

The logo features the letters 'TTV' in a bold, red, italicized font, followed by 'BIOPHARM' in a white, italicized font with a registered trademark symbol. The entire logo is set against a black diamond-shaped background.

TTV BIOPHARM®

台灣東洋藥品

WELCOME TO JOIN US

March, 2019

Safe Harbor Statement

This presentation contains certain forward-looking statements.

These forward-looking statements may be identified by words such as 'believes', 'expects', 'anticipates', 'projects', 'intends', 'should', 'seeks', 'estimates', 'future' or similar expressions or by discussion of, among other things, strategy, goals, plans or intentions. Various factors may cause actual results to differ materially in the future from those reflected in forward-looking statements contained in this presentation, among others:

1. pricing and product initiatives of competitors;
2. legislative and regulatory developments and economic conditions;
3. delay or inability in obtaining regulatory approvals or bringing products to market;
4. fluctuations in currency exchange rates and general financial market conditions;
5. uncertainties in the discovery, development or marketing of new products or new uses of existing products, including without limitation negative results of clinical trials or research projects, unexpected side-effects of pipeline or marketed products;

6. increased government pricing pressures;
7. interruptions in production
8. loss of or inability to obtain adequate protection for intellectual property rights;
9. litigation;
10. loss of key executives or other employees; and
11. adverse publicity and news coverage.

TTY Biopharm cautions that this foregoing list of factors is not exhaustive. There may also be other risks that management is unable to predict at this time that may cause actual results to differ materially from those in forward-looking statements.

You are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date on which they are made. TTY Biopharm undertakes no obligation to update publicly or revise any forward-looking statements. Any statements regarding earnings growth is not a profit forecast and should not be interpreted to mean that TTY Biopharm's earnings or earnings per share for this year or any subsequent period will necessarily match or exceed published earnings or earnings per share forecasts of TTY Biopharm Company Limited.

Our Mission

We have been striving to extend liposomal & microsphere depot platform technologies for treatment of various diseases.

Our Target is to improve health and quality of life through innovative, cost-effective therapeutics and specialty drugs.

Our focus is on the **“Unmet Medical Needs”** in challenging diseases throughout the world, such as Cancer, CNS, Autoimmune, Diabetes Mellitus & Infectious Diseases.

