

# HIV Gene Delivery System

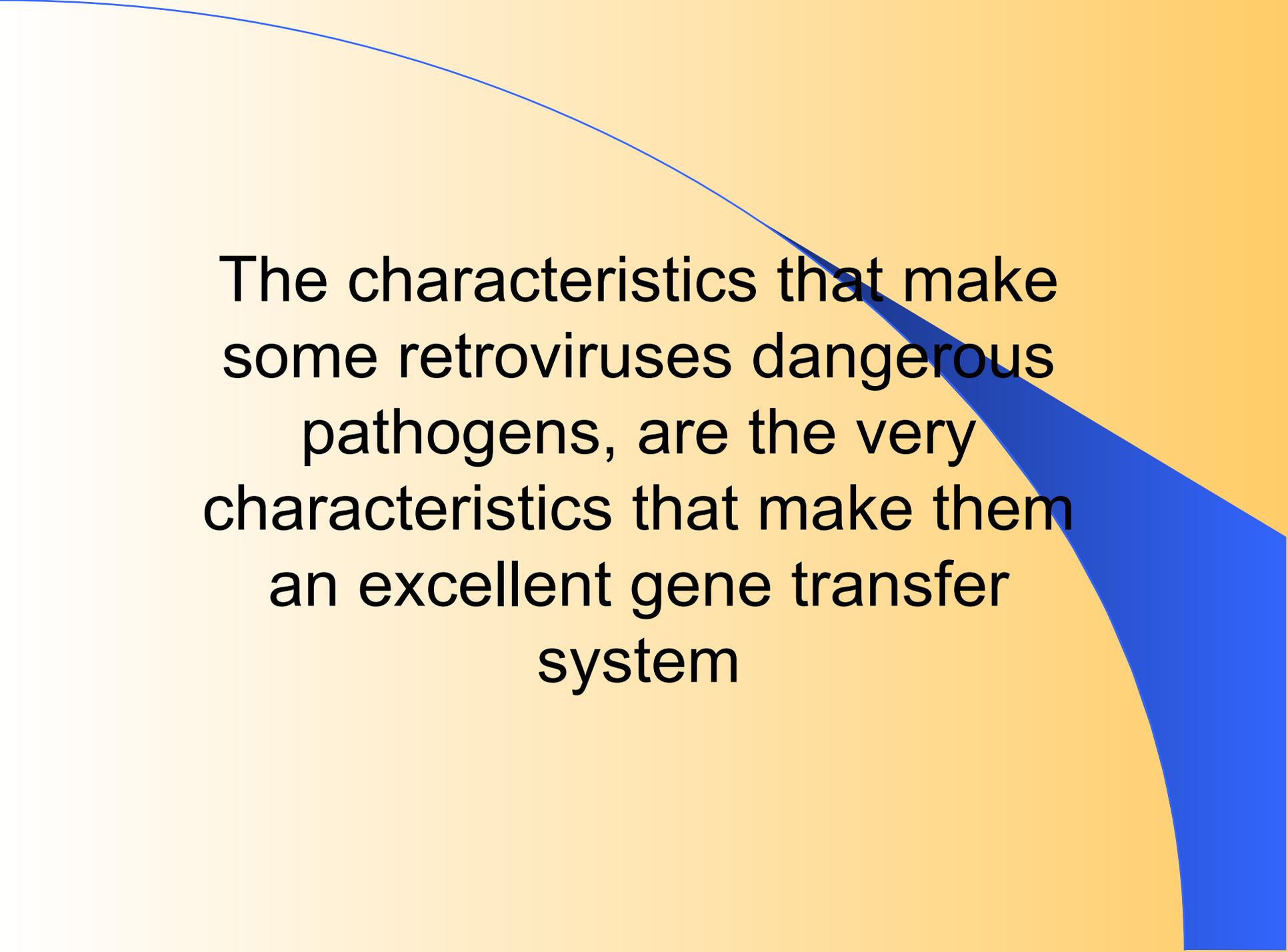
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The characteristics that make some retroviruses dangerous pathogens, are the very characteristics that make them an excellent gene transfer system

