

Viral Vector Core Facility

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Recombinant Viral Vectors

We can remove pathogenic features from the genomes of viruses and replace them with genes of our interest, while retaining their ability to infect and transport genes into target cells. Such engineered viral vectors are excellent gene delivery vehicles for *ex vivo* and *in vivo* applications. Viral vectors facilitate the delivery of foreign genes into target cells within intact organs, allowing precise manipulation of cellular functions or therapeutic intervention. Some vectors can integrate their genetic cargo into the host genome, enabling sustained gene expression, which is advantageous when persistent transgene expression is required for therapeutic benefit.

Viral vectors as gene delivery vehicles

to introduce genes of interest for various functional studies

Anatomical mapping- GFP, mCherry,...
Optogenetic channels- ChR, HaloR,...
Pharmacogenetic receptors- DREADD, PSAM
Optogenetic imaging- GCaMP, CaMPARI

to manipulate expression of a gene of interest in cells grown in a petriplate or in intact organs, using **RNA interference and CRISPR/Cas technology**

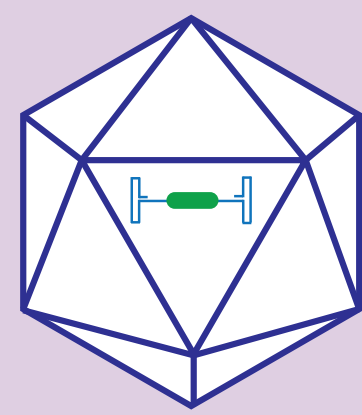
in combination with transgenics, **specific cell-types** can be addressed

conditional and temporal expression of a transgene is possible

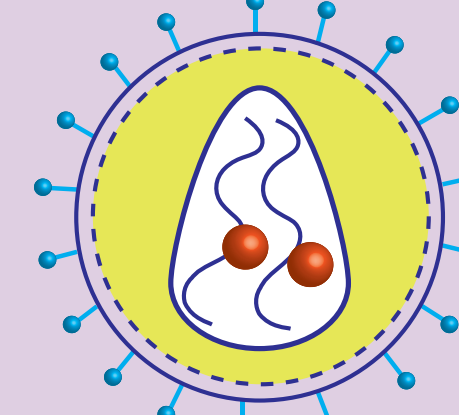
can attain cell-type specific gene expression by creating novel viral vectors, using **cell-type specific gene regulatory elements**

recently, viral vectors are used as delivery vehicles for **gene-therapy and vaccines**

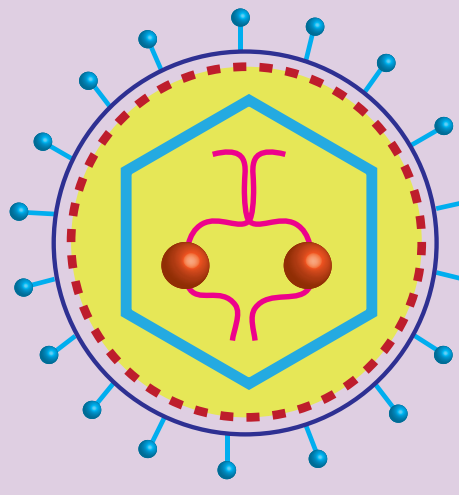
Types Of Viral Vectors In Our Toolkit



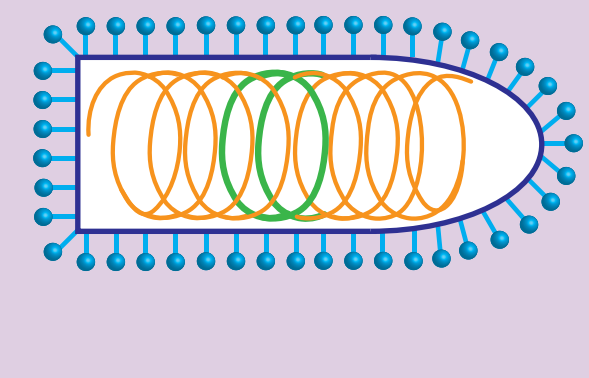
Adeno-associated virus: Replication defective, non-pathogenic vector popular tool in research and in clinics