Agenda

Company Overview

Product Strategy

Product Pipeline

Manufacture Facilities

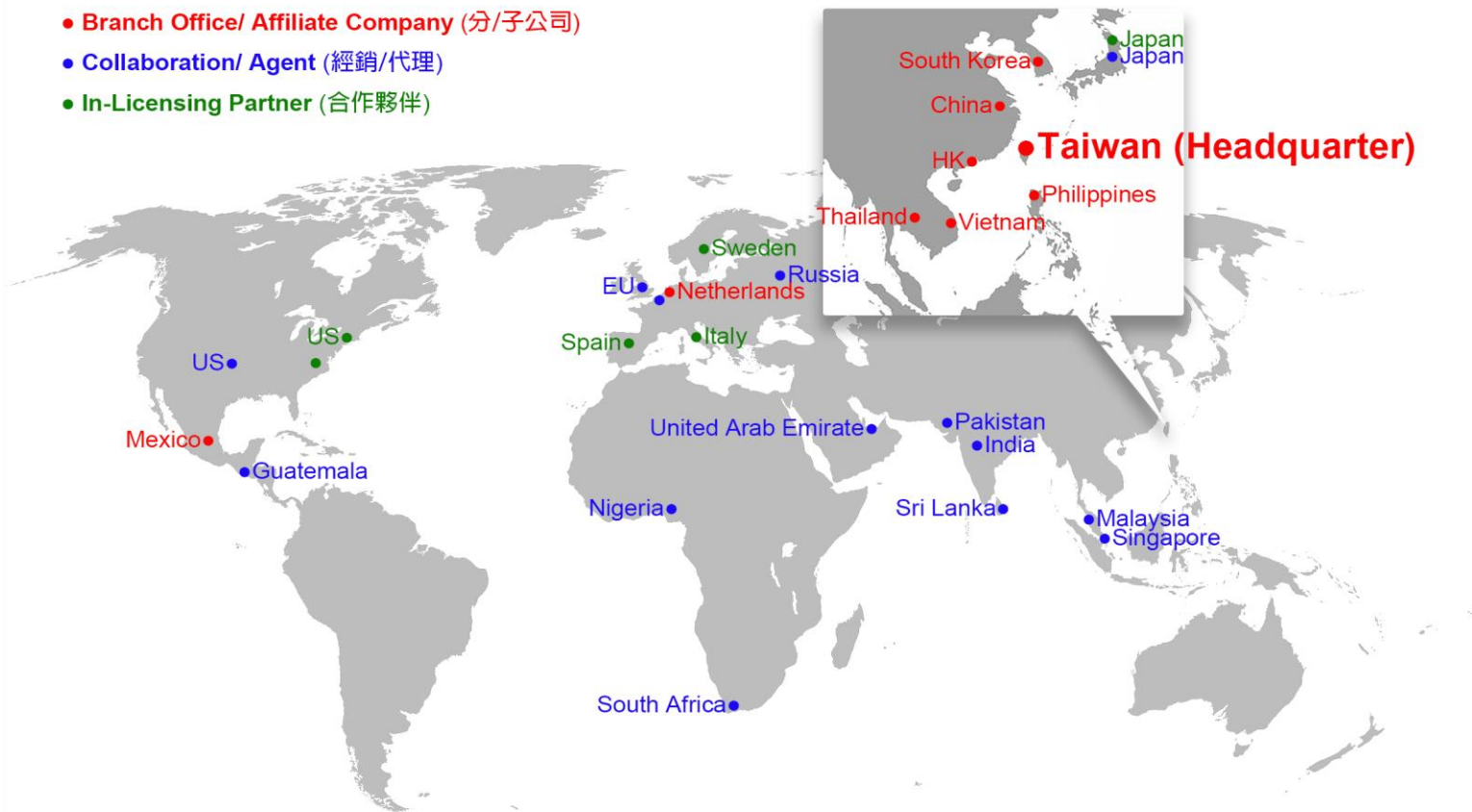
Successful Product Categories

In Progress Status

Biotech Success

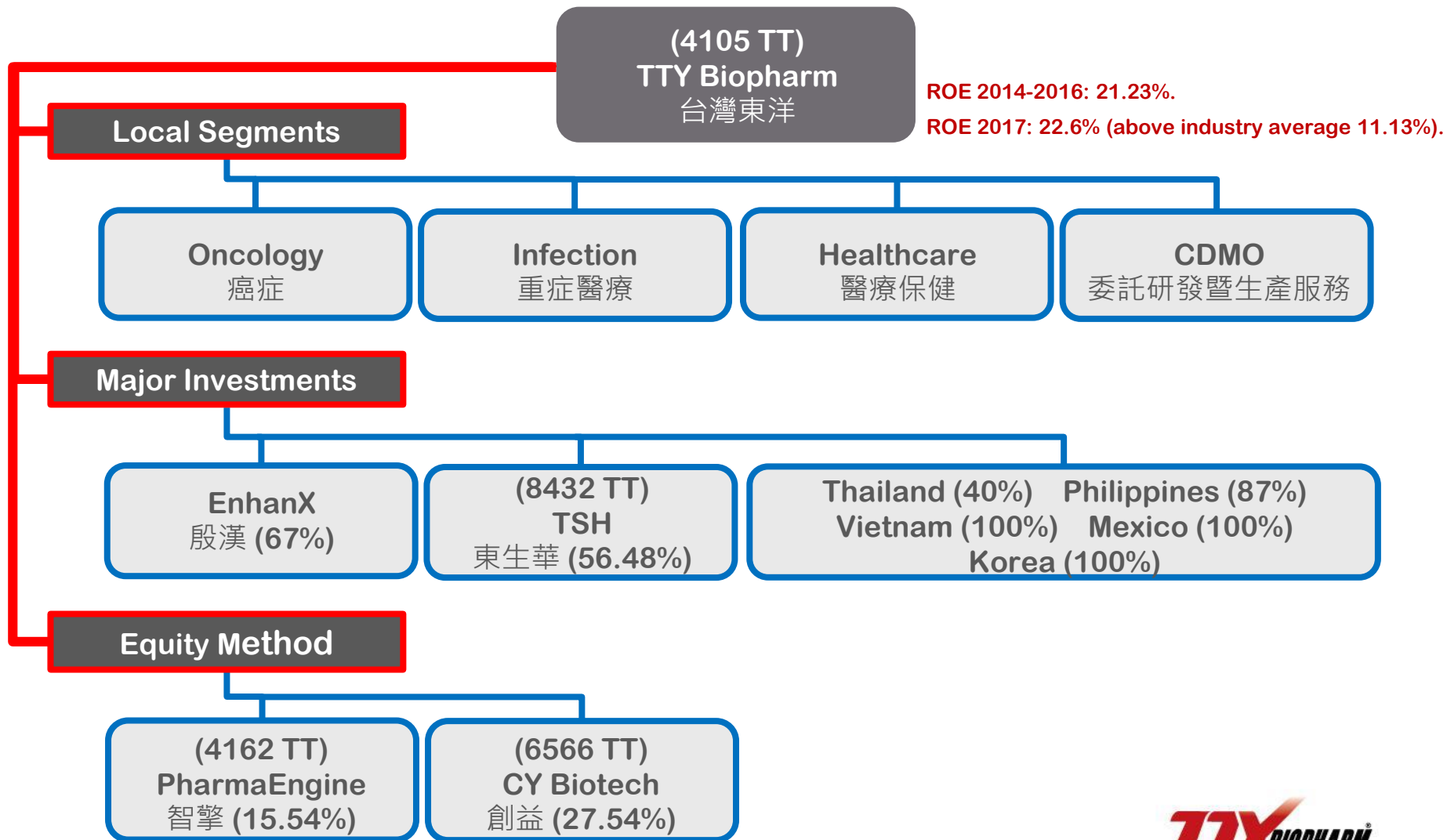
Company Overview

- Branch Office/ Affiliate Company (分/子公司)
- Collaboration/ Agent (經銷/代理)
- In-Licensing Partner (合作夥伴)



- Founded in 1960, restructured in 1996
- Traded in the Taiwan TPEX (2001, Code: 4105);
- Shares outstanding: 248.65 Million Shares (December, 2018)

- TTY Biopharm consolidated sales as of
2018- NTD 4.06B (USD 132M) Unaudited
2017- NTD 4.08B (USD 134M)
- Headquarter: Taipei, Taiwan
Number of employees: 530



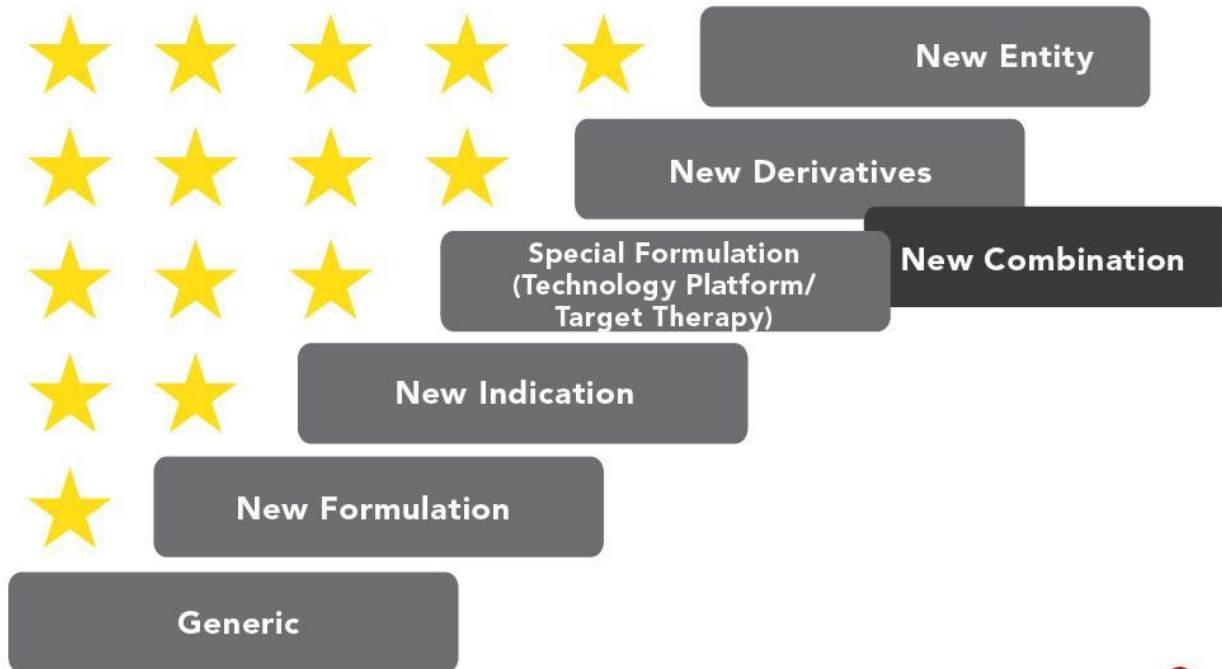
TTY Core Competences



Product Strategy

Trends for Pharmaceutical Industry

Market Scope
(Risk)



