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QUANTITATIVE CHARACTERISTICS OF ANTIGENIC RELATIONSHIP BETWEEN AVIAN PARAMYXOVIRUSES

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A combinatorial mathematical model describing the experimentally found diverse antigenic interconnections between different avian paramyxovirus (PMV) serotypes (Lipkind and Shihmanter, submitted) is presented. According to the model, the whole network of the antigenic interconnections is determined by the specific combinatorial sets of antigenic determinants, some of them being serotype-specific and the others being common with some other avian PMV serotypes. The suggested model is based on the postulates concerning PMV virion structure; bifunctional organization of PMV HN glycoprotein, its amount per virion and a mechanism of antibody-caused inhibition of its functional activities; a definition of an antigenic determinant as an elementary unit inducing and reacting only with a homologous type of antibodies.

The suggested model through operating with mathematically expressed different definitions of antigenic kinship describes some experimental phenomena connected with interserotype antigenic relationships, especially, the well known hitherto unexplainable phenomenon of asymmetric cross-reactivity.

VACCINATION OF TURKEYS AGAINST HEMORRHAGIC ENTERITIS USING LIVE AND INACTIVATED VACCINES

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Three isolates of hemorrhagic enteritis virus (HEV) were isolated from the litter of 10 turkey flocks which were serologically positive but clinically negative to the disease. Groups of 6 wk. old turkeys were infected with these isolates and kept in isolation units. No clinical signs were seen but the birds developed antibodies. One of the isolates was subsequently the subject of further experiments. Safety tests were conducted on 520 6—10 wk. old turkeys. No clinical signs were observed during a three week observation period following administration of the virus. The antibody levels and degree of protection against virulent challenge were measured in 3 groups of birds after administration of live, inactivated and inactivated followed one week later by live vaccine. The challenged control group of 20 birds showed a mortality of 10% and morbidity of 45%, while no abnormal signs were seen in the vaccinated groups. The antibody titres were highest in the double vaccinated group and lowest in the challenged birds.

The virus causes marked splenomegaly 5 to 8 days after challenge. Two additional trials were designed in which groups of 20 turkeys,6 or 8 ½ weeks old, were vaccinated