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Effect of Recombination in the Evolutionary Dynamics of HIV under the Surveillance of Immune System WEIQUN PENG, WENJING YANG, GUANYU WANG, The George Washington University — Human immunodeficiency virus (HIV) is a retrovirus that causes acquired immunodeficiency syndrome (AIDS), which has become one of the most destructive pandemics in history. The fact that HIV virus evolves very fast plays a central role in AIDS immunopathogenesis and the difficulty we face in finding a cure or a vaccine for AIDS. A distinguishing feature of HIV is its high frequency of recombination. The effect of recombination in the HIV evolution is not clear. We establish a mathematical model of the evolutionary dynamics. This model incorporates both point mutation and recombination for genetic diversity, and employs a fitness function developed by Wang and Deem (PRL 97, 188106, 2006) that accounts for the effect of immune system. Using this model, we explore the role of recombination in the battle between the virus population and the immune system, with a special focus on the condition under which recombination helps the virus population to escape from the immune system.

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