Entry Barrier
(Profit)



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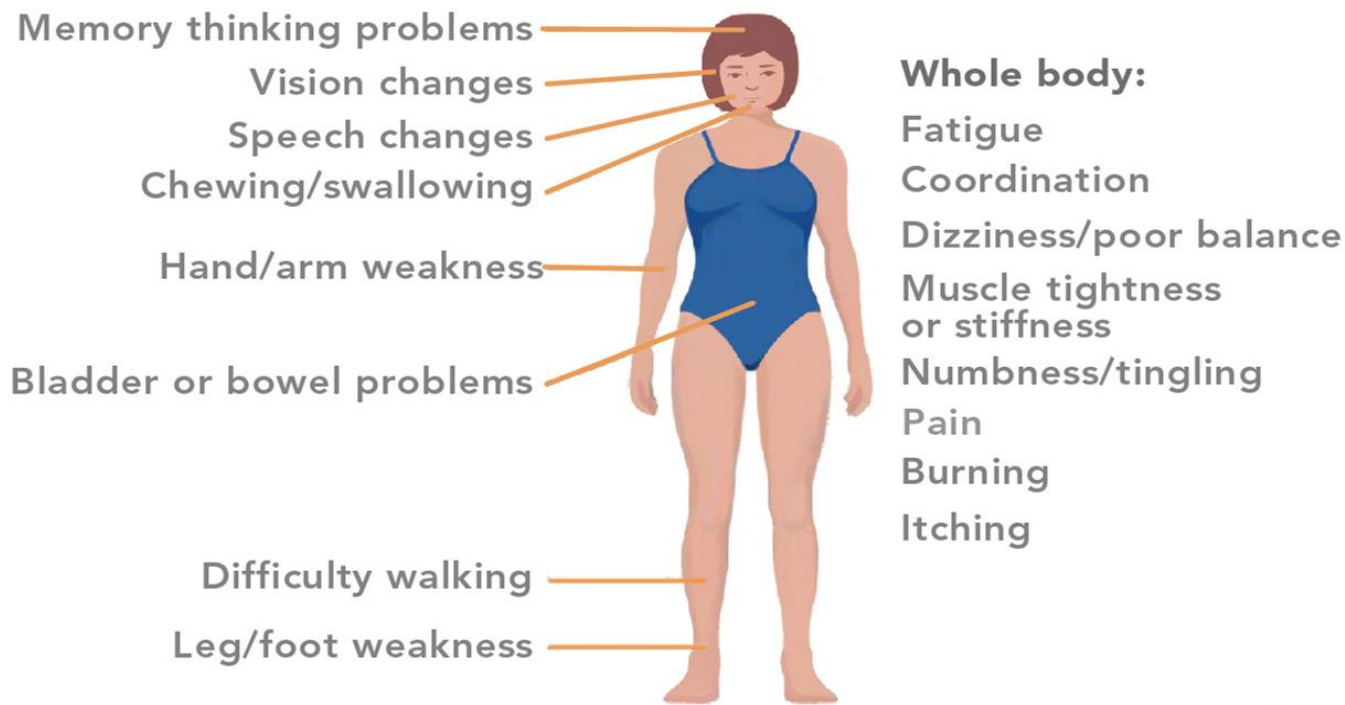
Products	World Market USD/M	Core Technology	Advantages
Caelyx/Doxil	600	Pegylated Liposome Technology	Worldwide Manufacturing Patent
Pegylipo			
Lipo-AB	440	Liposome Technology	Worldwide Manufacturing Patent
Octreotide	1,500	Microsphere Formulation	PLGA, Star Polymers Synthesized by TTY.
Colimycin	150	Formulation	First Choice Irreplaceable Options, TWNIH
ENX-201	1,700	Liposome Technology	Penetrating Blood-Brain-Barrier (BBB) capability
Leuprolide Acetate Injection	1,240	Lupron Depot Microsphere Formulation	Worldwide Manufacturing Patent
Risperidone Injection	960	Microsphere Formulation	Worldwide Manufacturing Patent
LGIA10	910	Microsphere Formulation	Worldwide Manufacturing Patent Microsphere Depot Platform

Introduction of MS

MS: a chronic, autoimmune & neurodegenerative disorder

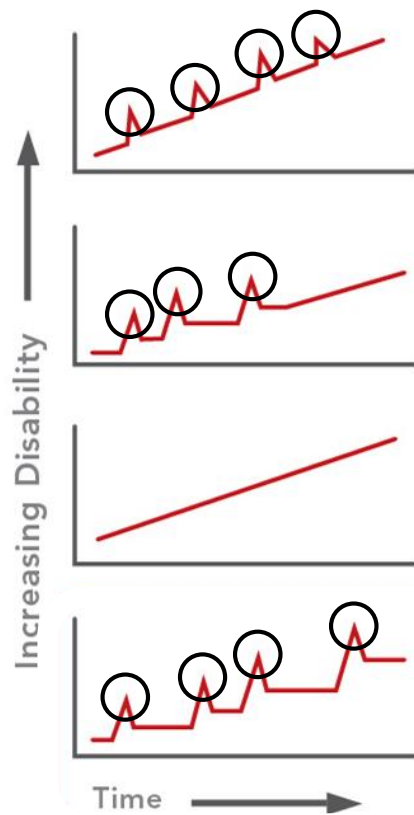
Body's own defensive system attacks myelin

- Inflammatory damage in the brain and spinal cord
- Loss of myelin and axons (scars at multiple sites)
- Neurologic disability



Introduction of MS

Four Classifications of MS



PRMS Progressive Relapsing MS
Steady decline since onset with super-imposed attacks.