Lenti virus: For stable, long-term gene expression, stable integration into host cell's genome

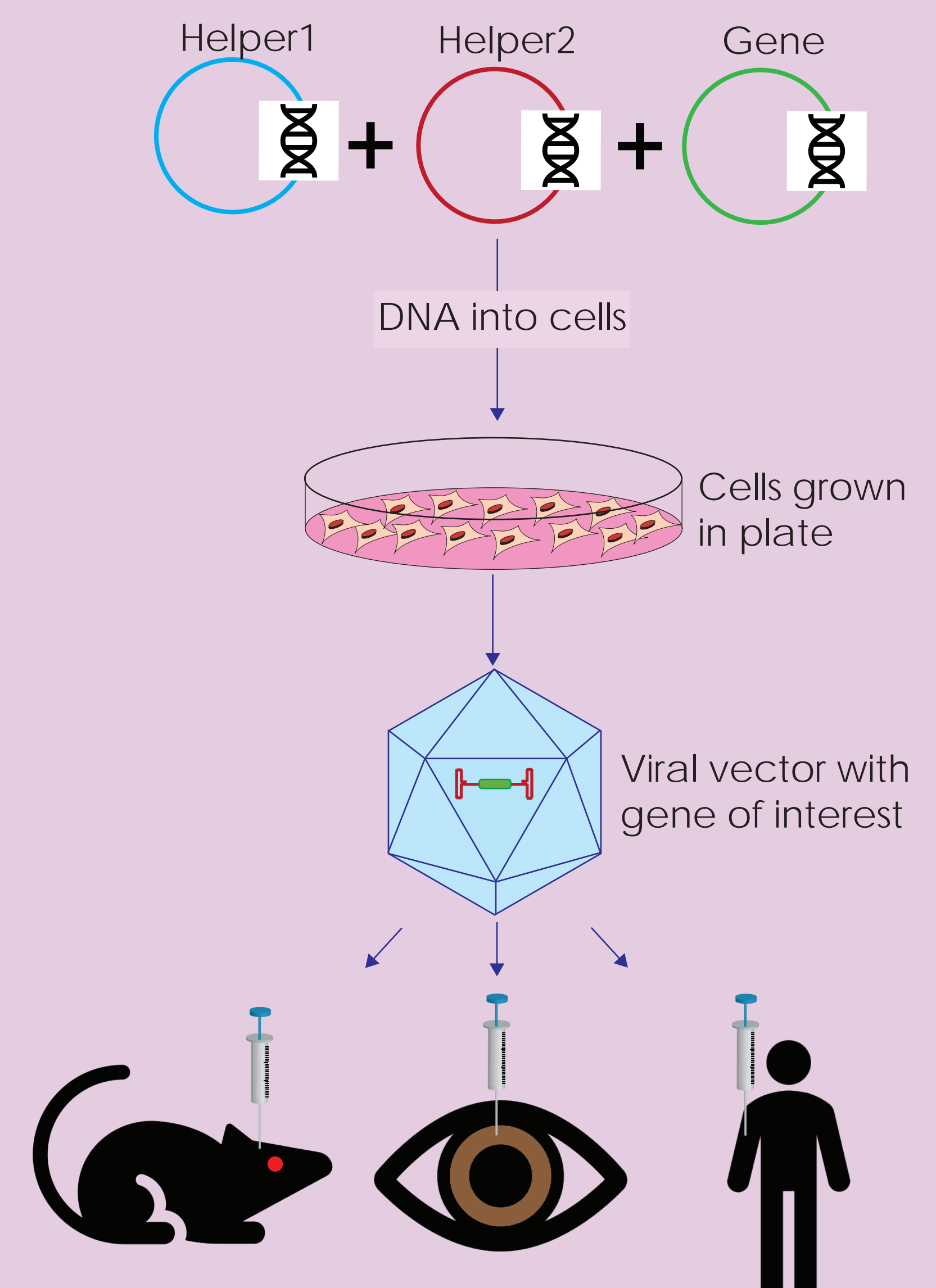


Moloney murine leukemia virus: For stable, long-term gene expression, stable integration into host cell's genome, used to target dividing cells



