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LENTIVIRAL-BASED VECTORS: DEVELOPMENT AND BIOTECHNOLOGICAL APPLICATIONS

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Viral vectors have gained their popularity in basic research and gene therapy applications because of their high rates of gene transfer that are far superior to those achieved with non-viral methods. Numerous types of virus-derived gene transfer systems are available these days. Among them, lentiviral vectors have emerged as potent and versatile tools for gene transfer into a whole range of different cell types as they are capable of infecting a wide variety of dividing and nondividing cells, integrate stably into the host genome, and result in long term expression of the transgene. The use of lentiviral vectors has been made possible by the constantly expanding advances in basic virology gained from the decades-lasting research and by a series of modifications that have increased their safety. Their use ranges from basic to applied research, from in vitro to in vivo approaches, from overexpression to knockdown, and from embryonic stem cells to transgenic animals. Progress in the development of lentiviral vector systems and their applications will be discussed.

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