SPMS Secondary Progressive MS
Initial RRMS that suddenly begins to decline without periods of remission and relapses.

PPMS Primary Progressive MS
Gradual progression of the disease from its onset with no relapses or remissions

RRMS Relapsing/Remitting MS **85%~90% patients**
Unpredictable attacks which may or may not leave permanent deficits followed by periods of remission

Either one of the four classifications occurs in acute is the target patient pool of ENX-201.
不管屬於哪一個發病類型，只要是急性復發，就是ENX-201的target病患。

Introduction of MS

World distribution of multiple sclerosis: greater prevalence in higher northern and southern latitudes

GLOBAL DISTRIBUTION OF MS

-  HIGH RISK
-  PROBABLE HIGH RISK
-  LOW RISK
-  PROBABLE LOW RISK
-  NORTH-SOUTH GRADIENT RISK
-  OTHER RISK

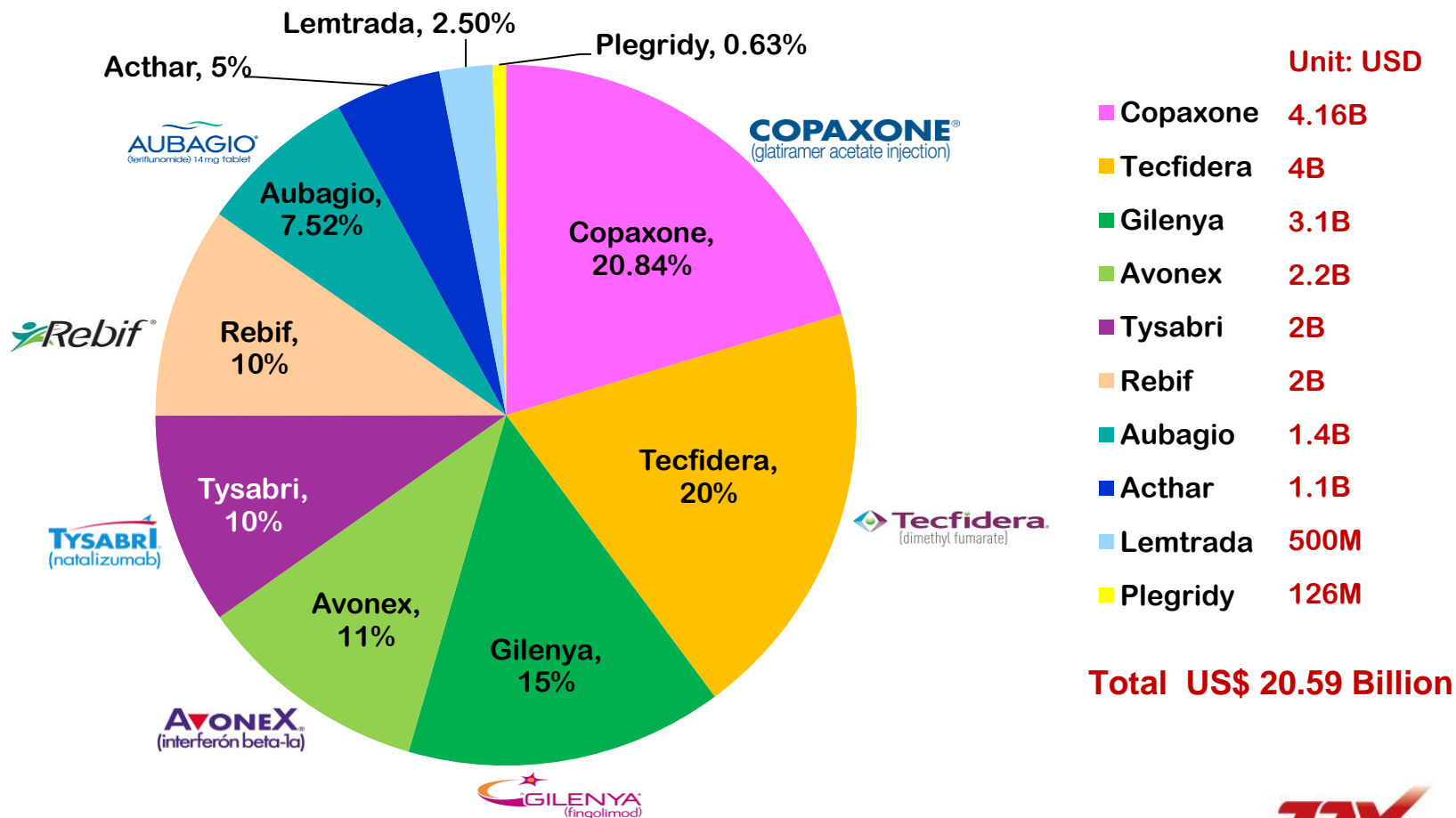


Females : Males = 4 : 1

**Around
2.5 millions**

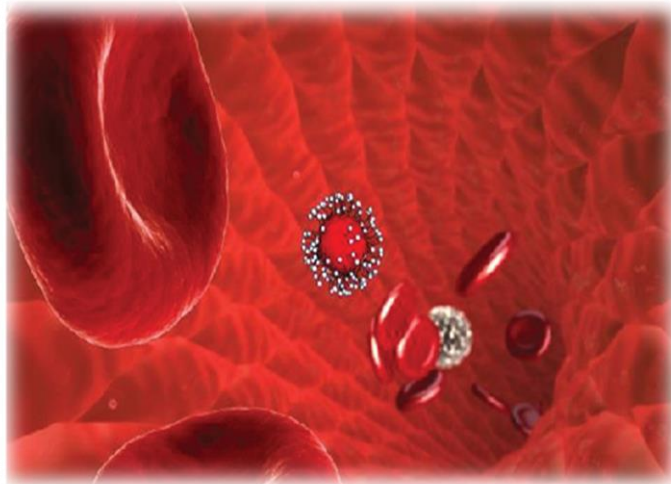
Introduction of MS

Major existing choices for MS treatments (2016 Sales & Market Share in Value)

