GenScript Biotech 2017 Annual Result Presentation

April 12, 2018





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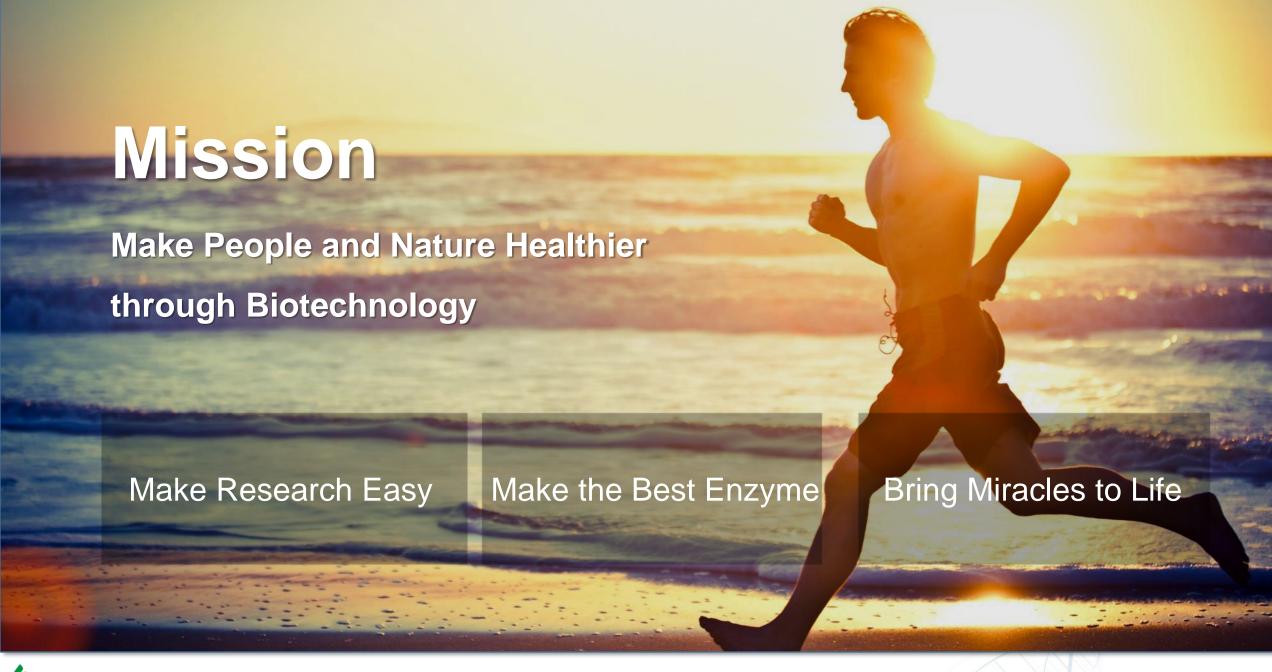


Content

> Company Overview

Background of the Industry
Business and Finance
Cell Therapy
Investment Highlights







Business Blueprint

CAR T-Cell Immunotherapy Industrial enzymes

Life sciences research and application services and products

Gene synthesis

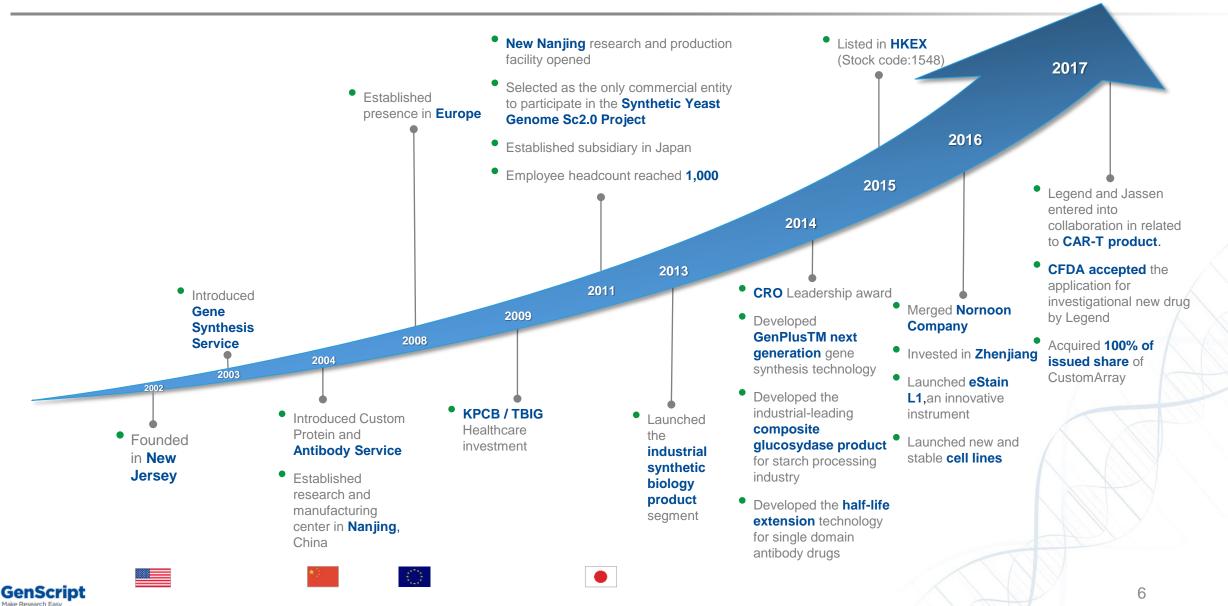
New Area of Business Development Generating Higher Return

Core Business Generating Cash Flow for Future Development

Genscript Proprietary Technologies



History & Milestone



Management Team



CEO Dr. Frank ZHANG

PhD, Duke University, 1995 Schering-Plough, 1995-2002 GenScript Co-founder, 2002



President Ms. Sally WANG

MS, Wuhan University, 1993
Shenzhen Futian,
Environmental Protection Surveillance
Station, 1993-2000
GenScript Co-founder, 2002



VP IR Mr. Robin MENG

Controller, Saint-Gobain, 2004-2007 CFO, Quay Magnesium, 2008-2010 VP Finance, GenScript, 2010-2017 VP IR, GenScript, 2017



