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Interaction of gamma-herpesvirus genome maintenance proteins with cellular chromatin

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The capacity of gamma-herpesviruses to establish lifelong infections is dependent on the expression of genome maintenance proteins (GMPs) that tether the viral episomes to cellular chromatin and allow their persistence in latently infected proliferating cells. Here we have characterized the chromatin interaction of GMPs encoded by viruses belonging to the genera *Lymphocryptovirus* (LCV) and *Rhadinovirus* (RHV). We found that, in addition to a similar diffuse nuclear localization and comparable detergent resistant interaction with chromatin in transfected cells, all GMPs shared the capacity to promote the decondensation of heterochromatin in the A03-1 reporter cell line. They differed, however, in their mobility measured by fluorescence recovery after photobleaching (FRAP) and in the capacity to recruit accessory molecules required for the chromatin remodeling function. While the AT-hook containing GMPs of LCVs were highly mobile, a great variability was observed among GMPs encoded by RHV, ranging from virtually immobile to significantly reduced mobility compared to LCV GMPs. Only the RHV GMPs recruited the bromo- and extra terminal domain (BET) proteins BRD2 and BRD4 to the site of chromatin remodeling. These findings suggest that differences in the mode of interaction with cellular chromatin may underlie different strategies adopted by these viruses for reprogramming of the host cells during latency.

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