

Eye Hypersensitivity Elicited by *Monilia Psilosis* Polysaccharide.

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In studies on sympathetic ophthalmia, Woods¹ sensitized one eye of dogs by injecting uveal pigment into the vitreous humor and observed an inflammatory reaction in both eyes on subsequent intraperitoneal injection of the same antigen. By injecting horse serum about the iris, Riehm² succeeded in sensitizing the rabbit eye so that subsequent intravenous injection of the antigen produced a bilateral uveitis. In their work on local organ hypersensitiveness Seegal and Seegal³ sensitized the anterior chamber of the rabbit eye with various protein antigens, and later obtained local reactivation by intravenous administration of the homologous antigen.

Inasmuch as the substances heretofore used to sensitize and reactivate the eye have been protein in nature, a similar experiment is reported, using as the reactivator a polysaccharide fraction⁴ prepared from the yeast-like fungus *Monilia psilosis*, Ashford. The organism itself was used as sensitizer, since the uncombined bacterial polysaccharides have been found to be non-antigenic. Suspensions of washed heat-killed monilia organisms, both intact and ground, were injected into the anterior chamber of one eye of each of 12 rabbits* after removal of a somewhat greater volume of aqueous humor. Control animals were given sterile saline or a 5% saline solution of the monilia polysaccharide. At various intervals (2 weeks to 8½ months) after the original injection, and after the transitory inflammatory reaction had subsided, monilia polysaccharide, usually 50 mg. in 5% solution, was injected into an ear vein. When a positive reaction occurred, it reached a maximum in 5 to 7 hours after the injection, and was characterized by marked

¹ Woods, A. C., *Arch. Ophth.*, 1918, **47**, 161; *J. Am. Med. Assn.*, 1921, **77**, 1317.

² Riehm, W. D., *Med. Woch.*, 1929, **55**, 907.

³ Seegal, D., and Seegal, B. C., *Proc. Soc. Exp. Biol. and Med.*, 1930, **27**, 390.

⁴ Cook, D. H., Kesten, H. D., and Jobling, J. W., *Proc. Soc. Exp. Biol. and Med.*, 1930, **27**, 562; Kesten, H. D., Cook, D. H., Mott, E., and Jobling, J. W., *J. Exp. Med.*, 1930, **52**, 813.

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hyperemia of the circumcorneal conjunctival vessels and often of the vessels of the iris and nictitating membrane.

The usual incubation period of 2 weeks was not sufficiently long for reactivation of the eye to be successful. This was probably due to the continued presence of antigen in the eye. Antigen was often visible grossly for as long as 10 days. One positive eye reaction was noted at the end of 2 months. Tested 4 or 4½ months after the original eye injection, 5 of the 12 rabbits exhibited a positive reaction in the sensitized eye. The opposite eye was invariably negative and served as a control. Of these 5 animals one was positive as well at the end of 2 months and of 4 months. Control animals were negative, as were also those rabbits sensitized with monilia but given monilia bodies intravenously instead of polysaccharide. One of the latter exhibited a definite eye reaction 2 weeks later when given polysaccharide. Five animals tested at 8½ months were negative, although 3 of these had yielded good reactions at 4 months. No difference was noted between rabbits sensitized with whole and with ground monilia.

Inasmuch as the polysaccharide fraction used in the work contained, as previously reported,⁴ a small amount of nitrogen (averaging 0.6% in the samples used), it cannot be stated unqualifiedly that the monilia-sensitized rabbit eye can be reactivated by subsequent intravenous injection of the homologous protein-free polysaccharide. The negative character of protein tests would indicate, however, that very little, if any, of the nitrogen is present as protein. Furthermore, nitrogen-free pneumococcus carbohydrate has been found capable, by Avery and Tillett,⁵ of producing anaphylactic shock in passively sensitized guinea pigs. We are inclined, therefore, to interpret the eye reaction to the monilia substance as another manifestation of the ability of a bacterial hapten to elicit an immune reaction in the properly sensitized medium, in this case the actively sensitized eye.

⁵ Avery, O. T., and Tillett, W. S., *J. Exp. Med.*, 1929, **49**, 251.