CSO Dr. Li ZHU

VP Research, Cathay Biotech, Inc., 2006-2008 VP Strategy, GenScript, 2010



Company Overview



Positioning

- Largest provider of gene synthesis services globally;
- Global provider of life sciences research and application services and products;
- Well recognized and trusted provider of for synthetic biology research and application services and products;



IP & Patent

GenScript holds multiple IPs and know-how proprietary technology in the area of synthetic biology;



Locations

Key locations in New Jersey-USA, Nanjing-China, Amsterdam-Netherland, Dublin-Ireland, and Tokyo- Japan;



Customers

5,000+ customers which includes global pharmaceutical and biotech companies, colleges and universities, research institutes, government organizations and distributors in over 100 countries;



Employees

- over 2,100 employees globally;¹
- Employees locate in China, America, Europe and Japan:



R&D

- Research and manufacturing facilities globally;
- Three key research locations in China, America and Europe;



Content

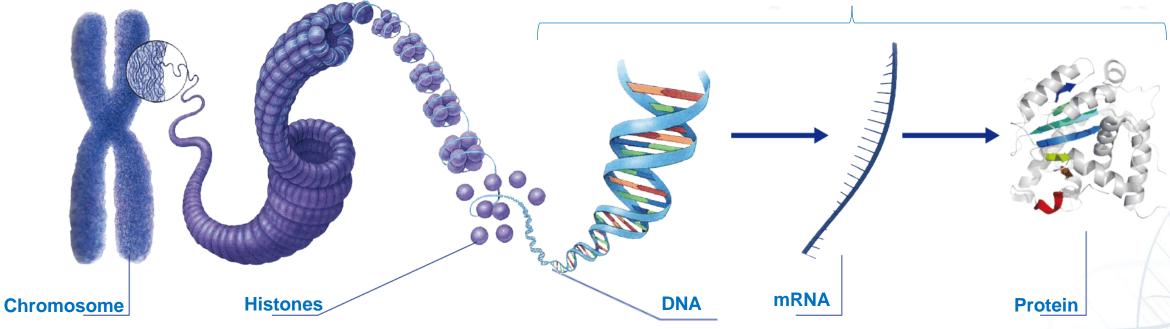
Company Overview

Background of the Industry Business and Finance Cell Therapy Investment Highlights



Industry Background – Molecular Biology

The Central Dogma of Molecular Biology



- Human has 23 pairs of chromosome –men have XY chromosome while women have XX chromosome;
- chromosome is made up of DNA and proteins called **histones**. The protein tightly coils the DNA to support the chromosome's structure:

- A **gene** is a molecular unit of heredity of a living organism;
- **DNA** is a polynucleotide formed from covalently linked deoxy ribonucleotide units:
- There are **four types of bases: A, T, C, G.** A pairs with T, and G pairs with C
- mRNA is transcribed from DNA that is used as an intermediate copy of DNA for making Protein
- Protein is the functional large biomolecule that allows organism to grow and reproduce



From Technology to Application

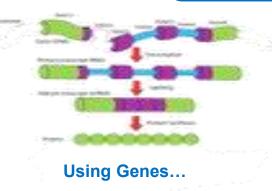
Gene Synthesis

- Synthesize genes from chemicals
- Do not rely on natural source for genes
- Able to synthesize genes as designed

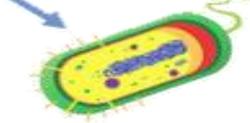
Synthetic Biology

The design and construction of novel biological parts, devices, and systems, and the re-design of existing, natural biological systems for purposes of improving usefulness.

Gene Synthesis
is one of the
fundamental
techniques in
synthetic
biology.



to Program Cells to Become Cellular Factories...



to Make High Value Products



Synthetic Biology Development History

Synthetic Biology is the design and construction of new biological parts, devices, and systems, and the re-design of existing, natural biological systems for useful purposes.

1911

Two Science paper used "Synthetic Biology"

2000

Synthetic Biology is widely used in the science area

2011

Synthetic Yeast 2.0

project was initiated globally and began the new milestone of Synthetic Biology

1980

A German journal published paper about the beginning of Synthetic Biology

2004

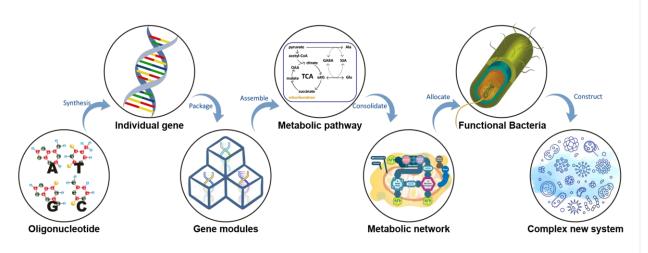
Synthetic Biology is rewarded to the one of the top 10 emerging technologies 2017

