VECTOR GENE TECHNOLOGY COMPANY LTD.

About VGTC

Vectors

- *Adenovirus（AdV）*
- *Adeno-associated virus（AAV）*
- *Plasmid DNA vectors*

Services

- *Research grade gene vector packaging*
- *Production of research grade gene vectors*
- *Pilot scale production and quality test for clinical grade gene therapy products*
- *Pre-clinical laboratory data / services for investigational new drugs (IND) in gene therapy.*
- *Preparation of materials for the application of IND in gene therapy in China*

Vector Gene Technology Company Limited (VGTC), established in Oct. 2000, is an expert in gene vector technologies, primarily engaged in the research and development of gene transfer technologies and gene therapeutics.

Our mission is to accelerate gene-based drug development by supporting researchers worldwide both in academic and biopharmaceutical sectors. VGTC has established a series of competitive systems for the production and purification of high quality, clinical grade, adenovirus (AdV), adeno-associated virus (AAV) and plasmid DNA vectors.

In VGTC, our facilities and equipments are qualified for clinical-grade pharmaceutical products. VGTC provides services including 1) gene vector production and purification for biomedical researchers, 2) novel viral vector development as customer required, 3) comprehensive QA/QC services with documentations and a full manufacturing report to meet the requirements from China State Food and Drug Administration（SFDA）for the application of clinical trials for pharmaceutical products.

The high quality viral vector products, adenovirus or AAV products, are qualified for both *in vitro* and *in vivo* applications. Customers can obtain these quality guaranteed vectors timely and use them on gene function or pre-clinical studies. VGTC also provides several different type vectors containing bioresearch laboratory

commonly used foreign genes to meet your needs. VGTC has 400 m^2 GMP manufacturing facility, 5 and 80 liter-bioreactors and modular cell culture roller apparatus, which can hold 1,500 rolling bottles simultaneously. Our experienced staff and comprehensive QA/QC documentation play a very active role in GMP compliance. Our production and quality test services for clinical-grade gene therapy products provide abundance samples for investigational new drug (IND) applications and for phase I clinical trials. We are also experienced on the pre-clinical research work for gene therapy and the IND application for gene therapy. Full range services are guarantied to meet the requirements from SFDA, ranging from drug quality control, pharmacology, toxicology and clinical trail design from dossier preparation to drug application. Our comprehensive services can make your IND application process faster and smoother.

In VGTC, we provide customized services to meet different requirements. Production and quality control programs are designed for each client by experienced staff. We welcome comments and suggestions on our products and services to meet your special needs. Our high-quality products and passionate services would help you to meet your goal faster and easier.

Today, VGTC continues its mission to develop novel viral vectors to satisfy the need of the development of gene therapies and vaccines.

Adenoviral Vector Packaging Services

Adenoviral vector can be effectively inoculated into a broad range of post-mitotic cells including cells from highly differentiated tissues, such as skeletal muscle cells, pneumonic cells, neural cells and cardiac cells. It is the most commonly used viral vector in biomedical research and human clinical studies. Ad vector can be used to carry therapeutic drugs or vaccines. The 36 kb adenovirus genome with double strand DNA can allow the insertion of large gene of interest. The deletion of E1 region, replication-deficient recombinant adenovirus does not replicate in normal cells which is incapable of E1 complementation.

Adenovirus transfers therapeutic genes by transmitting its genome into the nucleolus of host cells and replicates itself in high efficiency.

VGTC provides services on cell culture from flask, rolling bottle to fermentation pot and choices of purification techniques of ultrafiltration or ion exchange chromatography. We also developed a series of reliable methods for quality control and product examination. VGTC provides quality services and high purity and high titer adenoviral vectors to meet the needs from customers in areas of mechanism research, pre-clinical research and clinical trials of IND.

Our service includes vector plasmid construction, recombinant viral DNA construction, recombinant DNA amplification, purification, examination and packing of the final products.

In VGTC, we provide rapid services and high quality adenoviral vectors for scientists working in the field of gene therapy that the functional genes mediated by adenoviral vectors. Clients can receive 10^{13}~10^{16} VP vectors within 1~3 months. The vector can be used in mechanism study and pre-clinical research of INDs. We also

provide pre-manufacture grade adenoviral vector products carrying the genes of your interest with competitive time and price. All of our products are manufactured under GMP condition which fulfills the quality requirements from China SFDA.

