

Okazaki W, Purchase H G & Burmester B R. Protection against Marek's disease by vaccination with the herpesvirus of turkeys. *Avian Dis.* 14:413-29, 1970.
[US Dept. Agriculture, Regional Poultry Res. Lab., East Lansing, MI]

A virus isolated from turkeys, the herpesvirus of turkeys (HVT), which was nonpathogenic in chickens, was shown to protect chickens against Marek's disease (MD), a contagious, economically important cancer of chickens. Furthermore, the HVT infection persisted in the vaccinated chickens but did not spread to chickens in direct contact with them. [The SCJ[®] indicates that this paper has been cited in over 205 publications since 1970.]

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"The research that led to this paper began the most exciting and rewarding time of my life. The period started when Dick Witter came to me with the suggestion that, using the indirect fluorescent antibody test, I look at a new virus he had just isolated from turkeys¹ that was nonpathogenic for chickens. He asked others in the laboratory to examine the virus in the immunodiffusion test. The tests showed the turkey herpesvirus (HVT) to be related but not identical to Marek's disease (MD) virus, a virus causing devastating cancer losses in the poultry industry.

"A project to develop a vaccine against MD had just been started at our laboratory under the leadership of Bill Okazaki. He was attempting to attenuate the MD virus and to isolate naturally apathogenic viruses from the field. An attenuated vaccine against MD

had just been reported in England. I recognized the potential of a vaccine for MD and with the encouragement of my close friend Dick, I approached the director, then Ben Burmester, to give me the leadership responsibility for the program to develop a vaccine. I became leader of a three-person team comprised of Okazaki, a visiting Israeli scientist, and myself. We designed and conducted a series of experiments that demonstrated that the HVT was a highly effective vaccine against MD. In the initial paper reported here, I was struck by the dramatic protection offered by HVT and it reminded me of the work of Pasteur on anthrax reported by Paul De Kruif in *The Microbe Hunters*.² I did most of the writing for this paper but made Okazaki first author in recognition of the fact that he was the initiator of the vaccine program at our laboratory.

"The paper received the Research Paper Award, now known as the P.P. Levine Award, for the best paper published in *Avian Diseases* in 1971. The laboratory and the team that conducted the research were recipients of several other awards. The government took out a general use patent and has licensed many vaccine producers to produce the HVT vaccine, which is now used worldwide. Expenditures by federal, state, and other agencies and industry on avian tumor virus research were almost \$30 million since the turn of the century, yet the benefits in the US from the research amounted to over \$168 million for 1974 alone, a benefit-cost ratio of 44.³ In addition, MD is the first cancer of any animal for which a commercially applicable vaccine was developed. It is referred to as a model by workers with oncogenic herpesviruses of humans,⁴ primates, and frogs. I feel sure that the originality and economic impact of the discovery were the reasons that it was cited so often."

1. Witter R L, Nazerian K, Purchase H G & Burgoyne G H. Isolation from turkeys of a cell-associated herpesvirus antigenically related to Marek's disease virus. *Amer. J. Vet. Res.* 31:525-38, 1970.
[Citation Classic. *Current Contents/Agriculture, Biology & Environmental Sciences* 11(2):10, 14 January 1980.]
2. De Kruif P. *The microbe hunters*. New York: Harcourt, Brace, 1926. 363 p.
3. Purchase H G. The etiology and control of Marek's disease of chickens and the economic impact of a successful research program. *Virology in agriculture: invited papers presented at a symposium held May 10-12, 1976, at the Beltsville Agricultural Research Center, Beltsville, Maryland.* Montclair, NJ: Allanheld, Osmun, 1977. p. 63-81.
4. Prevention of Marek's disease: a review. *Cancer Res.* 36:696-700, 1976.