Synthetic biology achievement

is rewarded to the top 10 scientific progress in China

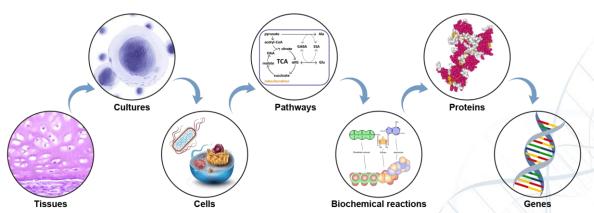


Synthetic Biology-Research Methods



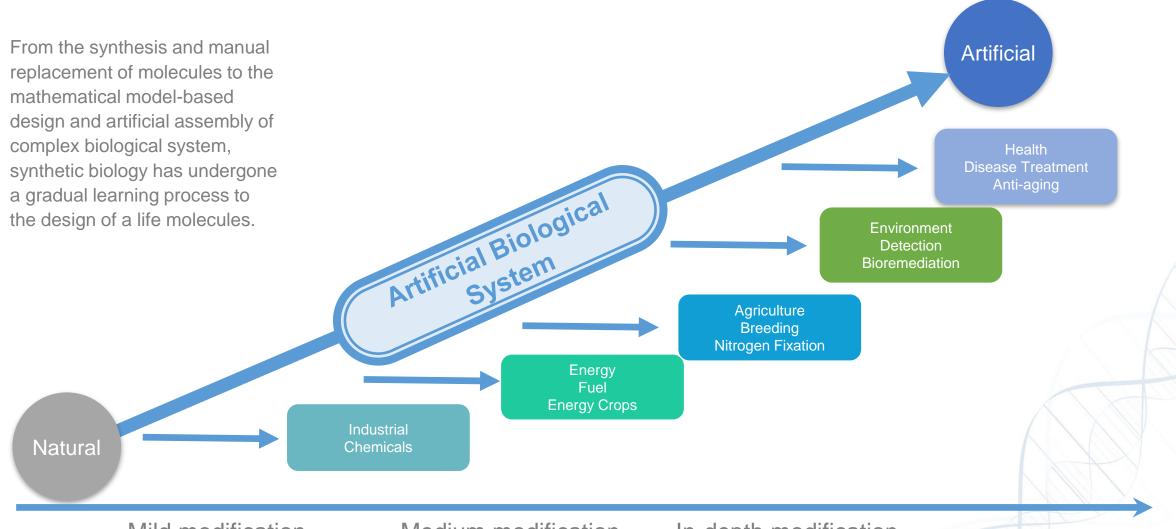
Bottom-Up: Basic molecules of life are redesigned, synthesized, assembled, and consolidated through metabolic pathways and networks, to systematically construct a brand new biological system.

Top Down: Systematically search and modify key cells, pathways, and biochemical reactions layer by layer, down to the most fundamental proteins, DNA, and RNA, in order to achieve target modification.





Synthetic Biology-Key Strategic Technology Frontier





Synthetic Biology Applications







Biofuel



Green chemistry



Natural products



- ✓ Synthetic biology technologies are widely used in biofuel generation
- √ The emergence of advanced conversion pathways and non-food feedstocks could unlock considerable production potential
- √ ~\$15 billion dollar market potential

- √ Many of the chemical processes can be converted into biological processes, using synthetic enzymes as catalyst
- ✓ Multi-billion dollar market potential through direct cost savings and avoided liability for environmental and social impacts
- √ ~\$10 billion dollar market potential

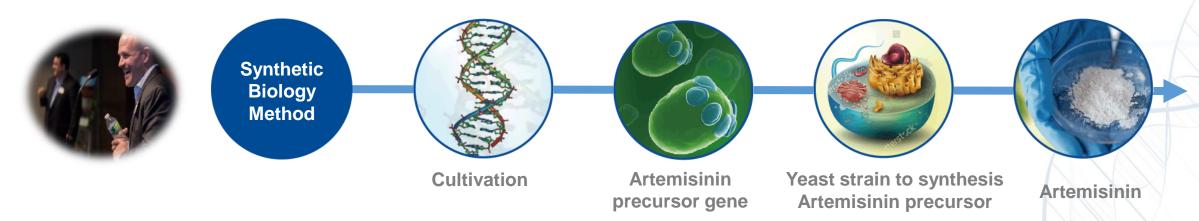
- ✓ The plant genes and pathway can be moved into bacteria and microbes by synthetic biology technologies to produce Taxol, artemisinin, isoprene rubber, saffron, vanillin, and flavor and fragrance
- √ ~\$10 billion dollar market potential



Synthetic Biology Application-Artemisinin Production



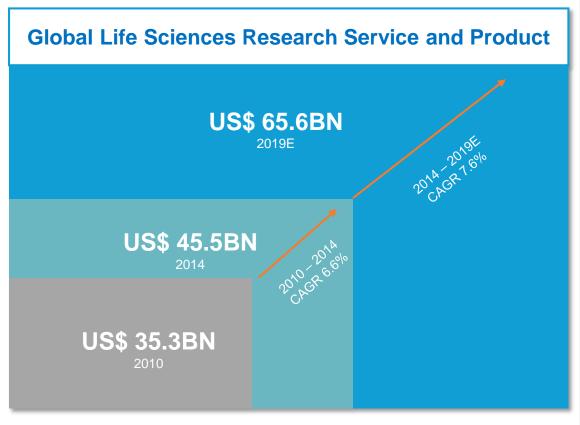
In 1972, the Chinese scientist Tu Youyou and her colleagues extracted artemisinin from the herb **artemisia apiacea** and received Nobel Prize in 2015.



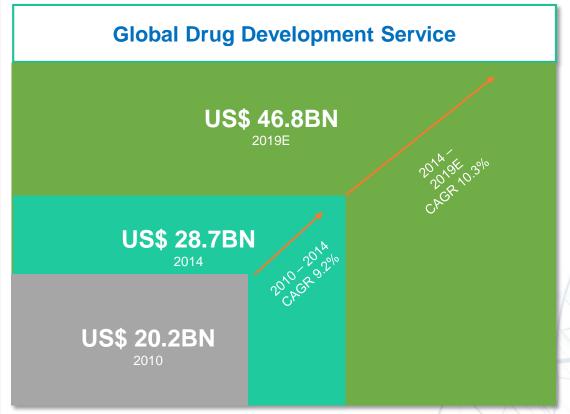
Jay Keasling's laboratory at the University of California, Berkeley has engineered both Escherichia coli and Saccharomyces cerevisiae to produce of **artemisinic** acid, a precursor to artemisinin.



Market Potential



- ☐ Increasing research and development expenditure
- Emergence of innovative facilitating platforms
- ☐ Growing demands for revolutionizing therapies for major diseases
- Applications in environmental industry

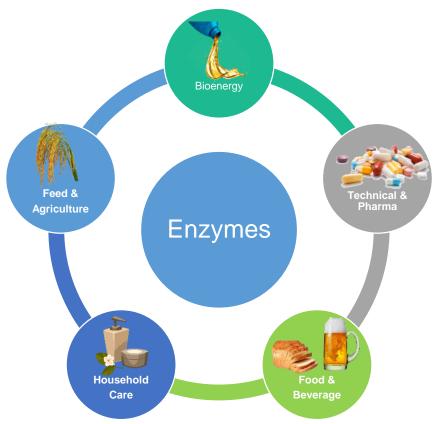


- ☐ Increasing demand for innovative therapeutic options
- □ Constraints faced by drug manufacturers higher incentives to engage drug development service providers to reduce cost and time required for drug development process
- ☐ Access to advanced research tools and technologies



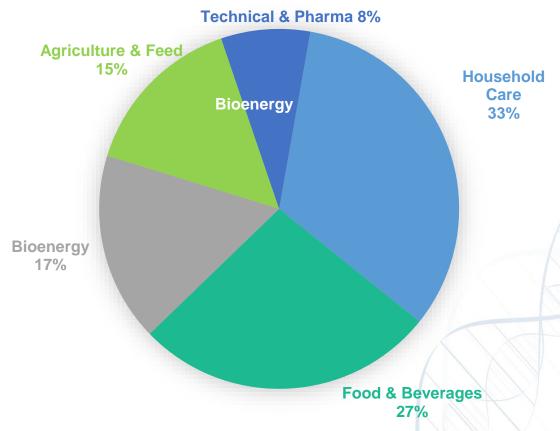
Market Potential

Enzymes Application



Industrial enzyme can be used in a variety of industries, such as the food processing, feed pharmaceutical, and chemical industries

Enzymes Market Breakdown



Industrial enzyme market globally totals approx. US\$6bn, Chinese market approx. US\$1.5bn.