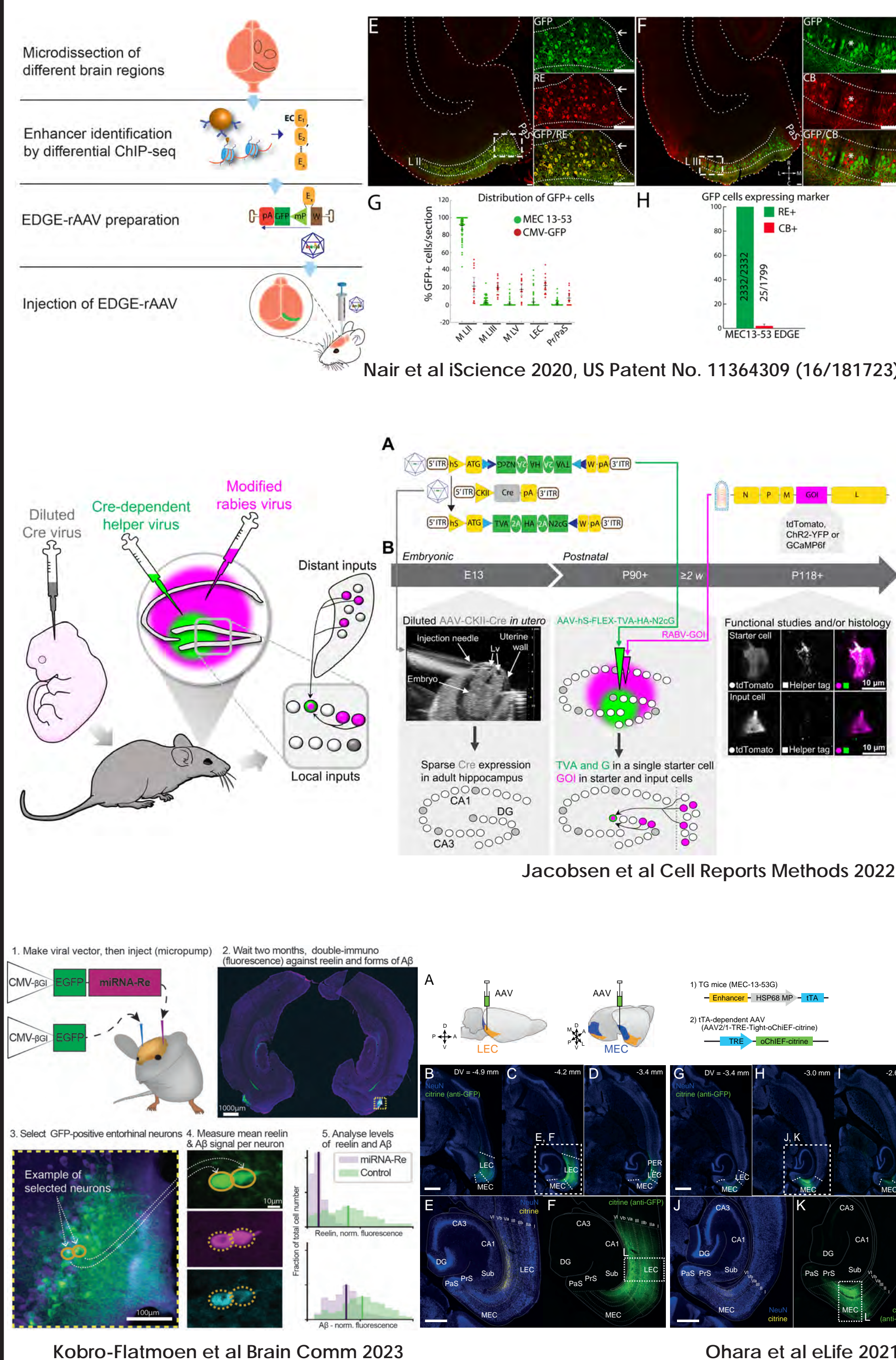
Rabies virus: Pseudotyped, G protein-deleted virus, complemented with G, used for transsynaptic input tracing

