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SPOTLIGHT

Articles of Significant Interest Selected from This Issue by the Editors

Induction of the Gαq Signaling Cascade Is Required for Human Immunodeficiency Virus Type 1 Entry

Binding of the human immunodeficiency virus type 1 (HIV-1) envelope glycoprotein to its primary receptor, CD4, and one of two coreceptors (CCR5 or CXCR4) activates a signaling cascade resulting in Rac-1 activation of actin cytoskeletal reorganizations essential for HIV-1-induced membrane fusion and entry. Harmon and Ratner (p. 9191–9205) used small-molecule inhibitors and RNA interference to identify components of this cascade, including Gαq, phospholipase C, intracellular calcium release, protein kinase C, Pyk2, and Ras. These results illuminate new therapeutic targets focusing on host signaling mediators, a strategy less likely to result in antiviral resistance.

Human Cytomegalovirus Infection Alters Expression of Cellular MicroRNA Species That Affect Its Replication

Human cytomegalovirus (HCMV) regulates many cellular processes via a variety of mechanisms. Wang et al. (p. 9065–9074) found that HCMV infection alters expression of some cellular microRNAs (miRNAs), including those that influence viral replication. The vast diversity of HCMV-induced miRNA targets suggests that miRNAs are involved in regulating many aspects of HCMV replication. Viral interactions with cellular miRNA regulatory pathways offer new insights into virus-host interactions and suggest new approaches for diagnosis and control of viral diseases.

Epigenetic Defense against Geminiviruses

Eukaryotic cells use cytosine methylation as a means of silencing transposable elements and maintaining genome stability. Raja et al. (p. 8997–9007) show that plants use similar mechanisms to inhibit the replication of DNA-containing geminiviruses. Methylation-deficient mutant plants are hypersensitive to infection, and the small RNA-directed methylation pathway is required for host recovery. This work furthers our understanding of innate immunity in plants by identifying viral chromatin methylation as a novel and potent defense against DNA viruses.

Differential Antigen Presentation Kinetics

It is not known whether all $CD8^+$ T-cell epitopes from the same protein are presented with similar kinetics. Sacha et al. (p. 9293–9298) show that two $CD8^+$ T-cell epitopes derived from the same viral protein are presented with different kinetics. The results suggest that significant differences exist among $CD8^+$ T cells directed at the same viral protein. Additionally, caution must be applied when extending the characteristics of individual epitope-specific $CD8^+$ T-cell responses to all $CD8^+$ T-cell responses directed against the same viral protein.

Novel Astroviruses in Insectivorous Bats

Astroviruses cause diarrhea in humans and a variety of animals. Chu et al. (p. 9107–9114) report the discovery of novel astroviruses in different bat species. The prevalence of viruses in *Miniopetrus* bats roosting at a single habitat ranged from 36% to 100% in a single year, and the genetic diversity of astroviruses at this single habitat was greater than that observed in human astroviruses worldwide. Some bat astroviruses are phylogenetically related to other mammalian astroviruses, suggesting a possible common viral ancestor. Thus, bats are important reservoirs of astroviruses with high genetic diversity, emphasizing their potential for generating viruses posing zoonotic threats.