Content

Company Overview

Background of the Industry

> Business and Finance
Cell Therapy

Investment Highlights



Business Overview – Branding Strategy





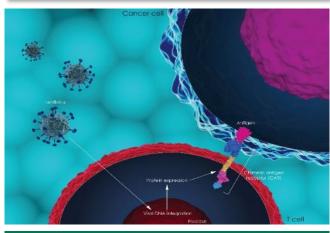
Bio-Science Services and Products





Industrial Synthetic Biology
Products





Cell Therapy Development



Bio-Science Services & Products

Life sciences research services and products



Services

- Gene synthesis
- · Oligonucleotide synthesis
- DNA sequencing
- Protein production
- Peptide synthesis
- · Antibody development

Products

- Cloning
- Gene editing
- Proteins & Antibodies, Isolation & Analysis
- Stable cell lines

Antibody drug discovery and development



Drug Discovery Services

- Target assessment & validation
- Hit generation & lead selection
- Lead optimization
- Candidate selection

Drug Development Services

- Production cell line development
- Process development



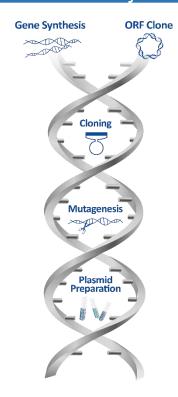
Pioneer and Largest Gene Synthesis Supplier in World

Successful delivery of more than 900,000 genes, successful rate 99.95%



Digital assets management

Over **98.5%** on-time delivery



One-stop gene studio

Largest capacity at 100 million bp/month

- ✓ PhD-level assistants
- ✓ Stronger molecular biology background
- √24H/5 connected

Professional service assistants



Antibody Drug Discovery and Development





Industrial Enzymes Business

Food Industry



Enzymes improve product quality or production efficiency for bread, dairy, grease, wine, fruit juices, beer and other food production.

Feed Industry



Enzymes improve animal feed intake, thereby promoting animal growth while reducing emissions of excrement pollution.

Starch Industry



Enzymes are used to convert starch to different kinds of sugars such as maltose, fructose and glucose, and can be further converted to alcohol.



Industrial Enzymes

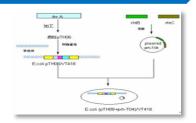
Bestzyme has established the Advanced R&D Platform and Up-to-Date Industrialization Transformation Platform in the industry, which covers the entire process from proof of concept, through R&D to commercialization production.



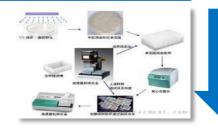
Gene Synthesis



Strain Construction



HT Screening



Application Tests



High Quality Products



Refinement & Condensation



Fermentation Expression





Global Presence



Strong Sales and Marketing Team

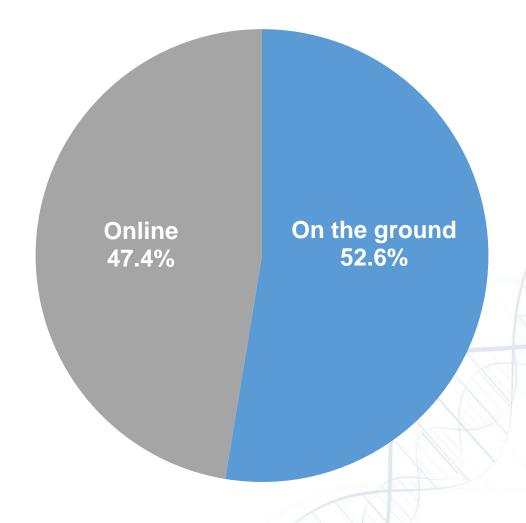
Well trained sales and marketing specialists

- Our success is attributed to our sales and marketing teams with presence in the U.S, EU, Japan. and the PRC
- Nearly 90% of our U.S. sales and marketing team have doctoral or master's degrees in life sciences- related discipline

Interactive online ordering system

- Customers navigate directly to our websites to browse online information of most of our services and products
- Our system allows for specification and customization of each order through the option to choose features and components from an online menu

