THE STRUCTURE OF MAREK'S DISEASE VIRUS GENOME DNA IN TRANSFORMED LYMPHOBLASTOID CELL LINES MSB1 AND RP1 DERIVED FROM CHICKENS INFECTED WITH MAREK'S DISEASE

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Although both virus-productive and nonproductive cell lines contain multiple copies of the Marek's disease virus (MDV) genome, most of the viral gene expressions are repressed. The structures of MDV genome DNAs prepared from a virus-productive cell line, MSB1, and a nonproductive cell line, RP1, were analyzed by Southern blot hybridization techniques.

The restriction endonuclease BamHI cleavage pattern of MDV DNA from RP1 was almost the same as that of MDV DNA from MSB1. However, a 1.4 kbp band, which was unique to MDV DNA from RP1 and unexpected from the BamH1 restriction endonuclease map of MDV DNA, was observed. This 1.4 kbp band hybridized to the BamH1-H-EcoRI-a region. Since this region is flanked by the region which contains the sequences of the putative replication origin of MDV DNA in a lytic cycle, DNA rearrangement in this region of MDV DNA in RP1 might be responsible for the loss of the viral productivity.

When MDV DNAs prepared from nuclei of MSB1 and RP1 digested with micrococcal nuclease were analyzed by Southern blot hybridization using MDV-BamHI-H or -K_2 fragment as a probe, MDV DNAs from both RP1 and MSB1 showed the same nucleosomal patterns as shown in host cellular DNA. Therefore, the nucleosomal structure of MDV DNA may not be directly related to viral productivity in the lymphoblastoid cell lines.

Active genes in higher eukaryotes reside in the chromatin domain which are more sensitive to digestion by DNasel than those in inactive chromatin. In this context, mRNA were transcribed from the BamH1-A, -H, -I_2 and -L regions of MDV DNA in MSB1 and RP1 was shown. No difference was observed in the sensitivity to digestion by DNasel between active and inactive regions of MDV DNA in these cell lines.

When RP1 or MSB1 was treated with IUdR, the sensitivity of MDV DNA to DNasel markedly increased. These results suggested that the active regions of MDV DNA might be characterized as an insensitivity to digestion by DNasel. However, when the cells were treated with IUdR, the chromatin structure might be changed into a structure sensitive to digestion by DNasel.