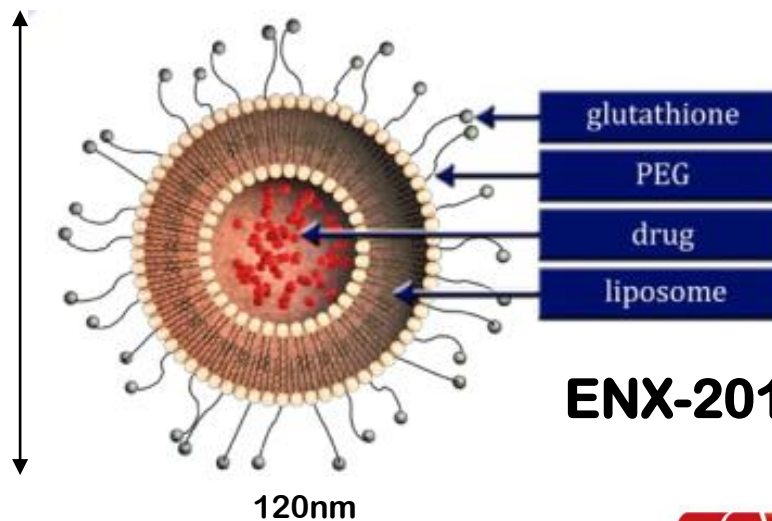


<https://www.fool.com/investing/2016/07/26/an-investing-overview-of-the-multiple-sclerosis-ma.aspx>

Introduction of the Product

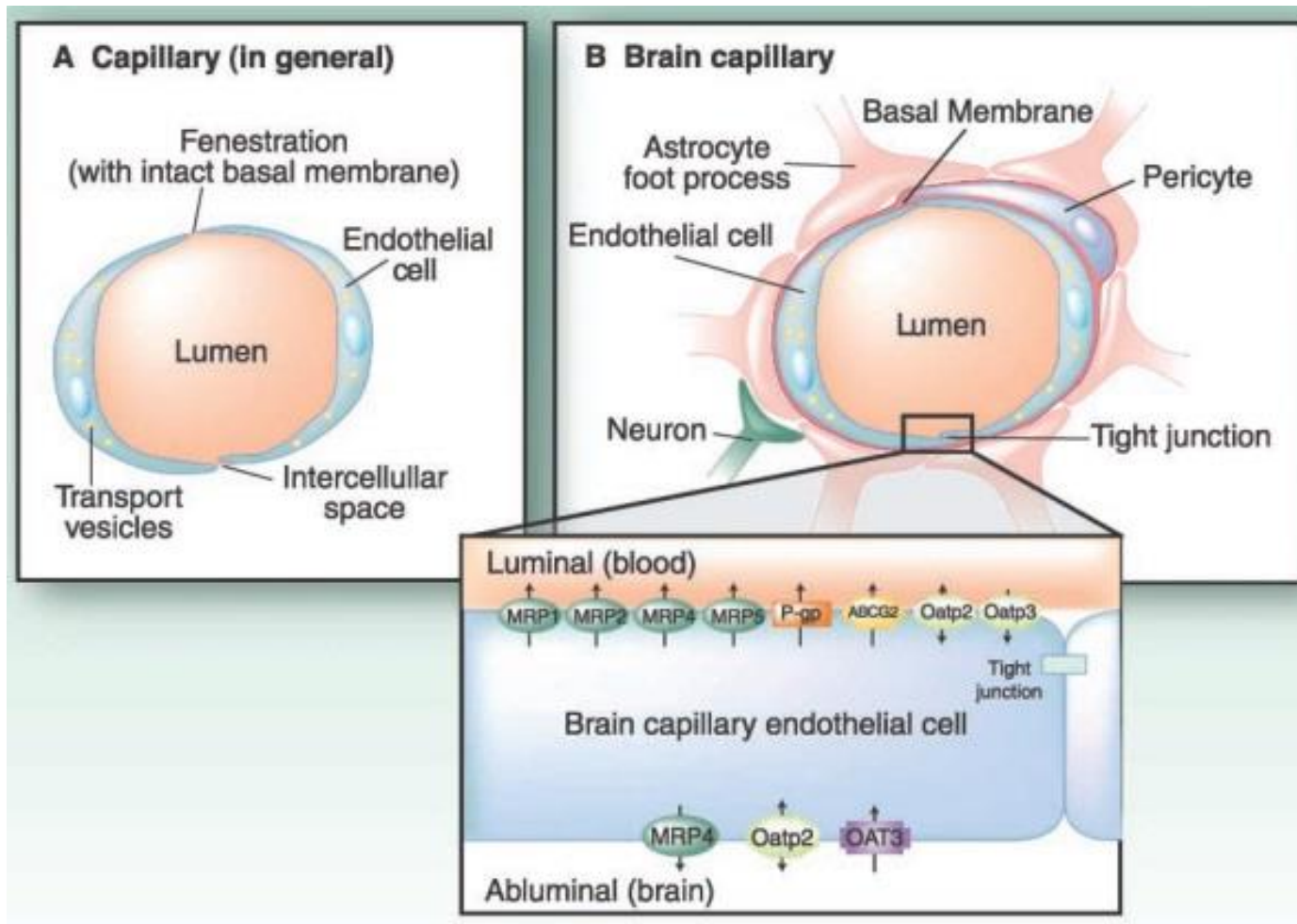


Targeting Liposomal Methylprednisolone Injection (glutathione PEGylated liposomal methylprednisolone) is being developed for patients suffering from acute and chronic neuro-inflammatory diseases, with an initial focus on patients with acute MS relapses.



