

'Lentiviral transgenesis: lots of promises with few limitations'

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Lentiviruses are a class of retroviruses that can be used as vectors to deliver genes either for gene therapy or to derive transgenic animals. It includes immunodeficiency viruses, HIV, FIV, BIV and anemia viruses AIEV. They are particularly attractive as they can infect dividing as well as non-dividing cells, have a relatively good cloning capacity of around 10 kb, have the ability to integrate into the host cell-genome, can be self-inactivating and pseudo-typed, in order to infect a broad range of cells. Other modifications can be engineered to enhance expression of the incorporated gene.

The ability of lentivectors to very efficiently produce transgenic animals was first demonstrated in rodents, back in 2002. Since then, the successful generation of transgenic pigs, cattle sheep and even birds has been reported with a similar high overall efficiency.

We will summarize these results and highlight the potential of these vectors, in conjunction with RNA interference, to be used as an attractive alternative approach to down-regulate gene expression in farm animals. Potential applications include the increase of some zootechnical performances and of animal resistance to infectious diseases but also analysis of the function of a gene or of one of its allelic form in a specific cell type.