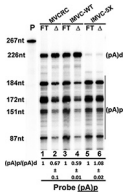
AMERICAN SOCIETY FOR MICROBIOLOGY | Journal of Virology®

SPOTLIGHT

Articles of Significant Interest in This Issue

Cellular CPSF6 Regulates Minute Virus of Canines Alternative RNA Processing in Conjunction with Viral NP1

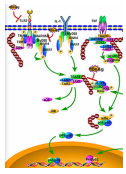
Minute virus of canines (MVC) is an autonomous parvovirus that infects dogs. It generates a single pre-mRNA species spanning the length of its 5-kb genome that is alternatively spliced and polyadenylated to generate at least 14 individual mRNAs. The viral protein NP1 is required for this process. Dong et al. (e01530-18) found that a cellular factor, CPSF6, in conjunction with NP1, regulates MVC RNA processing and thus its gene expression. This work provides new insights into how such a small genome generates so many mRNAs.



Cells that lack CPSF6 exhibit altered NP1-dependent MCV RNA processing.

Hepatitis B Virus Manipulates NF-κB Activity by Association of Its E Antigen with NF-κB Essential Modulator

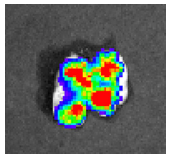
The role of hepatitis B virus (HBV) e antigen (HBeAg) in inflammatory responses is not fully understood. Wang et al. (e00667-18) found that HBeAg associates with the NF-κB essential modulator (NEMO) and inhibits tumor necrosis factor-associated factor 6 (TRAF6)-mediated K63-linked NEMO ubiquitylation. This interaction results in downregulation of NF-κB activity and the promotion of virus replication. These results shed light on HBV-related suppression of NF-κB signaling and HBV-induced pathogenesis of chronic hepatitis and suggest that different approaches be used to treat HBeAg-positive and HBeAg-negative infections.



Schematic illustration of events underlying HBeAg-regulated NF-κB activity.

Loss of β6 Integrin Decreases Influenza Disease Severity in Obese Mice

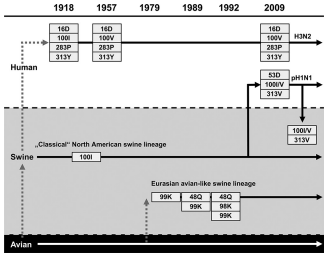
Obese individuals are at high risk for severe complications of influenza, including increased acute lung injury, increased viral spread, and decreased wound repair. Meliopoulos et al. (e01646-18) found that loss of a single epithelial integrin, β6, reduces disease severity by decreasing acute lung injury and viral spread. Obese mice lacking β6 have less disease, which is dependent on the type I interferon response. These findings increase understanding of influenza pathogenesis in high-risk populations and could lead to development of new therapies.



Viral spread in lungs infected with influenza bioluminescent reporter virus.

Pandemic Potential Assessment of Influenza A Viruses Currently Circulating in Swine

To successfully cross the species barrier and circulate in humans, avian influenza A viruses (IAV) must acquire mutations to escape the antiviral activity of MxA GTPase. Dornfeld et al. (e00997-18) found that the degree of resistance to MxA restriction is similar to that of pandemic IAV. The respective mutations are acquired gradually during circulation in the porcine host, allowing escape from the antiviral activity of swine Mx proteins. These data suggest that IAV of the Eurasian avian-like swine lineage possess increased zoonotic potential and should be carefully monitored.



Temporal appearance of MxA escape mutations.

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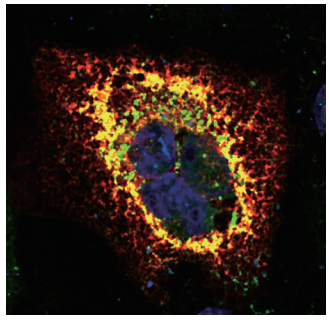
Association of HIV-1 Antisense Protein from Various Clades with Autophagy

HIV-1 antisense transcripts encode a protein known as antisense protein (ASP), which is associated with autophagy, potentially because of multimer formation. In this study, Liu et al. (e01757-18) analyzed ASP from various HIV-1 clades and found that, despite variation between clades in multimerization, all induce autophagy, albeit to varying extents. ASP associates with autophagy factor p62/SQSTM1, leading to modulation of ASP abundance. These findings reveal common, cross-clade properties of ASP, which suggests it as a potential target for antiretroviral therapies and vaccine design.



Colocalization of ASP with p62/SQSTM1.