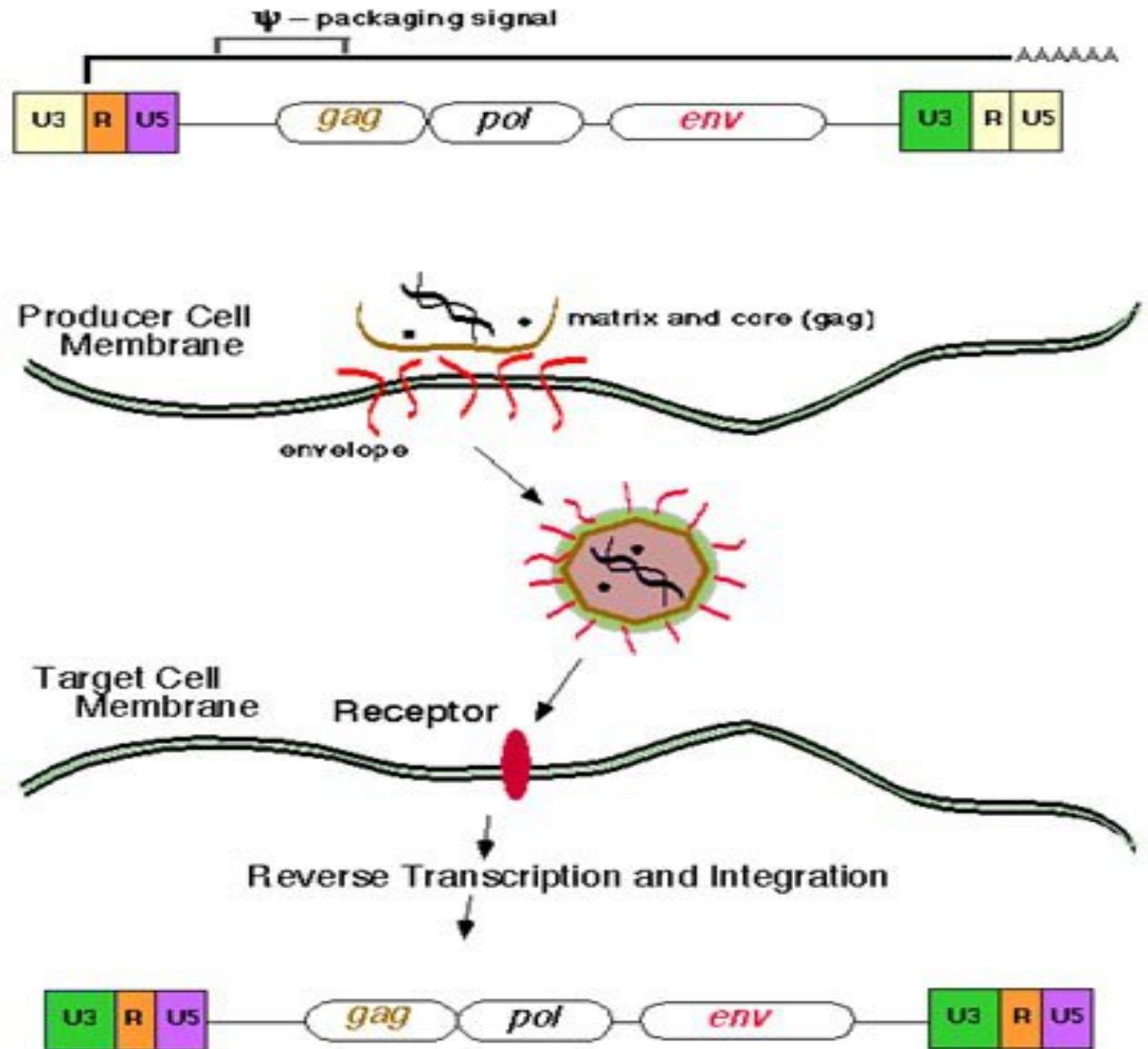
# Retrovirus Characteristics

Retroviruses exist as proviruses in the hosts genome

Retroviruses have powerful promoters

Retroviral genomes can accommodate changes to its configuration

**Retroviruses  
are the only  
animal  
viruses that  
integrate into  
the hosts  
genome**



The virus that causes aids  
may one day be used in gene  
therapy

**WHY?**

Because it is an lentivirus

# What is a Lentivirus?

Lentiviruses are a subfamily of retroviruses – HIV is a lentivirus

# Why is a lentivirus necessary?

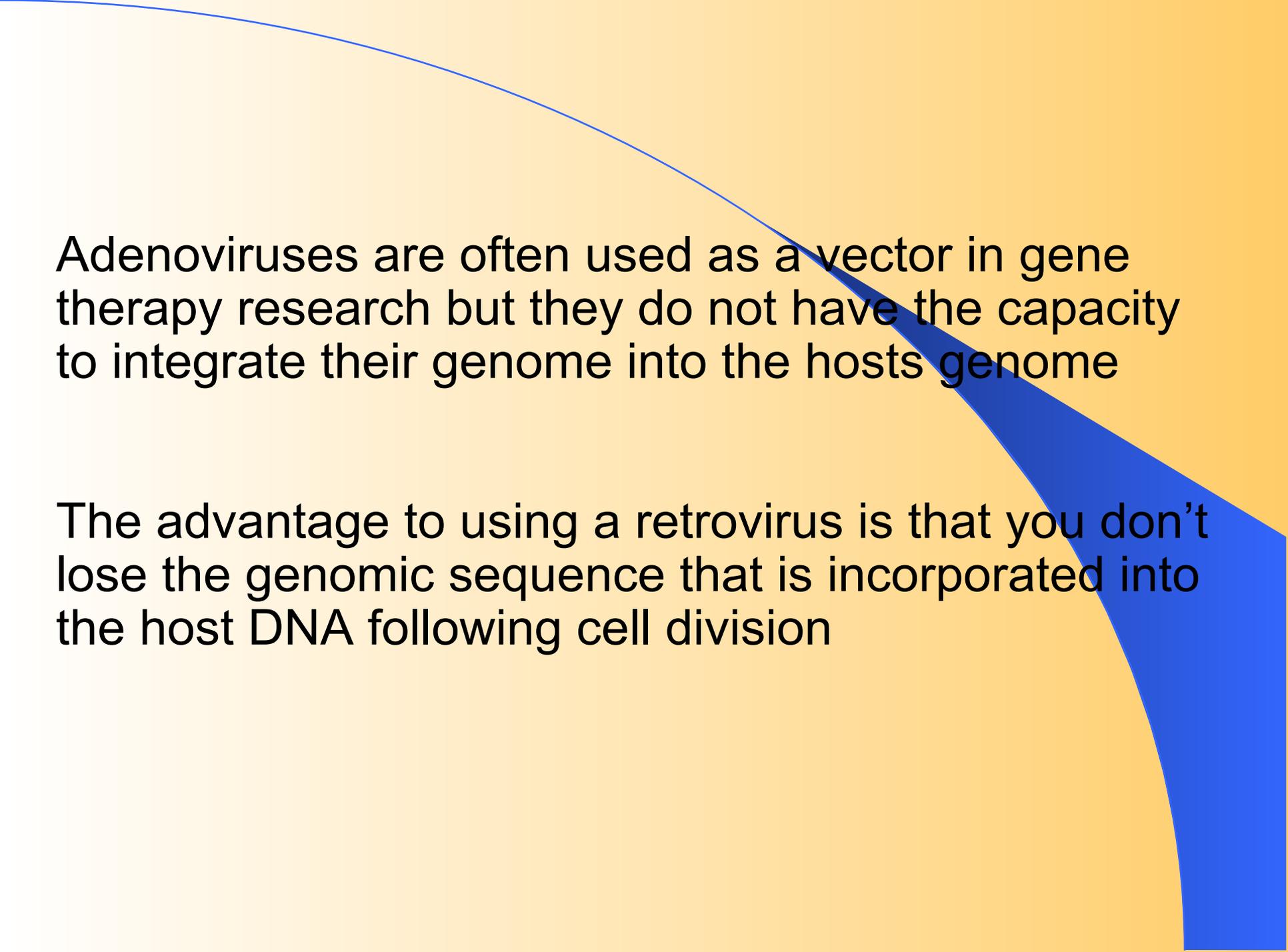
Lentiviruses can introduce a gene of interest into cells that do not divide – simple retroviruses cannot

This ability makes them ideal for a delivery system because most of our cells, like hemopoietic stem cells, do not divide

# Why use HIV?

A genetically stripped down amalgam of HIV components can be fashioned with a molecular switch system that turns them off in response to a common antibiotic

This type of control allows doctors to control gene expression in people who are treated with gene therapy - If something goes wrong, the expression can be turned off



Adenoviruses are often used as a vector in gene therapy research but they do not have the capacity to integrate their genome into the hosts genome

The advantage to using a retrovirus is that you don't lose the genomic sequence that is incorporated into the host DNA following cell division

# Summary

- **Definitions**
- **rDNA Objectives**
- **Steps in rDNA Processing**
- **Genetic Engineering Advances**
- **The use of rDNA to Produce Human Insulin**
- **Cloning Vectors**
  - **Plasmids**
  - **Phage**
  - **BACs and YACs**
- **HIV Gene Delivery System**
- **Summary**