

ALLERGEN STANDARDISATION USING LECTINS

SIR,—A serious objection to much diagnostic and investigative work done in allergy is that the allergen preparations used are complex, unstandardised mixtures of allergenic, inert, and sometimes irritant components. Allergen extracts prepared by different procedures and marketed by different firms may vary considerably in composition and content of allergenic materials.¹⁻³ This will influence skin tests, bronchial provocation tests, the radioallergosorbent test (RAST) and so on, as well as any proposed hyposensitisation therapy. The uncertainty surrounding most allergen preparations is frequently highlighted by the use of meaningless indices of potency such as weight/ml and protein-nitrogen units. Such uncertainty is unacceptable.⁴

Although it is the biological properties of purified allergens which are of interest, biological standardisation methods are often difficult in practice, especially if a quantitative estimation is sought. For some allergens the selection and availability of suitable numbers of patients for in-vivo testing is an added difficulty. In-vitro methods are often more convenient, but they must correlate with the biological methods for allergen testing. If rapid progress is to be made in the standardisation of allergen extracts in clinical use, much more work must be done on allergen purification. The availability of purified allergens allows them to be characterised physicochemically and immunologically, but even when purified allergens have been obtained and subjected to biological quality testing and standardisation, some technical problems remain. For example, what convenient and accurate method can be used to standardise the content of the particular allergen in the wide range of crude extracts which may be available and used internationally, and what will be the primary standards? No single in-vivo or in-vitro method is generally applicable. Laboratory methods such as radial immunodiffusion, crossed immunoelectrophoresis, radioimmunoassay, methods involving histamine release, direct and indirect RAST, and isoelectric focusing in gel followed by direct RAST have all been studied.⁵ Of these, the RAST-based techniques look most promising. We have shown that purified lectins⁶ isolated from plants and invertebrates are valuable and widely applicable reagents for use in allergen isolation and purification studies.^{7,8} Lectins can be prepared in a highly purified form, and, unlike antibodies, they are frequently homogeneous in composition, combining-site size, and specificity. The specificity shown by lectins for certain monosaccharides commonly found in nature and the widespread distribution of these sugars in the terminal positions of many natural polysaccharides and glycoproteins means that these "anti-carbohydrate" reagents often react with a wide range of soluble and cell-bound saccharide-containing macromolecules. We isolate the lectin-reactive component from the crude extract and assess its allergenic activity by skin tests, RAST, histamine-release techniques, and so on. If the lectin-reactive component is allergenic, then the purified lectin can be used to assess the levels of that component in crude extracts, usually by using a radioactive binding procedure with ¹²⁵I-labelled lectin. We are now studying lectin-reactive components from house-dust mites, some parasites, pollens, fungi and foods.⁸

Several lectins have now been well characterised by size, combining-site size and specificity, aminoacid composition, metal and pH dependence, and subunit composition. The homogeneity of these antibody-like proteins and the lack of variation from batch to batch, make lectins, unlike anti-

bodies, suitable reagents for use as primary standards in allergen standardisation work.

Princess Margaret Children's Medical
Research Foundation,
Princess Margaret Hospital For Children,
Perth, Western Australia 6008

B. A. BALDO

Department of Immunobiology,
Medical University Clinic,
Köln-Lindenthal, West Germany

G. UHLENBRUCK

NECROTISING ENTEROCOLITIS

SIR,—Necrotising enterocolitis of the newborn (N.E.C.) seems primarily to be caused by ischaemia of the bowel wall, predominantly affecting infants of low birth-weight. Several conditions predisposing to N.E.C. are listed in your editorial (Feb. 26, p. 459). Sometimes N.E.C. develops in nearly full-term infants even when none of the known predisposing factors are present.^{1,2} I describe here twins, one of whom had severe N.E.C., extending to the whole ileum and half of the colon and complicated by ileal perforation.

A 28-year-old woman delivered female non-identical twins in the 34th week of her second pregnancy. Birth-weights were 1770 and 1685 g. Pregnancy and delivery were free of complications except for premature rupture of the first twin's membranes 4 days before delivery. Both twins were given ampicillin and gentamicin for 5 days. On the second day of life feeding of a milk formula simulating breast milk ('Humana O') through nasogastric tubes was started. For 2 days additional parenteral infusions were given through scalp veins. On the 7th day of life both infants got 160 ml milk/kg body-weight daily. The second twin was regurgitating a little and showed some delay of gastric emptying. She was continuously fed via a nasogastric tube. Her stools were normal and she looked well. On the 9th day she had three diarrhoeic stools and five normal stools, but on day 10 all stools were normal, after the milk was in part replaced by tea. On day 13 her condition suddenly changed: her skin became grey, her abdomen enlarged and she passed bloody stools. A plain X-ray showed pneumatosis intestinalis and bowel distention. Oral feeds were discontinued, the stomach was kept empty by aspiration, and treatment with ampicillin and gentamicin was started immediately. In the first hours she had several attacks of apnoea. After 24 h signs of pneumatosis disappeared, but small-bowel distention persisted. 2 days later her condition deteriorated; again her abdomen enlarged, she turned grey, and had several episodes of apnoea. X-ray showed free air in the peritoneal cavity. At laparotomy, air and faecal matter was found in the peritoneal cavity. The small bowel and ascending and transverse colon were swollen with oedema and in part deep purple from haemorrhagic necrosis; there was a perforation in the distal ileum. The perforated gut was removed and an end-to-end anastomosis was performed.

From stomach aspirates and pharyngeal swabs *Enterobacter cloacae* was isolated, while anal swabs revealed *Staphylococcus albus* and *Escherichia coli* as well. Cultures of blood remained sterile. Preoperative cultures from the peritoneal cavity showed *Enterococcus* and *E. cloacae*, and *Clostridium perfringens* by anaerobic technique. Stool cultures of the first twin remained sterile.

Postoperatively, the infant did well, and several days later oral feeding was carefully reintroduced. At 7 weeks of age the child was discharged weighing 2600 g. The first twin gained weight well all the time although she regurgitated a little as did her sister. When N.E.C. was diagnosed in the sister her stools were tested for occult blood (Ames) daily. There were some

1. Baer, H., Godfrey, H., Maloney, C. J., Norman, P. S., Lichtenstein, L. M. *J. Allergy*, 1970, **45**, 347.

2. Aas, K., Belin, L. *Acta allergol.* 1972, **27**, 439.

3. Foucard, T., Johansson, S. G. O., Bennich, H., Berg, T. *Int. Archs Allergy*, 1972, **43**, 360.

4. Aas, K. *Devel. Biol. Standard.* 1975, **29**, 341.

5. Yman, L., Ponterius, G., Brandt, R. *ibid.* p. 151.

6. Lis, H., Sharon, N. A. *Rev. Biochem.* 1973, **42**, 541.

7. Baldo, B. A., Turner, K. J., Uhlenbruck, G. *Experientia*, 1976, **32**, 641.

8. Baldo, B. A., Uhlenbruck, G. Unpublished.

1. Flynn, D. M., Howard, F. M., Bradley, J., Noone, P. *Lancet*, 1977, **i**, 545.

2. Polin, R. A., Pollack, P. F., Barlow, B., Wigger, H. J., Slovis, T. L., Santulli, T. V., Heird, W. C. *J. Pediatr.* 1976, **89**, 460.

3. Pedersen, P. V., Hansen, F. H., Halveg, A. B., Christiansen, E. D., Justesen,

* T., Høgh, P. *Lancet*, 1976, **ii**, 715.