Preparation of Viral Vectors



Viral vectors carrying transgenes are used in various research and therapeutical applications

Viral Vector Applications: Unlocking Possibilities



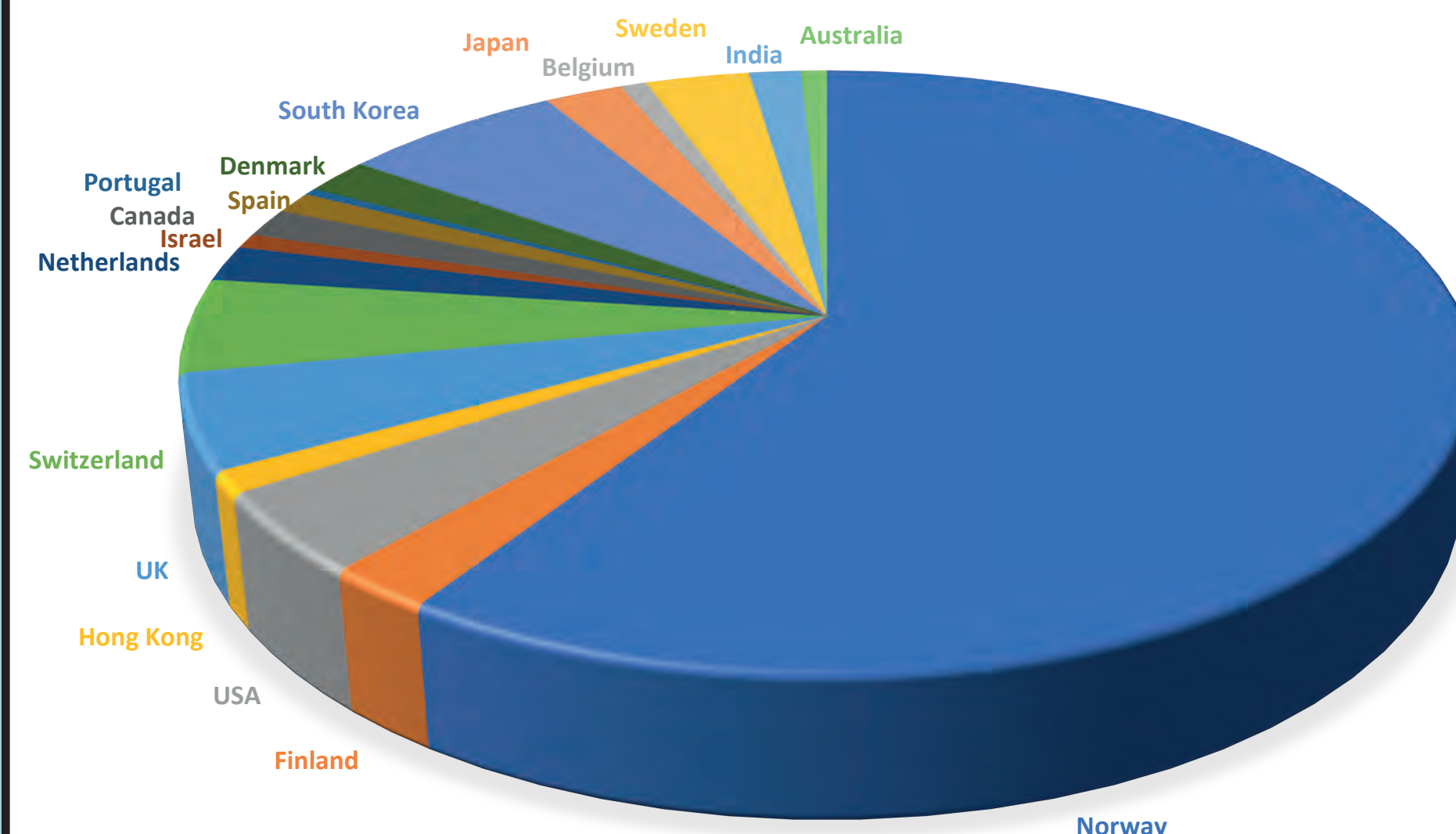
Viral Viral Core: Our Progress Thus Far

Unique expertise in designing and preparing various high-quality research-grade viral vectors