Clinical grade products and quality examination of adenoviral INDs are quality guarantied on clinical trial applications. Based on many years of experiences on pre-clinical research and the application processes of clinical trials in China, we provide high quality services to save your time and money on R&D of gene therapy INDs in China. The service includes quality research, pharmacological research, toxicological research and clinical trial application.

Adeno-associated Viral Vector Packaging Services

Adeno-associated virus (AAV) has received more attention in recent years as a friendly used vector for gene therapy. Adeno-associated virus is capable of infecting cells with many different type of tissues and expresses functional genes steadily in a relatively longer period. The vector is not pathogenic and has low immunogenic. It is currently accepted as the most encouraged viral vector among all viral vectors for gene therapy. Adeno-associated viral vector can carry therapeutic genes, negative sense nuclear acids, ribozymes or interfering RNAs (iRNA) and be applied in a broad field.

Recently, a number of AAV serotype vectors, including AAV1 to AAV8, are available. The variation among these vectors is the different chimeric AAV capsids that displays different serotype-specific properties, hence their infection efficiencies in variety of tissues and cells. AAV2 is the most widely used AAV serotype. It can infect most cell types with high efficiency, such as skeletal muscle cells, retina cells, hepatocytes, cardiac cells, neural cells, pancreatic cells, arthral synovium.

A novel serotype AAV vector, rAAV2/1, which contains ITR from AAV2 and capsid from AAV1, was developed in VGTC. The infection efficiency is much higher in tissues such as skeletal muscle, hepatocytes and other non-neural tissues. Especially in skeletal muscle of immuno deficient mouse, the infection efficiency is 100-1000 times higher than AAV2.

VGTC is one of the leading teams in the world on manufacture of high quality AAV products due to our unique process on AAV production and purification.

The utility of two-component production system using herpes simplex virus (HSV1-RC) to infect relevant cell lines is simulating the life cycle of wild-type AAV (wtAAV). The advantage of using this system is capable of recovering large quantity and high purity AAV products. By using this production system, we have produced AAV products which are satisfied by gene therapy researches world wide.

VGTC provides high quality service for rAAV2 and rAAV2/1 to our clients. The service covers the range from mechanism research, pre-clinical research to clinical trials of IND applications and manufacture with high purity and high titer AAV products.

Research scale manufacture of AAV vector offers high quality and rapid services to scientists working on gene therapy that the target genes mediated by AAV. Clients can receive 10^{12}~10^{15}vg vectors within 1~2 months. The vector can be used in mechanism research and pre-clinical research of INDs. We also provide pre-manufacture **research scaled AAV vector products** carrying commonly used genes. Our products are not only competitive on quality, but also on time and price. The products manufactured under GMP condition are guaranteed to achieve the quality requirements of China SFDA. **Manufacturing of clinical scale AAV and quality examination of AAV INDs** are specifically for clinical trial applications and for clinical trials. Based on many years of experiences on pre-clinical research and clinical trial applications of IND in China, we provide **pre-clinical research and clinical trial application services** for clients working with gene therapy INDs. The services can be packaged as quality research, pharmacological research, toxicological research and clinical trial application or choices of single service. Our services can help clients to get across the process of IND development in China smoothly.

Plasmid DNA Services

Plasmid vector is the core vector besides viral vectors. In recent years, research and application of DNA vaccine and gene therapy have rapidly progressed. DNA vaccine and gene therapy are not only require high quality, but also high quantity of plasmid DNAs. This demand can hardly be met from research laboratories. VGTC has the GMP conditioned manufacturing facilities, therefore can offer both research grade and clinical grade plasmid DNAs. Our plasmid DNA products are suitable for various applications including gene function, pre-clinical research, early clinical trials in gene therapy and vaccines. A full range of services is offered.

Products specifications for plasmid DNA：

Homogenicity >90% ccc (covalently closed circle)

Endotoxin <10EU/mg

Host RNA <0.2ug/mg

Host DNA <2ug/mg

Host protein <3ug/mg