IN VIVO ANALYSIS OF HIV REPLICATION AND PATHOGENESIS

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HIV is the causative agent of AIDS. Currently, the AIDS epidemic expands to all corners of the world and there are approximately 35,000,000 infected individuals. HIV is mostly transmitted after mucosal exposure and women represent the fastest group of newly infected individuals. Despite the increased availability of antiretroviral therapy, there have not been any declines in the rates of new infections. In fact, revised estimates for 2006 have increased the number of new HIV infections in the US to 56,300. Currently, the prospects of a preventative vaccine are somewhat encouraging, but an effective vaccine is many years in the future. One of the most significant issues preventing the advancement of the field is the fact that HIV's tropism is limited to humans and chimpanzees. Therefore, *in vivo* analysis of HIV is severely restricted. The recent development of humanized mice reconstituted with human hematopoietic stem cells represents a significant advance that permits the *in vivo* analysis of HIV. Humanized mice can be infected by HIV in the same manner as humans and HIV infection results in a sequel that mimics to a significant extent what is normally seen in infected patients. We have taken advantage of humanized mice to study HIV replication, pathogenesis, and transmission and to develop novel approaches to prevent mucosal HIV infection.