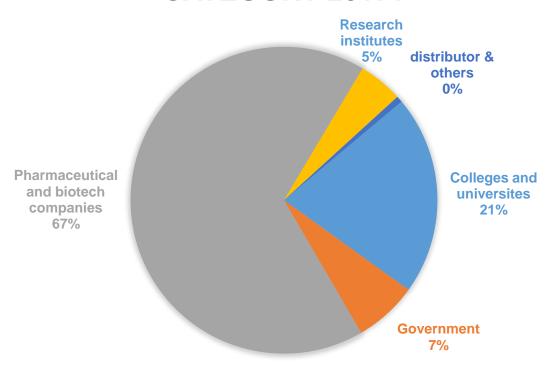
Number of Purchase Orders¹



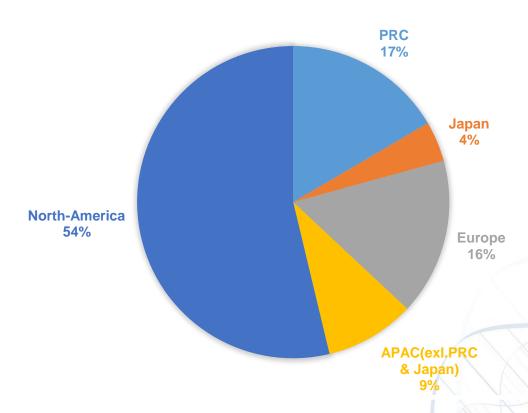


Global Diversified Customer Base

GLOBAL SALES-BY ORG CATEGORY 20171



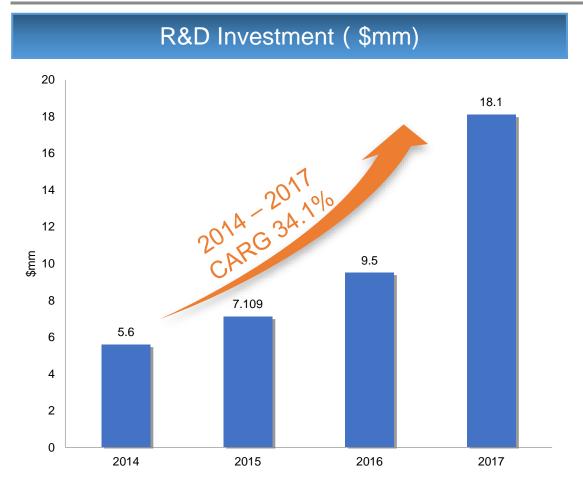
GLOBAL SALES-BY REGION 20171



5,000+ customers which include global pharmaceutical and biotech companies, colleges and universities, research institutes, government organizations and distributors in over **100 countries**



Research & Development



Over **8-12% of company's annual revenue** will be invested into R&D annually.

R&D Team and Patents

- 47 registered patents¹ and 107 pending patent
 ¹applications world-wide
- 4 R&D teams serving 4 business segments
 including Biotechnology Research Institute and
 Molecular Biology Research Institute
- Over 18% of our R&D¹ staff possess doctoral
 degrees in life sciences- related disciplines in biology,
 molecular biology, genetics, biological engineering,
 immunology, etc.



Academic Achievement

Synthetic Yeast 2.0



The Group has achieved promising results in the joint research and development effort with various international research and development institutions in the field of synthetic genomics with the aim to newly design and synthesize all 16 saccharomyces cerevisiae chromosomes, at the total length of 12 million base pair (Project Sc2.0). In March 2017, GenScript published promoting result on Science regarding the joint research and development in the Synthetic Yeast Genome Sc2.0 Project.

Academic Magazine



As of Dec. 31, 2017, over **27,300** international peer-reviewed high-impact journal articles had cited the use of GenScript's life sciences research and application services and products.



Capacity Expansion

GenScript Zhenjiang Capacity Expansion



- Choose Zhenjiang New District as new production base;
- Investment and registered capital: US\$30 million (in two phases);
- Zhenjiang will be one of our major production base in the future while Nanjing will play the role of R&D base;
- The new facility has come into production since August 2017;

Bestzymes Jinnan New Production Facility



- Covers an area of 120 acres
- fermentation capacity up to 900m³
- Annual production capacity 60,000 tons
- · Fermentation types: liquid and solid
- Fermentative species include bacteria,
- fungi, yeast and the like
- Solid formulations including powders,

GenScript Nanjing Infrastructure Expansion



- Extend exiting R&D facility;
- Focus on Antibody Drug Discovery & Development capability;
- Total Investment: US\$46 million;
- Gross area: 75,674 m²
- The new facility will be launched in 2018;



Merge & Acquisition

On 25 December 2017, GenScript acquired 100% of entire issued shares of CustomArray. CustomArray is incorporated in the State of Washington of United States of America and is a provider of oligo pools to many of the world's leading academic and industrial organizations for applications including targeted sequencing, complex DNA libraries, synthetic biology, shRNA libraries, and CRISPR. The patented, in situ synthesis of oligonucleotide microarrays uses advanced semiconductor technology to enable the synthesis of tens of thousands of oligonucleotides simultaneously.







Microarrays



ElectraSense Reader



Oligo Pools

- Combinatorial library
- Mutagenesis library
- gRNA library

High-throughput Automatic Platform

 Largely improve the gene synthesis flux and cut the cost

Micro Array

 Fulfill the new emerging requirements of DNA market, such as DNA storage



2017 Financial Performance

	2017 (US\$MM)	2016 (US\$MM)	% Change
Revenue	152.6	114.7	33.0%
Gross Profit	104.6	76.2	37.3%
Gross Margin	68.5%	66.4%	
Net Profit	27.0	26.5	1.9%
Net Profit Margin	17.7%	23.1%	
Adjusted Net Profit ²	<u>35.7</u>	<u>23.3</u>	<u>53.2%</u>
Adjusted Net Profit Margin	23.4%	20.3%	
Adjusted EBITDA ¹	53.4	34.4	55.2%
Adjusted EBITDA Margin	35%	30%	

- Achieved strong revenue YoY growth of 33.0%.
- Stable gross margin ratio that maintained above 68%
- Core services (bio-science research services and products) maintained market leadership and growth momentum.
 - > Revenue of bio-science research services and products amounted to US\$ US\$122.5 million, representing an increase of 13.7 %.
 - > Gross profit margin varied from 66.4 % for the same period last year to 68.5 % this year, and maintained at a stable level.
 - > Exerted considerable effort in simplifying the internal workflow of gene synthesis to shorten the turnaround time, enabled to maintain leadership position in gene synthesis.
- Revenue of industrial synthetic biology products increased by 68.3 % to US\$11.8 million. We have also been actively developing new products in the field of special enzymes.
- New business segments, namely Immunotherapy Treatment and Technology generated revenue of 18.3M.

