An Antigen in Lesions of Molluscum Contagiosum

OUCHTERLONY's technique of agar diffusion¹ has made it possible to demonstrate the presence of certain viral antigens and antibodies not identifiable by other serological means. Datt and Orleans², in 1958, found an antigenic substance common to vaccinia and pig pox; Taylor-Robinson and Rundle³ have demonstrated a common antigen in chicken pox and herpes zoster. These successes prompted a re-investigation of the antigenicity of molluscum contagiosum, a large virus that produces benign skin tumours in man.

The method of Taylor-Robinson and Rundle³ was used. Skin curettings of molluscum lesions were pooled, ground and lyophilized to give a crude antigen. Four different antigen samples were prepared; 50–150 lesions from two to five patients comprised each sample. The donors were used only once; no anaesthesia was required. The antigen suspended in saline, 3–4 mgm./ml. or 30–40 mgm./ml., was put in the central reservoir of agar plates prepared for immunological study (1 per cent (w/v) Difco agar dissolved in isotonic saline and phosphate buffer pH 7.3 and containing merthiolate 1:10,000; wells 11 mm. apart and 5 mm. deep). Sera from (1) patients infected with molluscum contagiosum; (2) adults without the disease, and (3) uninfected children were put in surrounding wells. The plates were examined daily for 2–3 weeks.

A single precipitation band (Fig. 1) appeared in 9 of 21 patients (43 per cent), 8 of 73 adults (11 per cent), and 0 of 11 children, and was usually evident within 48 hr. Weak concentrations of antigen (4 mgm./ml.) gave positive reactions only with sera from patients having numerous (more than 50) lesions of molluscum contagiosum. All antigens displayed equal activity. Comparable concentrations of lyophilized normal skin curetted from the same donors or from normal subjects gave consistently negative results. Ground, lyophilized human warts showed no antigenicity in this system. Of the positive reactors in the adult group, four had markedly raised serum globulin-levels related to multiple myeloma or internal cancers. A fifth subject with a high serum γ -globulin had a history of infectious hepatitis. One additional subject had a false-positive serological test for syphilis without a significant electrophoretic abnormality. These alterations were absent in sera from patients with molluscum contagiosum.

These findings indicate the presence of an antigen capable of inducing antibody formation in the lesions of molluscum contagiosum. This may conform to the

heat-labile antigen-antibody system reported by Mitchell⁴; he noted weak complement fixation reactions of crude molluscum antigen with sera from 3 of 14 patients infected with the virus. About half our patients with the disease had demonstrable antibodies; they were more prevalent in those patients with extensive lesions. While the positive reactions in adults can be explained on the basis of prior unrecognized infection⁵, it seems curious that 50 per cent of the positive reactors had high serum globulin associated with internal malignancy; the possibility exists that a cross-reacting tumour antibody gave the observed precipitation bands. The non-infected children had been confined to an isolated ward and presumably had never been exposed to molluscum contagiosum.

Work is in progress to determine whether the crude antigen is a purely viral substance or an altered tissue antigen.

This work was supported in part by a grant from the Committee on Research, University of California School of Medicine.

WILLIAM L. EPSTEIN
IRENE P. SENEAL
ALAN M. MASSING

Division of Dermatology, Department of Medicine,
University of California School of Medicine,
San Francisco.

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Leukæmia in the Progeny of Mice inoculated with a Leukæmogenic Virus

TEN years ago Gross first reported a raised incidence of leukæmia in mice of a low-leukæmic strain (C3H) inoculated when newly born with a cell-free extract of leukæmic tissue from a high-leukæmic strain (AK)¹. He also observed a raised incidence in the progeny of the inoculated mice². Since then, the first observation has been several times confirmed, but the second has not been reported from any other laboratory.

In the course of recent work in this Department on another leukæmogenic agent, the virus which Moloney isolated from the sarcoma 37³, several groups of stock albino mice ('Schofields') were injected when newly born with cell-free filtrates prepared from tissues of leukæmic mice of various breeds which had received a tissue culture-passaged sample of Moloney's virus⁴. In one experiment a new-born litter of 7 stock albinos (2♂, 5♀) were injected with such a filtrate. Leukæmia began to appear at 12 weeks of age, and 6 mice had developed leukæmia by 20 weeks. Before the appearance of the first leukæmia the mice were brother-sister mated; of their progeny of 18 (9♂ and 9♀) born when the parents were approximately 9 weeks old, 11 have become leukæmic between the 11th and 20th week of age. In the second experiment 7 new-born litters of stock albinos (a total of 46 mice) were inoculated with another filtrate. Leukæmia began to appear at the 11th week, and the incidence reached 50 per cent at 21 weeks. Among the mixed progeny (total 27) of these 7 litters, also born when their parents were about 9 weeks old, 9 leukæmias have appeared between the 11th and 20th week of age.

Fig. 1. Drawing of agar diffusion plate (effect on original photograph was too faint for satisfactory reproduction). Centre well contains crude antigen No. 3. Surrounding wells contain sera: (1) adult, (2) uninfected child, (3) child with multiple lesions of molluscum contagiosum, (4) adult with less than 25 lesions