Gerbich Blood Group System: a Useful Genetic Marker in Certain Melanesians of Papua and New Guinea

THE red cell antigen Gerbich (Ge^a), thought to be among the most widely distributed of blood group antigens, was first noted in 1960 when three women who lacked the antigen made anti-Ge^a in response to pregnancy[1]. Subsequently a further fourteen Ge(a−) subjects were discovered through the presence of anti-Ge^a in their serum, the antibody selecting them out of perhaps millions. The seventeen propositi were from ten different countries and were of European, Mexican, South American Indian and Negro extraction. Some of the sibs of these propositi were also Ge(a−), but outside their families no Ge(a−) subject was found in testing nearly 40,000 random people, chiefly Europeans but including more than 1,000 Negroes and more than 100 Asiatics[1,2]. The antigen was shown to be a dominant character and its locus to be genetically independent of those responsible for most of the established blood group systems[2].

A native of New Guinea, Mrs Imp., previously transfused after a post-partum haemorrhage, needed a transfusion after the birth of her second child and was found to have a strong immune IgG type antibody, which reacted with the cells of all of 700 samples from white people in Port Moresby and Brisbane: it did not react with the cells of thirteen of 371 random natives from widely spread places in Papua and New Guinea. In London, Mrs Imp. was, surprisingly, found to be Ge(a−) and her antibody to be anti-Ge^a. (Mrs Imp. does not belong to the very rare subtype[2] of Ge(a−) known as "Yus".)

Gene frequencies calculated from the 371 random Melanesian people would be misleading, for it is noteworthy that eleven of the thirteen Ge(a−) people live on the north-east coast line between Lae and Samarai. These eleven Ge(a−) coastal natives belong to at least six well recognized ethnic groups, from whom only fifty-two samples have so far been tested. Tentative gene frequencies along this strip of coast are therefore *Ge*^{a} 0·54 and *Ge* 0·46, a startling divergence from the *Ge*^{a} 1·00 and *Ge* 0·00 of the rest of the tested world.

Mrs Imp.'s husband, mother-in-law and child are also Ge(a−): she and her husband's family come from a village about 100 miles from Lae up the Markham Valley, and have no known coastal affinities. The Markham Valley is sparsely populated, however, and movement along it from the coast would have presented no problems.

We hope that this brief report may encourage those involved in surveying blood groups of remote people to include tests for antigens, such as Ge^a, known in a different part of the world to be possessed by virtually everyone and therefore thought incapable of providing any useful genetical information. Extensive testing of Melanesians is now planned, but the relatively small investigation recorded here was sufficient to bring to light a most dramatic difference in the frequencies of the Gerbich blood group genes.

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Lymphocyte Stimulation by Bovine β-Lactoglobulin

In vitro stimulation of lymphocytes, by either specific or non-specific mitogens, is accompanied by increased DNA synthesis[1]. During a study of milk sensitivity in ten patients with gastrointestinal disease (including seven with coeliac disease) it was observed that β-lactoglobulin had a mitogenic activity of the same order as phytohaemagglutinin (PHA) both in patients and in five healthy controls.

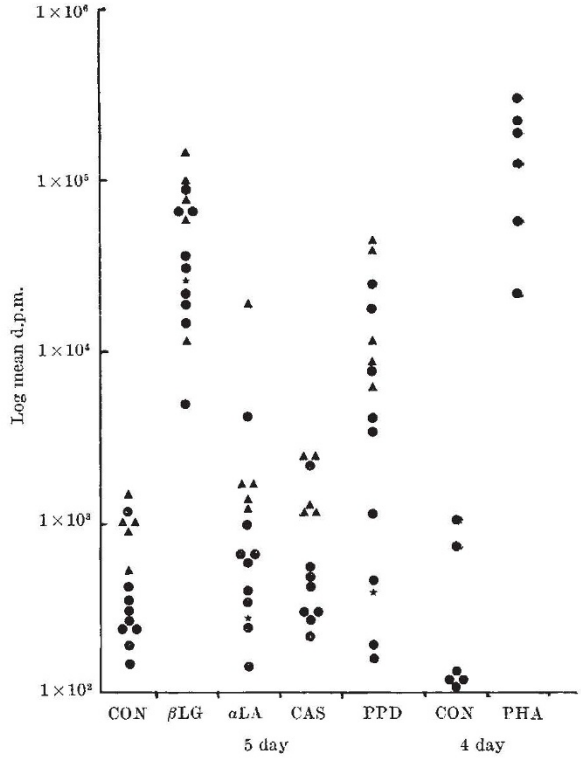

Fig. 1. DNA synthesis expressed as log mean disintegrations per min (log mean d.p.m.) for healthy controls (▲) and patients (●) with gastrointestinal disease. Control cultures (CON) containing no stimulant are compared with cultures containing 2 mg KL β-lactoglobulin (βLG), 2 mg KL α-lactalbumin (αLA), 2 mg BDH casein (CAS), 10 μg PPD or 0·033 ml. phytohaemagglutinin (PHA). The cultures of 1 patient ★ were all harvested on the fourth day.

Bovine β-lactoglobulin AB[2] and α-lactalbumin were purchased from Koch–Light (KL) Laboratories and β-lactoglobulin AB and casein hydrolysate were purchased from BDH. Bovine β-lactoglobulin AB, A and B, α-lactalbumin, casein and whole-whey protein were provided by Dr R. G. J. Lyster of the National Institute for Research in Dairying, Shinfield, Reading. Bovine β-lactoglobulin AB was prepared by Dr G. Pardoe of this department using pooled unpasteurized cow's milk within 24 h of collection. The milk was defatted by centrifugation at 4° C. PHA was purchased from Burroughs Wellcome. The contents of each ampoule were dissolved in 5 ml. of phosphate-buffered saline; 0·033 ml. was added per culture. Tuberculin purified protein derivative (PPD) was provided by the Ministry of Agriculture, Fisheries and