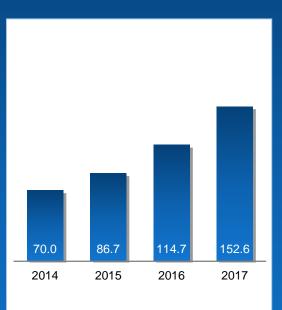


^{1.} Adjusted EBITDA=EBITDA excluding investment income/ loss, foreign currency exchange gain/loss, share-based payment expenses and listing expenses

^{2.} Adjusted net profit= excluding investment income/loss, foreign currency exchange gain/loss and share-based payment expenses and listing expenses

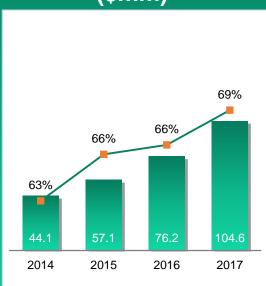
Financial Highlights





2014-2017 CAGR: **29.7%**2016-2017 Growth: **33.0%**

Gross Profit & Gross Margin (\$mm)



2014-2017 CAGR: **33.4**% 2016-2017 Growth: **37.3**%

Adjusted Net Profit² & Net Profit Margin (\$mm)



2014-2017 CAGR: **55.5%**2016-2017 Growth: **53.2%**





2014-2017 CAGR: **48.5**%

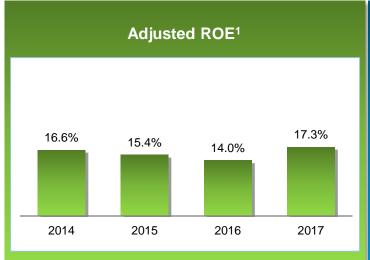
2016-2017 Growth : **55.2%**

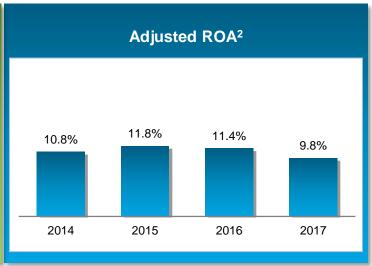


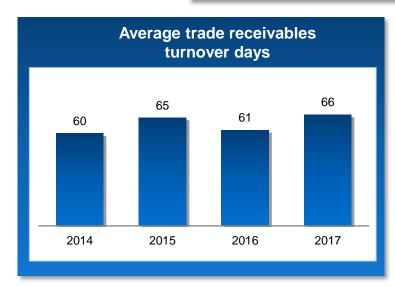
^{1.} Adjusted EBITDA=EBITDA excluding investment income/ loss, foreign currency exchange gain/loss , share-based payment expenses and listing expenses

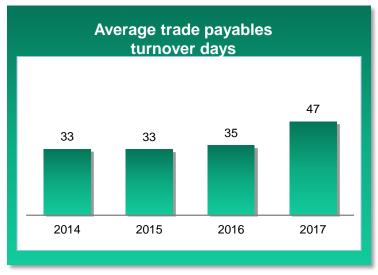
^{2.} Adjusted net profit= excluding investment income/loss, foreign currency exchange gain/loss and share-based payment expenses and listing expenses

Financial Highlights-Key Ratios













¹ Adjusted ROE was calculated based on adjusted net profit for the respective periods divided by the average total equity for the same periods and multiplied by 100% ² Adjusted ROA was calculated based on adjusted net profit for the respective periods divided by the average total assets for the same periods and multiplied by 100% ³⁵

Content

Company Overview

Background of the Industry

Business and Finance

> Cell Therapy
Investment Highlights



Multiple Myeloma

Facts about Multiple Myeloma

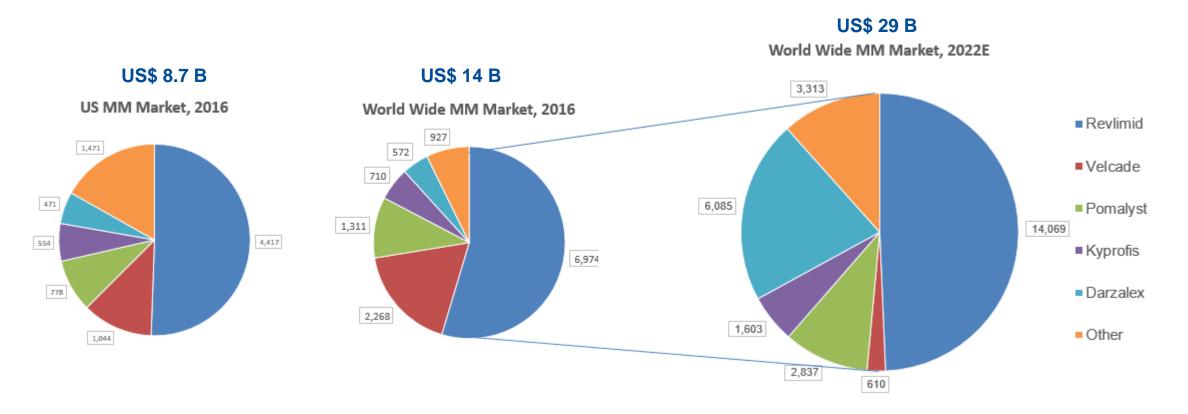
- Serious Cancer of bone marrow
- Over 30,280 new cases (6.6 per 100,000 men per year) diagnosed each year in the US
- About 120,000 patients exist in the US at any one time
- Trend towards patients above the age of 55
- Still considered incurable because all available firstline therapy will eventually encounter disease resistance and unavoidable disease progress.
- 5 year survival rate in US is still < 50%