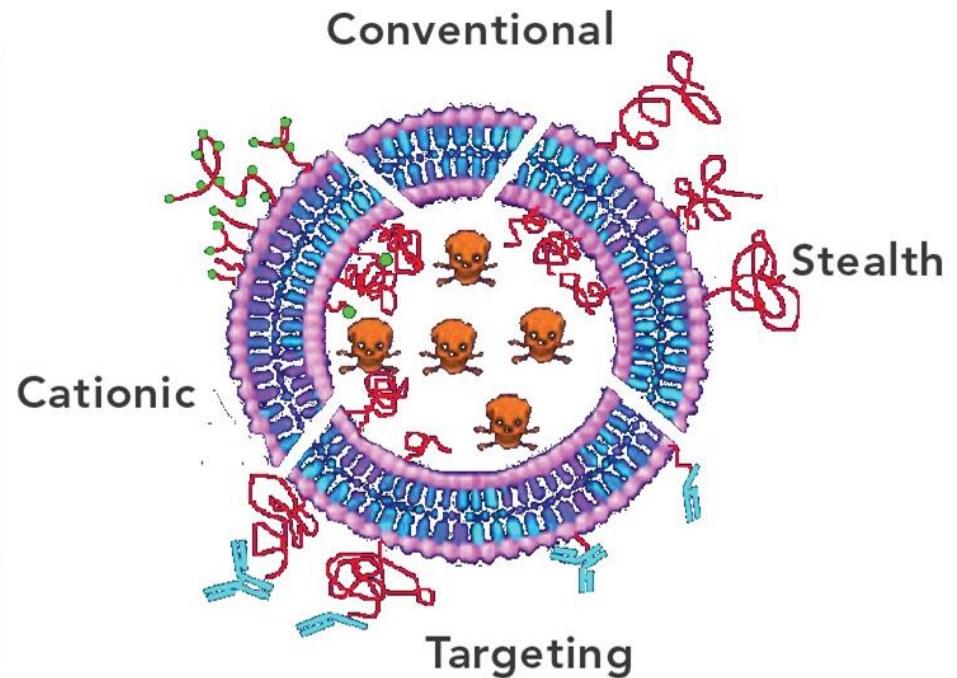
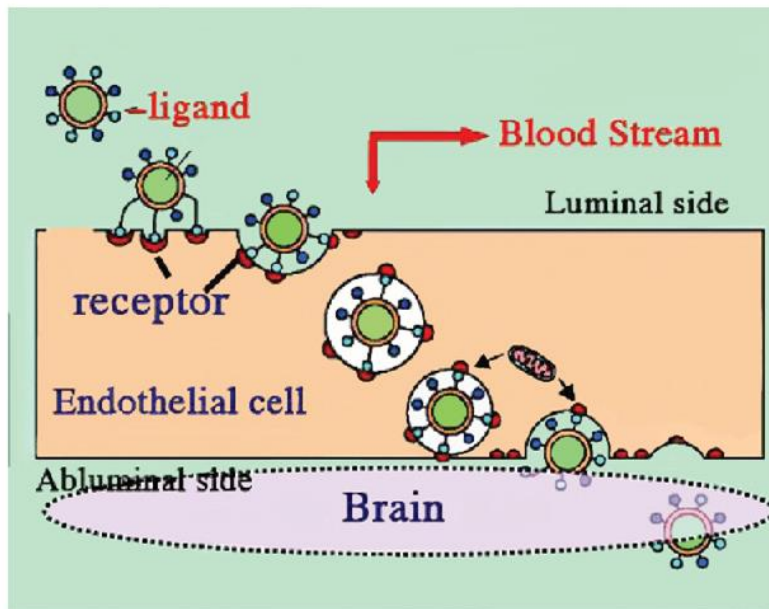
ENX-201

Introduction of BBB



ENX-201 Introduction

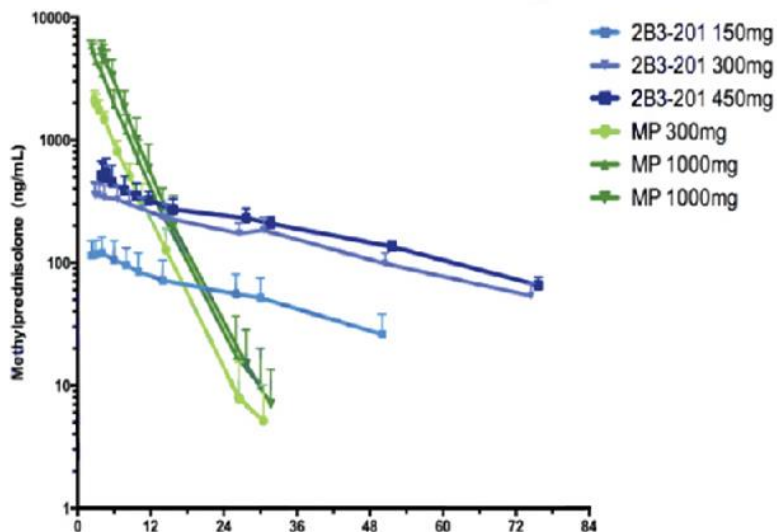
Effective drug delivery to across the blood-brain barrier (BBB)



Phase I Study (Solution)

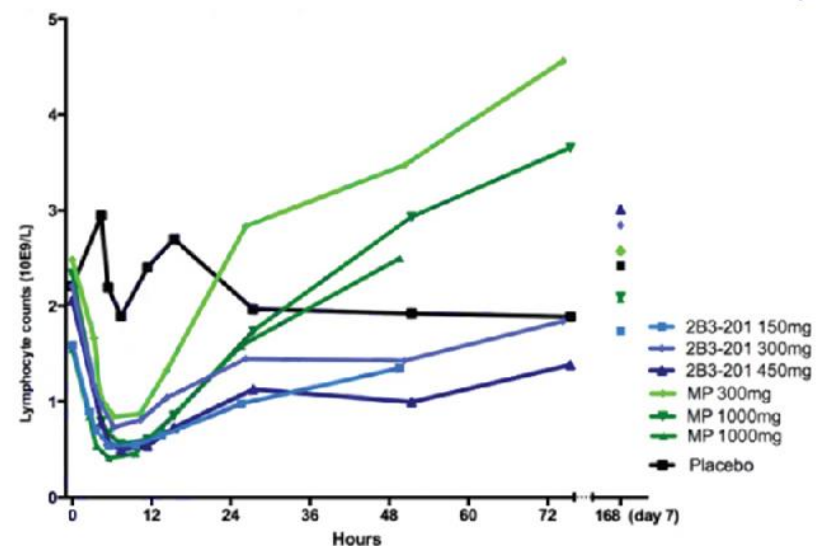
Phase I dose-escalation results Pharmacokinetics

- Long circulation half-life of ENX-201 (23~28 hrs) vs. MP (2.5 hrs)
- Reduced high peak exposure



