritance of the Lu antigens may be different from that in the original family described by Crawford *et al.* So far as is known, the original family, Mrs. L. B. and Mrs. S. H., are unrelated.

The fact that apparently no difficulty was encountered in providing blood in 1950 for Mrs. L. B., coupled with negative antibody findings during routine ante-natal tests in 1955, indicates that the antibody has almost certainly developed since 1955. Immunization may have followed transfusion or pregnancy.

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Haptoglobins and Transferrins in Forensic Bloodstains

If the haptoglobin groups in human serum, detected first in 1959 by Smithies¹⁻³ using starch-gel electrophoresis, could be detected in stains of whole blood this would yield a useful means of grouping bloodstains in addition to the usual ABO system and, therefore, give a greater possibility of identification or exclusion. I have found that this is possible using the technique described here.

Starch blocks were prepared according to the modified method of Poulik⁴, using a discontinuous buffer system. The gel buffer was composed of *tris*(2-amino-2-(hydroxymethyl)-propane-1:3-diol) 0.076 M, citric acid 0.0005 M. The tank buffer was composed of boric acid 0.3 M, and sodium hydroxide 0.05 M.

Many methods of treating the sample to prepare it for insertion into the gel were tried. The first was to extract a bloodstain with a minimal quantity of the *tris*-citrate buffer and take up this extract on to a 10 mm × 4 mm piece of Whatman 3 MM filter paper: this being inserted into the slot in the gel. The results obtained from this method showed that there was selective extraction of albumen and haemoglobin: the globulins not extracting so well. Attempts were made to use this apparent selection as a means of enhancing the proportion of haptoglobin material. The results showed that there was removal of globulins to an extent which counter-balanced the enhancement which was sought. Hence a direct method was tried.

A piece of blood-stained cloth 1 cm × 3-4 mm was cut out from the stain and soaked in just sufficient *tris*-citrate buffer to soak the cloth. It was allowed to soak in a moist chamber at room temperature for 1.5-2 h. After this the piece of cloth was inserted into the slot in the starch gel. No improvement on this simple method could be obtained by various methods of concentrating the globulins from an extract of the stain. A potential of 6 V/cm was then applied to the gel for 3.5-4 h. After slicing the gel in half it was stained with benzidine