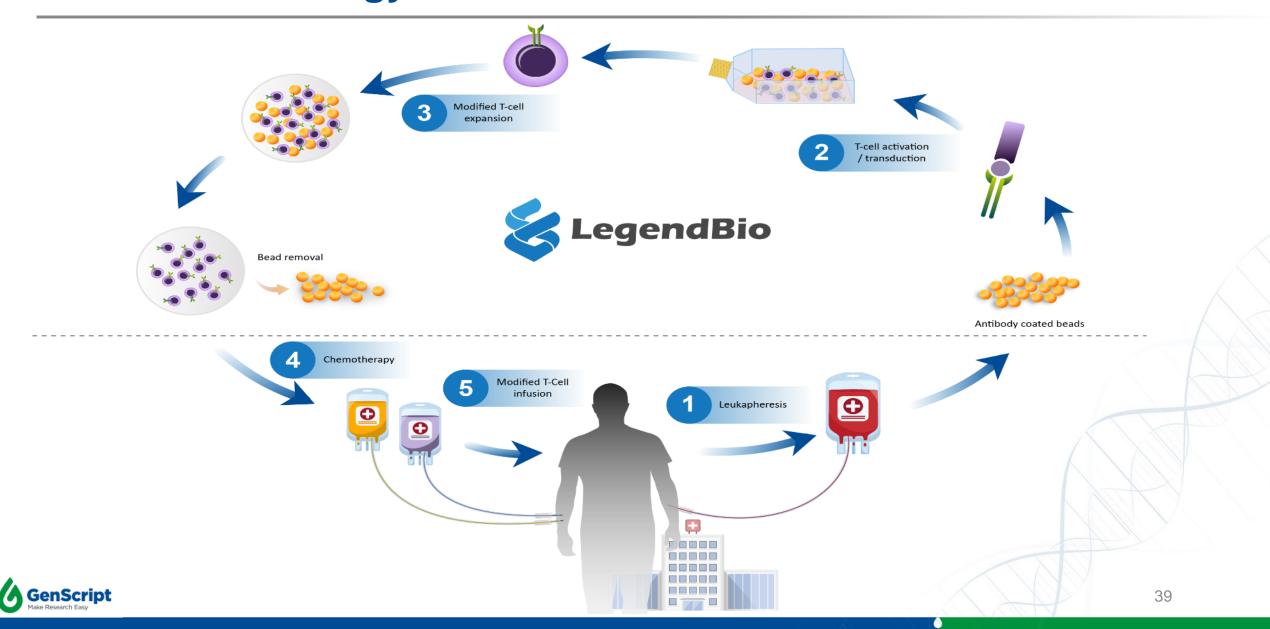
Multiple Myeloma Total Market Revenue



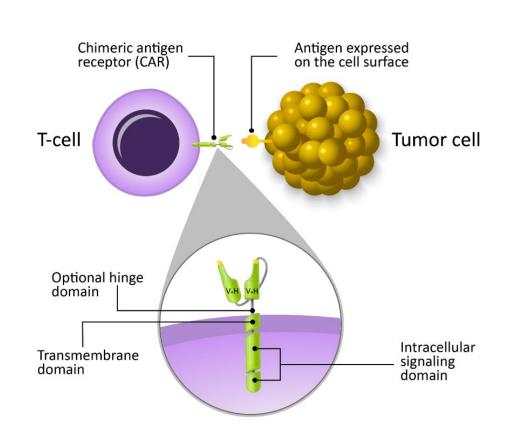
- The Global MM market reached \$14 Billion USD in 2016, US contributed 62% of the market, at ~8.7 Billion
- The patent of Revlimid, currently the top-selling drug used in all settings of multiple myeloma, is anticipated to expire in 2019 in the US and in 2022 in the EU5 (France, Germany, Italy, Spain, and UK)

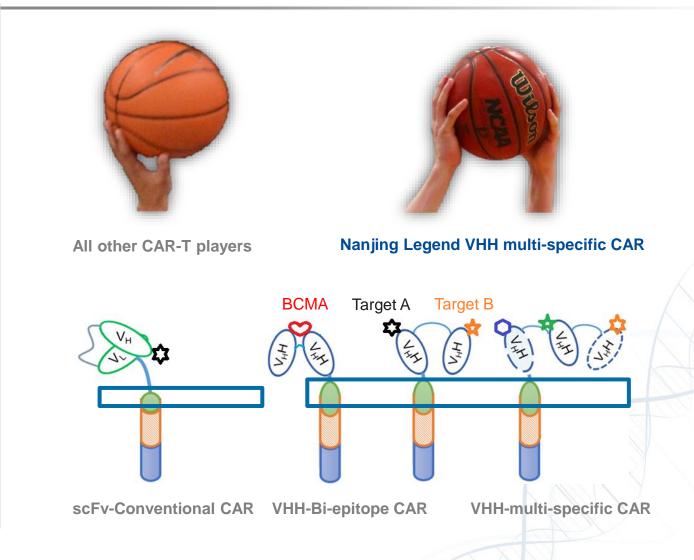


CAR-T Technology Process



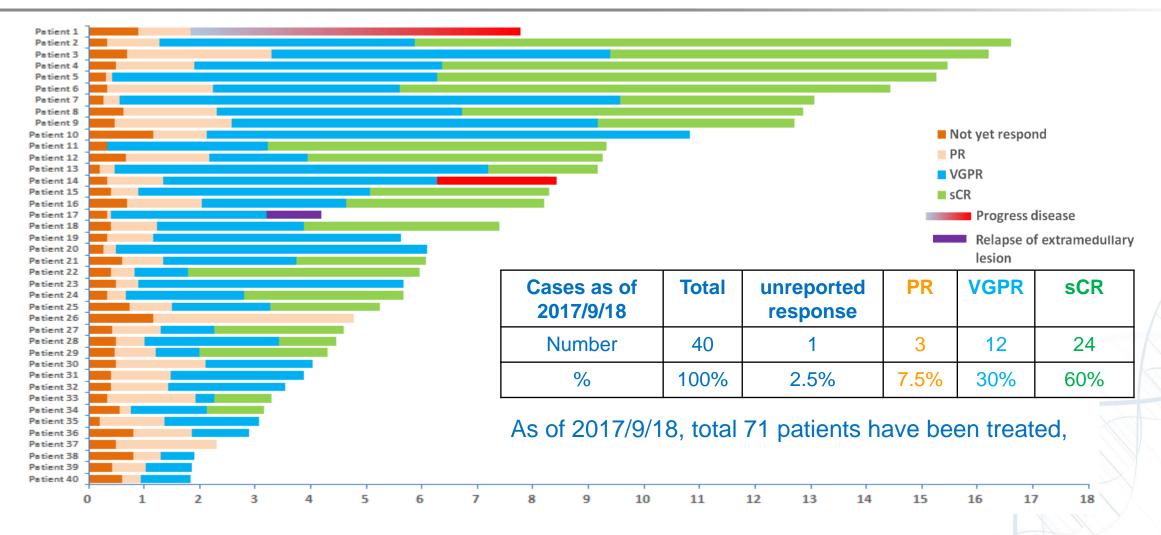
Innovative Design of CAR by Legend







Sustained Efficacy of LCAR-B38M CAR-T Therapy



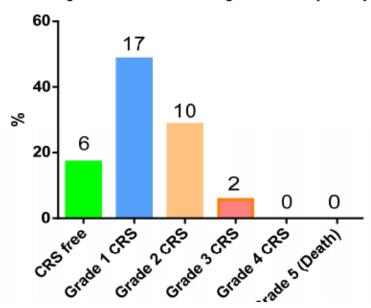
Time since LCAR-B38M CAR-T infusion (Months)

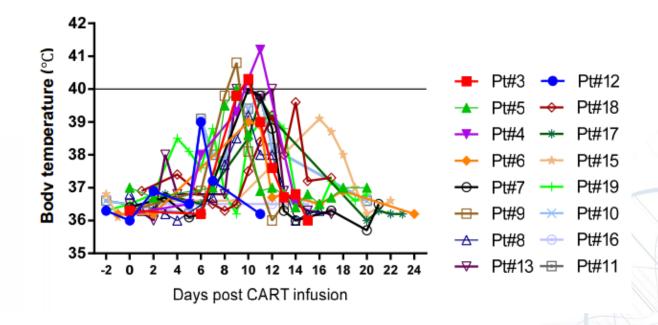


LCAR-B38M (cont.)

