Diabetologia 2, 133 (1966)

REPORTS FROM MEETINGS

Antibodies to Insulin

A one-day colloquium on the Immunology of Insulin, sponsored and arranged by the British Insulin Manufacturers (Allen & Hanburys Ltd, Boots Pure Drug Co. Ltd, British Drug Houses Ltd, and Burroughs Wellcome & Co. [The Wellcome Foundation Ltd]), was held in the rooms of the Society of Chemical Industry, London, on 16 September 1965. The sixty or so participants invited included a number of guest speakers from abroad, as well as biochemists, immunologists, pathologists and clinicians drawn from universities, hospitals, government laboratories and commercial establishments in various parts of the British Isles. Dr. J.H. HUMPHREY, F.R.S., was in the Chair.

The first paper, by Dr. E.R. ARQUILLA (Los Angeles), described the discovery that antibodies to insulin produced in differing strains of rabbits or guinea-pigs may vary in the parts of the insulin molecule to which they are directed. Breeding experiments then showed that the configuration of the combining sites of guinea-pig antibodies to insulin is controlled by more than one gene rather than by alleles at a given gene locus. Dr. ARQUILLA'S finding, in the course of these studies, that a large portion of [^{125}I]-iodinated insulin (one atom iodine per mole) did not react with certain antibodies and was also biologically inert brought into question once again the validity of iodine labelling for tracing insulin *in vivo*; in addition it could be deduced that the integrity of the C-terminal region of the A-chain of insulin is important for biological activity.

Three papers on the comparative immunochemistry of insulin were presented. Professor S. FALKMER (Umeå) compared the chemical and biological properties of insulins from a wide range of terrestrial and aquatic vertebrates, showed that there is a general relationship between immunological behaviour and phylogenetic order, and demonstrated that non-vertebrates (the sea squirt and the starfish) also possess immunologically competent insulin. Dr. C.N. HALES (Cambridge) correlated the structures and immunological reactivities of various mammalian insulins and described how guinea-pig antisera to ox and to human insulin could together be used to identify and assay ox insulin in human plasma. Dr. W.G. OAKLEY (London) discussed the response of diabetic patients exhibiting insulin resistance ascribable to antibodies when treated with steroids and with insulin of another species (pig in place of ox) or sulphated insulin. The ensuing discussion of these papers was notable for the announcement by Dr. L.F. SMITH (Cambridge) of the structure of guinea-pig insulin, no less than one-third of the amino-acid residues of which are different from those in most other mammalian insulins of established structure.

Dr. K.W. TAYLOR (London) introduced the topic of insulin antibodies as research tools and described from his own experience their use for the identification of insulin in mixtures such as serum by biological techniques *in vitro* and for the purification by precipitation methods of labelled insulin in studies of its biosynthesis. Other aspects of the practical uses of antibodies to insulin were dealt with by Dr. P.C. RISDALL (Nottingham), on micromethods for the detection of insulin by the precipitin reaction, and by Dr. N.F. CUNNINGHAM (Weybridge), on the induction of acute insulin deficiency, with particular reference to sheep and cows. Professor A.C. CUNLIFFE (London) compared the results of different methods of assay of insulin antibodies, as applied to sera from human resistant diabetics.

The last session, under the provocative heading of auto-immunity and diabetes, opened with three papers on essentially experimental aspects by Dr. T. DECKERT (Copenhagen), Dr. CAROLINE B. MANN (Beckenham) and Professor A.E. RENOLD (Geneva), the subjects being humans, guinea-pigs, and cattle and sheep resprectively. In each study antibodies were engendered to, or which reacted with, homologous insulin, although only in the last was any evidence of associated pathologic change adduced, viz., insulitis in the pancreases of immunised cows and sheep. Dr. DECKERT concluded that antibody production to homologous insulin may be a consequence of the subcutaneous injection and Dr. MANN speculated that homologous pancreatic insulin may be altered, and thereby rendered antigenic, by the extraction procedure. A valuable comparative survey of other auto-immune conditions by Dr. I.M. ROITT (Lonton) then followed. The session ended with a panel discussion on the topic of auto-immunity and diabetes led by Professor RENOLD, during which Professor E.F. PFEIFFER (Frankfurt) drew attention to the importance of considering anti-insulin antibody fixed to lymphocytes and Dr. GEPTS gave data on the incidence of insulitis in untreated juvenile diabetic patients. In summing up the panel discussion and the preceeding papers Professor RENOLD concluded that there seems to be as yet no definite evidence implicating auto-immune phenomena in the pathogenesis of diabetes — except for the 'cornerstone' of insulitis — but at the same time there still remain unanswered the questions of exactly what substance should be used for the treatment of diabetes and what specific hormone is secreted by the pancreas.

Fuller proceedings of the colloquium will not be published.

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