Medical Xpress

Researches identify herpesvirus proteins that target key cellular processes

July 11 2008

A study published July 11th in the open-access journal *PLoS Pathogens* suggests that herpesviruses use multiple strategies to manipulate important components of the host cell nuclear environment during infection. The study, conducted by researchers at the University of Toronto in collaboration with Affinium Pharmaceuticals Inc., provides novel insights into the potential functions of over 120 previously uncharacterized viral proteins.

Most people are infected with the three human herpesviruses that were the subject of this study; namely herpes simplex virus (type 1), Epstein-Barr virus, and cytomegalovirus. Herpesviruses have complex life cycles due to their adept manipulation of the host cell environment. Although often asymptomatic, herpesviruses can cause life-threatening diseases. In order to provide a more complete understanding of how these viruses alter host cells, the researchers developed a system to examine each viral protein individually in human cells.

The researchers investigated over 230 individual proteins from the three herpesviruses. They focused on 93 identified viral proteins that localized to the cell nucleus and altered key cellular components that regulate gene expression, cell growth and death, and antiviral responses.

Cells depend on nuclear structures called PML bodies to control cell proliferation and survival, to ensure damaged DNA is repaired, and to inhibit virus replication. 24 of the nuclear viral proteins, several of which had no previously assigned function, were found to disrupt or

reorganize PML bodies, suggesting that herpesviruses employ multiple strategies for manipulating this key regulator of essential cellular processes.

Further studies will be needed to determine how the identified viral proteins function in the context of viral infection, but this research provides a starting point for investigating how these proteins affect important processes of the cell nucleus.

Source: Public Library of Science