Adverse Event, n (%)	Patients (N=35)
Grade ≥3 adverse event	2 (5.7%)
Serious adverse event	0 (0)
Fatal events excluding disease progression	0 (0)

Cytokine release syndrome (CRS)







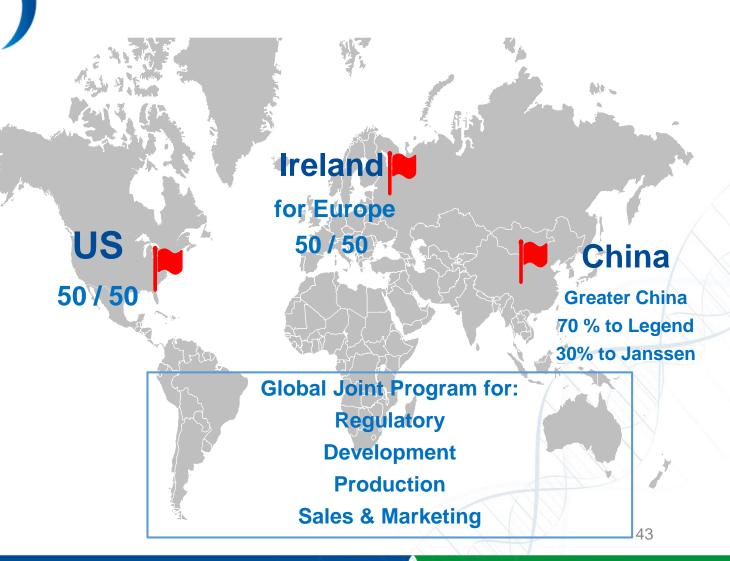
Collaboration between Legend and Janssen



janssen

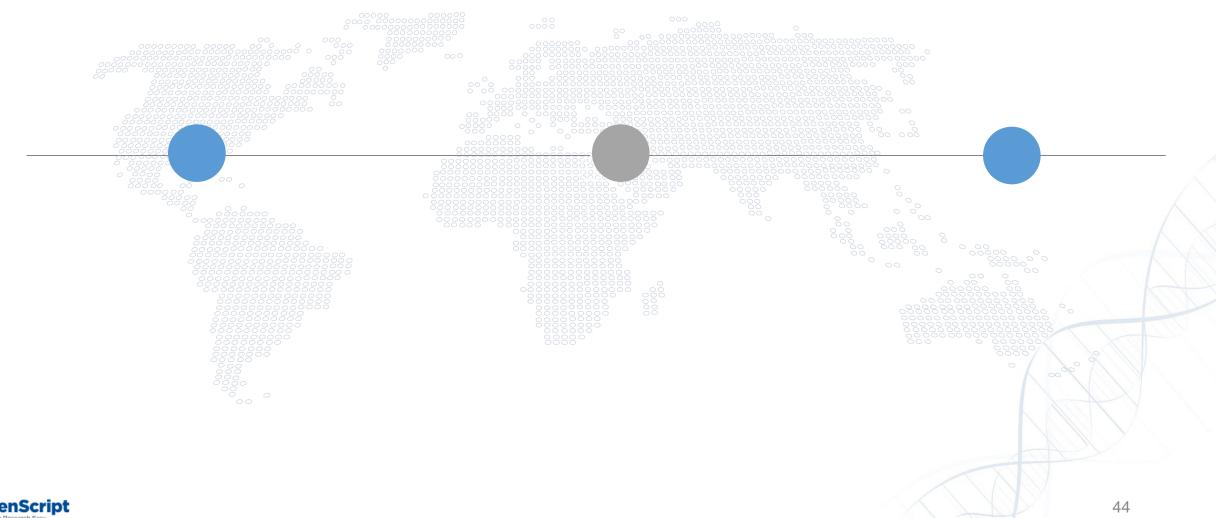
On 22 December 2017, Legend Biotech and Janssen Biotech entered into a collaboration and license agreement.

- Global co-development, co-production and co-promotion program for LCAR-B38M Car-T Cell Immunotherapy Collaboration;
- Legend received an upfront payment of \$350 million, and will receive additional development, production performance, regulatory and sales milestone payments;
- Profits and costs to be shared 50/50 worldwide, exclusive of Greater China, where 70 percent to Legend and 30 percent to Janssen;





What's Next ... for 2018 and beyond





Content

Company Overview
Background of the Industry
Business and Finance
Cell Therapy





Future Strategy



R&D Enhancement

Increase investment in research and development projects like cell therapy and other applications to expand our research and application service and product portfolio;

Production Capacity Expansion

Enhance production capacity to capitalize on the strong demand for our life sciences research and application services and products;

Global Market Penetration

Increase penetration into the overseas and PRC markets by expanding and strengthening our sales and marketing team;

Strategic Acquisition

Pursue strategic acquisitions and cooperation against the cutting-edge techniques to complement organic growth.



Investment Highlights

World Market Leadership

We have achieved world market leadership in the global gene synthesis service market with recognized stature in synthetic biology, and we offer a broad and integrated life sciences research and application service and product portfolio.

Strong Sales & Marketing Force

We maintain a strong sales and marketing team and operate an interactive online quotation and ordering platform to support our global sales

Experienced Management Team

We have an experienced and professional management team supported by a strong talent base

CAR T-Cell Therapy

We have achieved innovative breakthrough for CAR T-Cell Immunotherapy in clinical trial

Well Known & Trusted Brand

We are a well-known and trusted brand underpinned by our high quality life sciences research and application services and products

Innovative R&D Capability

We possess strong research and development capabilities, with a proven track record and a robust service and product pipeline

Mature Enzymes Pipelines

We have a complete and mature enzyme production line to serve the broad industrial market





