BIOANALYSIS SPOTLIGHT

Vector Shedding Analysis for Clinical Assessment of Viral Vector Gene Therapies and Safety Risk in Preclinical Development

VECTOR SHEDDING

Safety Evaluation of Viral Vector Replication in Patients Post-administration

Vector shedding represents an important safety risk in the clinical administration of viral vector-based gene therapies. Viral vectors used for *in vivo* gene delivery, primarily adeno-associated viral (AAV) and adenoviral (AdV) vectors, are shed from the patient via biofluids following administration and persistent levels can indicate unwanted replication of the vector is occurring. To understand this potential safety issue, levels of vector in patient biofluids are monitored during clinical development, and typically, also are investigated during preclinical development to provide early indication of replication potential.

- Vector shedding (*Figure 1*) is used to evaluate clinical safety of *in vivo* viral vectors, like adeno-associated viral (AAV). Studies are conducted over months to demonstrate the diminution of vector to below detectable levels.
- Biofluids from patients (*Table 1*) are analyzed using PCR based methodologies, and clinical shedding studies are conducted under GCP.
- Vector shedding analysis is typically requested by regulators at the preclinical stage and performed under GLP using selected biofluids to evaluate the potential for vector replication.
- Our team is experienced in transferring or designing specific PCR based assays to detect viral vector products to obtain high-quality data sets.
- ProtaGene has new state-of-the-art facilities, including automation, and our senior leadership collaborates with clients in the design and transfer of studies from inception through validation.

Figure 1. Life cycle of AAV gene therapy from dosing through vector shedding

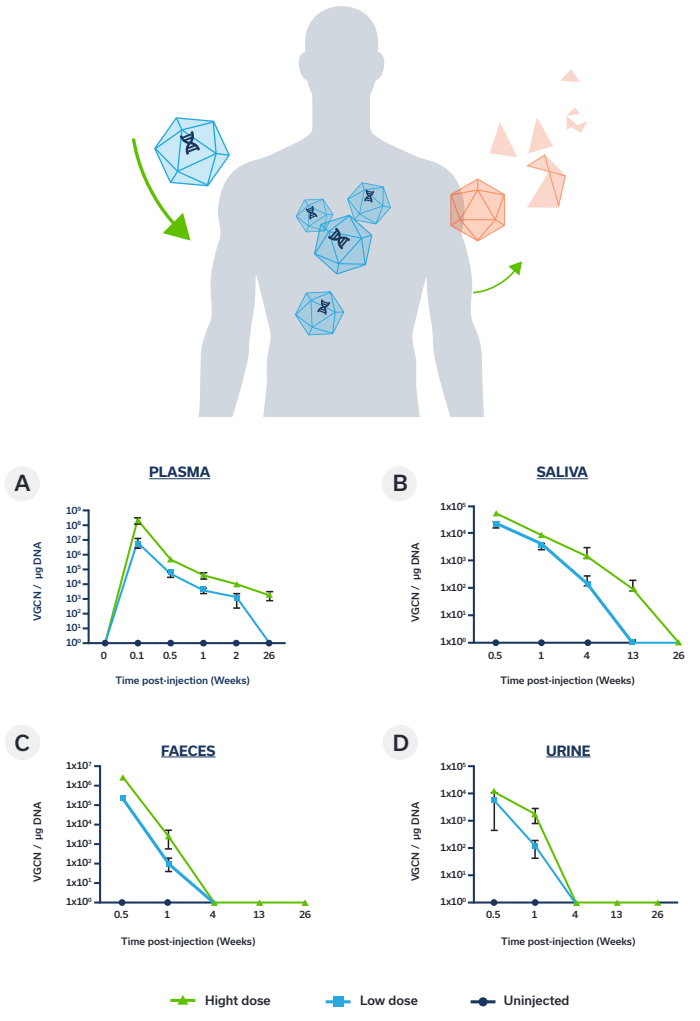

Table 1. Key biofluids commonly analyzed for vector shedding

Biofluids	
Blood	Urine
Tears	Feces
Saliva	Semen

ProtaGene
Analytical Excellence

North America
4 Burlington Woods Drive
Burlington, MA 01803 USA

Europe
Inselwiesenstraße 10
74076 Heilbronn Germany

ProtaGene.com
info@protagene.com

Advantages of ProtaGene

- Studies designed to enable preclinical assessment of safety risk and monitoring of gene therapies in the clinic.
- ProtaGene has state-of-the-art instrumentation and automation to support vector shedding studies.
- Dedicated workflows to enable high throughput analysis of blood and biofluids.
- Established processes to maintain the integrity of results generated during sample analysis while minimizing the risk of contamination.
- Bioanalytical lab designed and managed by a leading industry expert with 25+ years in the field.
- Expert understanding of industry expectations for how molecular assays should be developed and validated.

With a deep understanding of this complex field and commitment to innovation, we're uniquely positioned to help innovators overcome challenges and bring life-changing therapies to patients.

-Paul Byrne

Meet ProtaGene's Senior Director of Genomics

Paul Byrne has 25 years of industry experience and can frequently be found speaking at symposia on topics such as: analytical development challenges for ATMPs, biodistribution and safety assessment considerations for cell and gene therapies and more. Paul received his BSc (Hons) in biology from the University of Stirling (UK) and his MSc in research from the University of Glasgow (UK).

ProtaGene
Analytical Excellence

North America
4 Burlington Woods Drive
Burlington, MA 01803 USA

Europe
Inselwiesenstraße 10
74076 Heilbronn Germany

ProtaGene.com
info@protagene.com

v.062023