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ANTIGENIC ANALYSIS OF THE HEMAGGLUTININ OF H4 INFLUENZA VIRUSES USING MONOCLONAL ANTIBODIES

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An operational antigenic map of the hemagglutinin of A/budgerigar/Hokkaido/1/77 (H4N6) was established using monoclonal antibodies by competitive binding assay and comparative antigenic analysis of antigenic variants, which were selected in the presence of monoclonal antibodies. From the results obtained, three antigenic regions were defined.

The frequency of isolation of antigenic variants from an avian influenza virus, A/budgerigar/Hokkaido/1/77, varied with the monoclonal antibody used for selection within the range $10^{-5.17}$ to $10^{-7.67}$. These figures were not different from those obtained with monoclonal antibodies to human (H1 and H3) and seal (H7) influenza viruses.

Antigenic relationship among 25 H4 influenza viruses, which were isolated from a variety of bird species in different districts of the world, was examined by HI tests and ELISA binding assays using monoclonal antibodies directed to different antigenic regions. Some of the monoclonal antibodies showed positive in ELISA, but were negative in the HI test with H4 influenza viruses. These findings suggest that there are some antigenic determinants to which antibody binding failed to inhibit hemagglutination on H4 hemagglutinins. In two out of three antigenic regions there were antigenic determinants which were specific to the isolates from budgerigars and mynahs. Antibodies to these regions neutralized viral infectivity, while those to the other region did not show the neutralization activity and were cross-reactive with almost all of the H4 influenza viruses tested.