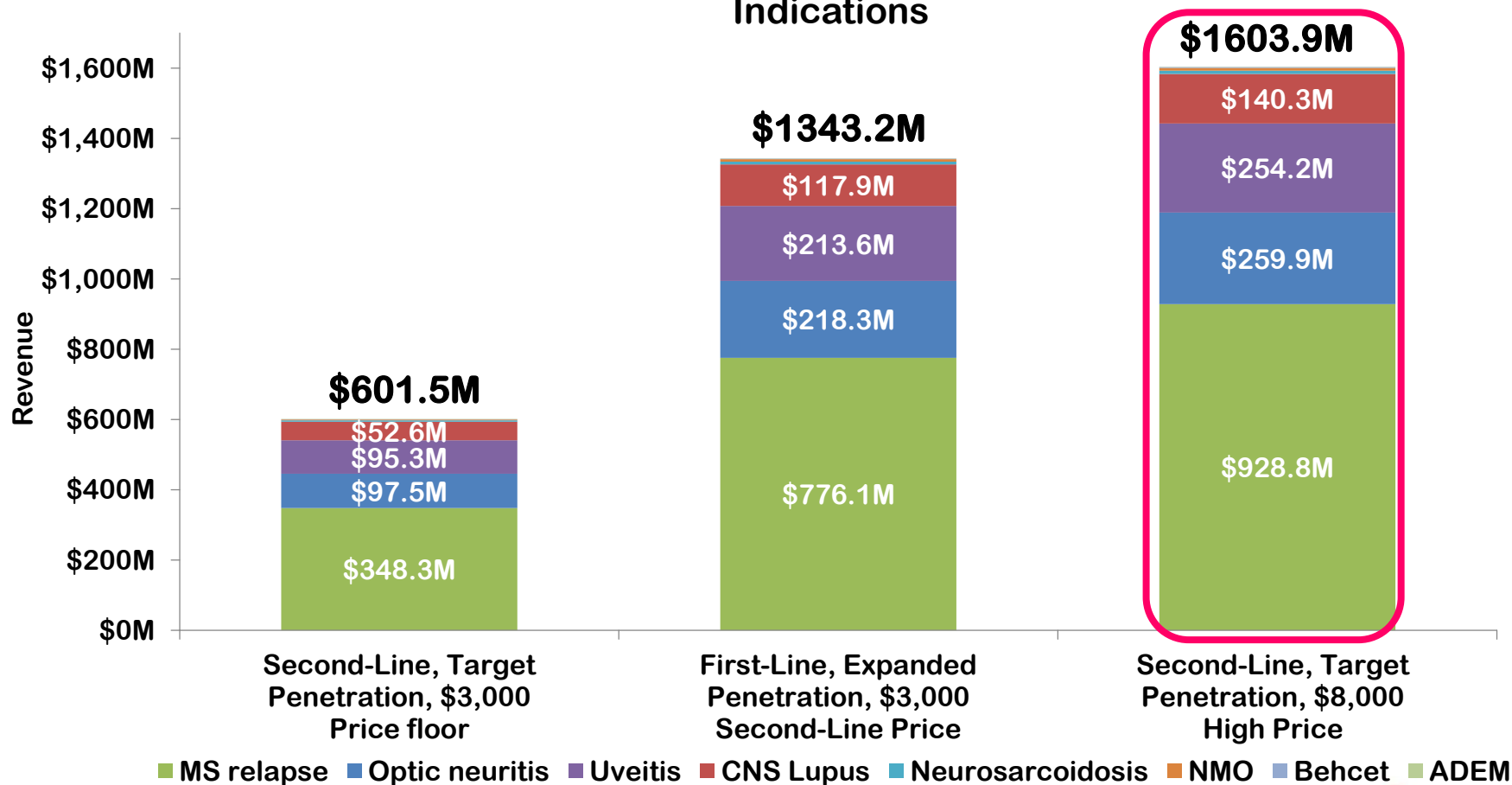
Phase I dose-escalation results Effect on lymphocytes

- Rapid and sustained immunosuppressive effect
- Lymphocyte count crossed baseline within 7 days in all groups



Potential Market Size

ENX-201 US Peak Year Revenue – MS & Other Inflammatory Indications



ENX-201 Development Strategies

▪ ENX-201's strengths

- *ENX-201 is a pegylated liposome which glutathione is attached on its lipid, while methylprednisolone as the main substance is encapsulated inside.*
- *Compared with the standard of care, i.e., a free methylprednisolone, ENX-201 is an **one-shot** intravenous injection which brings home-care convenience and better tolerance to patients suffering acute multiple sclerosis relapses.*

ENX-201 Pipeline

ENX-201 : Liposomal Methylprednisolone Injection (glutathione PEGylated liposomal methylprednisolone)

	2014-2016			2017			2018			2019			2020			2021			2022			2023			2024					
Phase I																														
Phase IIa																														
Scientific advice from FDA & EMA																														
Phase II/III in MS relapses (vs placebo)																														
Phase II/III in MS relapses (vs MP)																														
US NDA indication #1																														
EU MAA indication #1																														

Multiple Indications to Go (Pipeline)

	Indications to Develop	Market Potential Size	Competitors
1	Multiple Sclerosis (多發性硬化症)	>21.5B	Teva (2014) Biogen EMDSerono Novartis
2	Uveitis (葡萄膜炎) (眼睛發炎)	>0.531B	Humira (2016)
3	Neuropathic Pain (神經性疼痛)	>5.7B	Pfizer (2011)
4	Osteoarthritis (骨關節炎)	>5.335B	Anika (2014)
5	ALS (漸凍人-肌萎縮性脊髓側索硬化症)	>25M (a negative CAGR of 16.10%)	Biogen Idec Inc. Avanir Pharmaceuticals Inc. Isis Pharmaceuticals Inc. Sanofi Bristol-Meyers Squibb Co.
6	Mucopolysaccharidoses (MPS, 黏多醣症)	>300M	Vimizim
7	Metachromatic leukodystrophy (MLD, 異染性腦白質失養症)	1B	Shire Plc Nuo Therapeutics GlaxoSmithKline Plc Zymenex A/S RegenxBio Inc. Novartis AG

