

SPOTLIGHT

Articles of Significant Interest Selected from This Issue by the Editors

A Novel Virus Exhibits Genomic Features of both the *Papillomaviridae* and the *Polyomaviridae*

Papillomaviruses and polyomaviruses are distinct families of small, nonenveloped DNA viruses. Woolford et al. (p. 13280–13290) describe a novel virus, detected in papillomas and carcinomas from an endangered Australian bandicoot species, that exhibits genomic properties of both the *Papillomaviridae* and the *Polyomaviridae*. Viral properties include a large genome size (~7.3kb) and open reading frames (ORFs) that encode papillomavirus-like L1 and L2 structural proteins. The genomic organization is polyomavirus-like, and ORFs encoding large T and small t antigens are present. Discovery of this virus provides further insight into the evolution of these ancient viruses and has implications for their currently accepted taxonomic placement.

Arenaviruses Prefer Zinc

The arenavirus envelope glycoprotein complex contains a stable signal peptide (SSP) that adopts a bitopic membrane topology and interacts with the G2 fusion subunit to modulate pH-induced activation of membrane fusion. York and Nunberg (p. 13385–13391) report that an invariant array of six cysteine and histidine residues in the cytoplasmic domain of G2 is essential for SSP association. Three of these residues form a zinc-binding domain in G2, suggesting that the noncoordinated residues participate with an essential cysteine in SSP to form an intersubunit zinc-binding structure that positions the ectodomain loop of SSP for membrane fusion.

Identification of Mouse Cytomegalovirus-Encoded MicroRNAs

MicroRNAs (miRNAs) are small regulatory RNAs found in animals, plants, and some viruses. Buck et al. (p. 13761–13770) and Dölken et al. (p. 13771–13782) now identify miRNAs encoded by murine cytomegalovirus (MCMV). MCMV miRNAs are detected in lytically infected fibroblasts, where they accumulate to high levels in comparison to cellular miRNAs. Some MCMV miRNAs originate from complementary strands and show features of posttranscriptional regulation. MCMV miRNAs are also detected in macrophages and in infected animals, suggesting a role for these sequences in virus-host interactions.

Adhesion Interactions at the Human Immunodeficiency Virus Type 1 Virological Synapse

Human immunodeficiency virus type 1 (HIV-1) spreads between T cells across a supramolecular structure called the virological synapse (VS). VS formation is triggered by cell-cell contact between HIV-1-infected cells and susceptible target T cells and requires Env-receptor binding. Jolly et al. (p. 13916–13921) now show that integrin-ICAM interactions have an important function in cell-cell spread of HIV-1 by contributing to VS formation and function. In the absence of integrin leukocyte function-associated antigen 1, HIV-1 cell-cell spread is significantly impaired, suggesting that adhesion molecules are required for HIV-1 dissemination in infected hosts.

Basal Expression of Interferon Pathway Components Determines Cardiac Cell Response

The cardiac interferon (IFN) response is a determinant of protection against viral myocarditis, which affects more than 5% of the human population. Zurney et al. (p. 13668–13680) show that a high level of basal IFN- β expression in cardiac myocytes prearms this vulnerable, nonreplenishable cell type. In contrast, a high level of basal expression of components responsive to IFN- β in adjacent cardiac fibroblasts renders these cells highly IFN sensitive, thus limiting their capacity to serve as reservoirs for viral replication. This study provides the first indication of an integrated network of cell type-specific innate immune components for organ protection.