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STRUCTURE AND FUNCTION OF RNA POLYMERASE
OF INFLUENZA A VIRUS
—ANALYSIS BY USING MONOCLONAL ANTIBODIES—

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Influenza A virus contains 8 genome segments of linear, negative sense and single stranded RNA. Genome RNA is associated with RNA-dependent RNA polymerase and nucleoprotein. The RNA polymerase consists of PB2, PB1 and PA proteins. These proteins play central roles in transcription, and replication of the viral genome. To provide information on the mechanism of transcription and replication of the influenza A virus genome, the structure and function of the RNA polymerase were analyzed using monoclonal antibodies in the present study.

Twelve anti-PB2, six anti-PB1, and three anti-PA monoclonal antibodies were established. Using anti-PB2 and anti-PB1 monoclonal antibodies, antigenic sites of each protein were defined by competitive binding assay. The antigenic relationships among 8 influenza viruses isolated from different species were examined by Western blotting. Reactivity patterns of PB2 and PB1 with panels of monoclonal antibodies revealed that the antigenicity of the RNA polymerase was conserved among these viruses except for 2 strains of equine origin. These monoclonal antibodies were tested for their ability to inhibit transcription by the RNA polymerase. Three monoclonal antibodies to the PB2 inhibited the transcriptase activity.

The present results indicate that the monoclonal antibodies to the PB2, PB1 and PA are useful for analyzing structure and function of the RNA polymerase of influenza virus.