VVC developed a range of vectors for 70 national and international research labs

Several collaborative endeavors have yielded numerous efficient novel vectors and publications

Developed numerous innovative viral vector strategies for life science research



Provided viral vectors to multiple research laboratories across different countries

Viral Viral Core: Our Service Spectrum

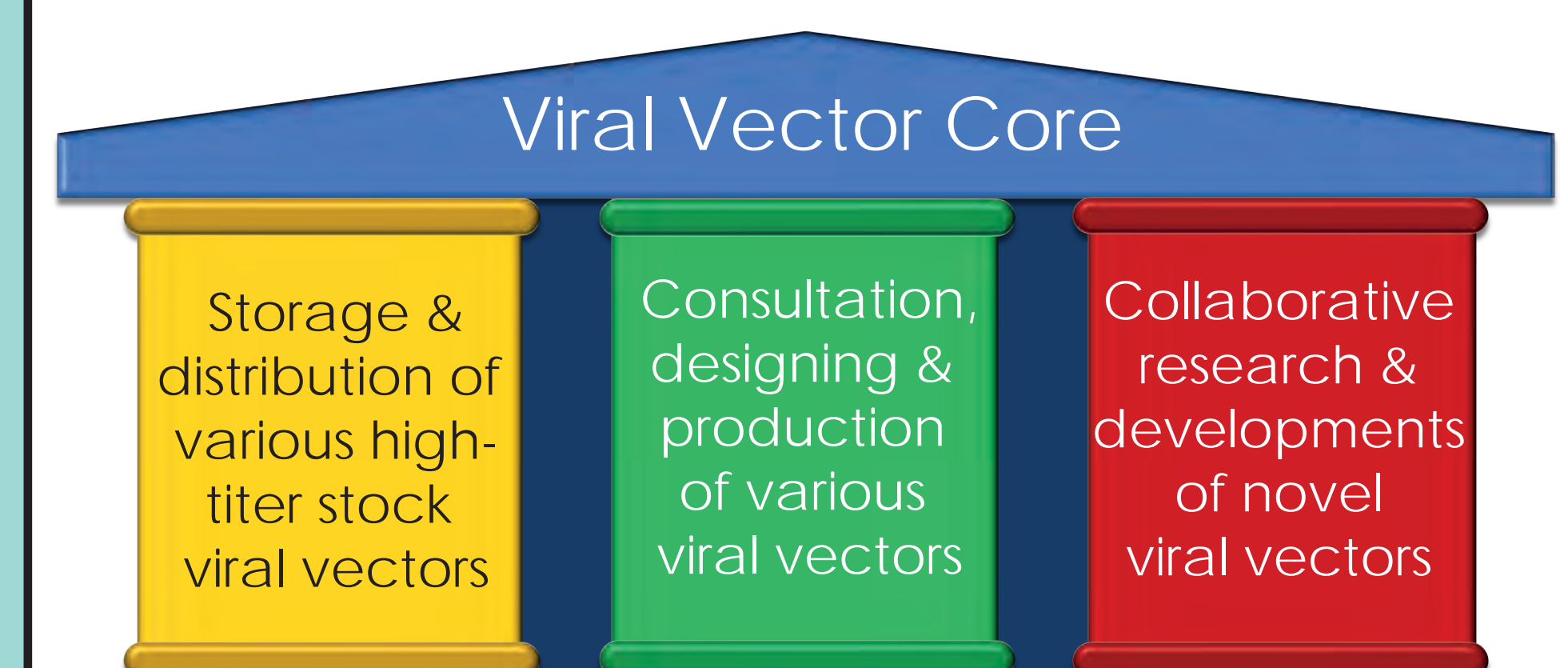
Custom viral vector productions

Consultations and designing of novel viral vectors

Maintenance and distribution of ready-to-inject high-titer stock viruses

Research and Development of novel viral tools

Open for collaborative projects for building next-gen tools



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