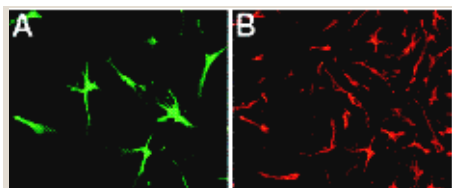


Challenge

Retroviral vectors can provide stable gene transfer and expression in mammalian cells and are commonly used for basic research. Although safety aspects are not yet fully solved, these vector types are continuously developed for gene therapy applications. Packaging cell lines have been developed, which safely produce replication-incompetent vectors. A major factor that determines the host ranges of such vectors is the retroviral glycoprotein in the outer lipid envelope of the vector particle. Because of the instability of the retroviral envelope, the particles cannot be efficiently concentrated to higher titers by ultracentrifugation, limiting the application of retroviral vectors. In addition, the host range of retroviral vectors is restricted by expression of the cognate cellular receptor, leading to inefficient



LCMV pseudotyped vectors transduce primary human glioma cells: Three days after transduction, the cells were analyzed by immunostaining with monoclonal anti-eGFP antibody (A) and polyclonal anti GFAP antibody (glioma cell marker)

transduction in some cell types. Therefore, new packaging cell lines with improved properties regarding vector titers, stability, host range, and cell toxicity are needed.

Technology

The inventors were able to show that the exchange of the parental ecotropic glycoprotein to glycoprotein of lymphocytic choriomeningitis virus (LCMV) is an attractive alternative to currently used envelope proteins for pseudotyping oncoretroviral and lentiviral vectors. Packaging cell lines were established that allow to achieve high vector titers due to decreased cell toxicity and increased stability of the envelope protein. In addition, the inventors were able to show that LCMV pseudotyped retroviral vectors efficiently transduced different human cell types (e.g. glioma cells, lymphocytic cells).

Commercial Opportunity

This vector technology can be used as an efficient tool in basic research and might improve clinical applications of retroviral vectors once general safety concerns are resolved. The technology is offered for licensing.

Patent Situation

A priority claiming German Patent was filed in 1998 (DE 19856463). Issued European Patent (EP1006196 B1, valid in GB, IT, FR, DE, SE). Two US Patents are issued (US6440730) and (US6589763).

Further Reading

W. R. Beyer et al. 2002. 'Oncoretrovirus and Lentivirus Vectors Pseudotyped with Lymphocytic Choriomeningitis Virus Glycoprotein: Generation, Concentration, and Broad Host Range'. *Journal of Virology*, 76: 1488-1495

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