Unit: USD/Billion

ENX-201 Management Team



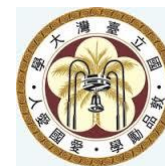
Yu-Fang Hu



Pieter J. Gaillard



Yuan-Yi Chou



ENX-201 Scientific Advisory Board

蔡清標
Taipei, Taiwan



THE UNIVERSITY OF SYDNEY



臺北榮民總醫院
Taipei Veterans General Hospital



台灣神經學學會
Taiwan Neurological Society

Olaf Stuve
(Texas, USA)



UT Southwestern
Medical Center



U.S. Department
of Veterans Affairs

Ralf Linker
(Erlangen, Germany)



UNI
FREIBURG

UKRUB

UNIVERSITÄTSKLINIKUM DER
RUHR-UNIVERSITÄT BOCHUM

Frederik Barkhof
(Amsterdam, Netherlands)



UCL



VU University
Medical Center
Amsterdam

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Manufacture Facilities

Successful Product Categories

In Progress Status

Biotech Success

Manufacture Facilities

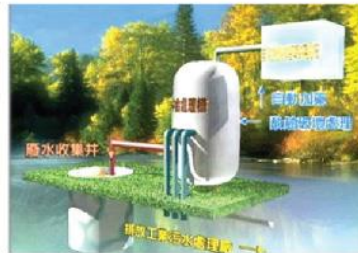
- The only PIC/S GMP certified manufacture sites for high potency oncology, we passed the following official inspections such as
 - EMEA by Hungary, Arabian, Jordan, Germany, Brazil, Japan.
 - USA FDA, Japan, EMA by Belgium, Turkey, Korea and Kazakhstan.
- High standard Validation of
 - Equipment qualification/ Laboratory instruments qualification/ HVAC system/ Water system/ Compressed air system/ Nitrogen system/ Cleaning/ Analytical method/ Process/ Computer/ Logistic
- Individual flow management
 - Air flow/ Man flow/ Material flow/ Product flow/ Waste flow
 - To prevent cross contamination and environmental pollution



HVAC System



Work Safety



Environmental Protection



Chungli Factory



Lioudu Factory



- Comply with PIC/S GMP and Taiwan FDA inspection for **non-cytotoxic or non-hormone**



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Biotech Success

Oncology/Successful Products for Global

TTY has successfully registered **47** oncology product licenses in **10** countries.

Country	UFur	Oxalip	Lipo-Dox	Irino	Asadin	Gemmis	Tynen	Epicin	Thado	Anazo	Folina	Sulfin	Algycon	Colimycin	Maxtam	Total
Thailand	1	1	1	1	1				1		1	1	1	1	1	11
Philippines			1	1	1			1		1		1	1			7
Vietnam	1	1	1		1	1	2		1							7
Hong Kong	1	1		1		2	2	3								10
Malaysia	1		1		1		1		1		1					6
Singapore				1												1
India	1															1
Sri Lanka										1						1
Guatemala			1													1
Colombia			1													1
Total	5	3	5	6	4	2	5	4	3	2	2	2	2	1	1	47

TTY's CMO partner holds the licenses of TTY brand drug- Doxil in US and Caelyx in EU.
 國際代工合作廠商擁有Lipo-Dox在美國(Doxil)及歐洲(Caelyx)之藥證。

Successful Oncology Products

Asadin
(伸定注射劑)



TS-1
(愛斯萬膠囊)



Epicin
(益彼欣注射液)



Tynen
(汰能注射劑)



Anazo
(安納柔膜衣錠)



Gemmis
(建仕注射劑)



Zobonic
(抑骨凍晶靜脈注射劑)



Ivic
(癌微可膜衣錠)



UFUR
(友復膠囊)



Pexeda Inj.
(派癌休注射劑)



Lipo-Dox
(力得微脂體注射劑)



Painkyl
(平舒疼口頰溶片)



Oxalip
(歐力普注射劑)



Thado
(賽得膠囊)



Irino
(益立諾)



Lonsurf
(朗斯弗膜衣錠)



Megest
(麥格斯口服懸液劑)



Otril
(嘔速停靜脈注射劑)



Folina
(芙琳亞錠)



Successful Products of Intensive Care

Brosym C+S
(博益欣)



Lipo-AB
(立博黴)



Colimycin
(克痢黴素注射劑)



Cubicin
(救必辛注射劑)



Flusine
(弗路欣錠)



Exacin
(依克沙)



Maxtam
(抑西每靈注射劑)



Agrippal
(安爾保流感疫苗)



Successful Healthcare Products

Algitab
(艾胃逆服)



Cepiro
(希比洛靜脈乾粉注射劑)



Alginos
(胃逆舒)



METACIN
(西腹黴素注射劑)



BIO-CAL PLUS
(滋骨咀嚼錠)



Sulfin
(速復利錠)



R&D Investment 研究及臨床

Subject \ Year	2013	2014	2015	2016	2017
Revenue (NTD,000)	2,307,540	2,384,220	2,738,956	3,344,262	3,672,040
R&D Expense (NTD,000)	289,530	283,470	236,398	230,192	219,126
Total Staff	484	494	450	508	520
R&D Manpower	111	105	97	105	98
R&D Expense/ Revenue	12.55%	11.89%	8.63%	6.88%	5.97%
R&D Total Staff	22.93%	21.26%	21.56%	20.67%	18.85%

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Financial Disclosure

Financial Performance (Parent Company Only)

NTD in Thousands

Item	2013		2014		2015		2016		2017	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
Net Sales	2,292,163	100%	2,384,207	100%	2,738,956	100%	3,344,262	100%	3,672,040	100%
Gross Profit	1,404,003	61%	1,411,875	59%	1,777,941	65%	2,217,286	66%	2,347,809	64%
Operating Expenses	-1,121,548	-49%	-1,144,400	-48%	-1,035,412	-38%	-1,063,104	-32%	-1,135,595	-31%
Operating Profit	282,455	12%	267,475	11%	742,529	27%	1,154,182	34%	1,212,214	33%
Non-Operating Income and Expenses	413,685	18%	596,585	25%	705,211	26%	277,855	9%	351,484	10%
Income before Tax	696,140	30%	864,060	36%	1,447,740	53%	1,432,037	43%	1,563,698	43%
Net Income	587,440	26%	779,645	33%	1,211,018	44%	1,193,324	36%	1,344,731	37%
EPS	2.52		3.14		4.87		4.80		5.41	

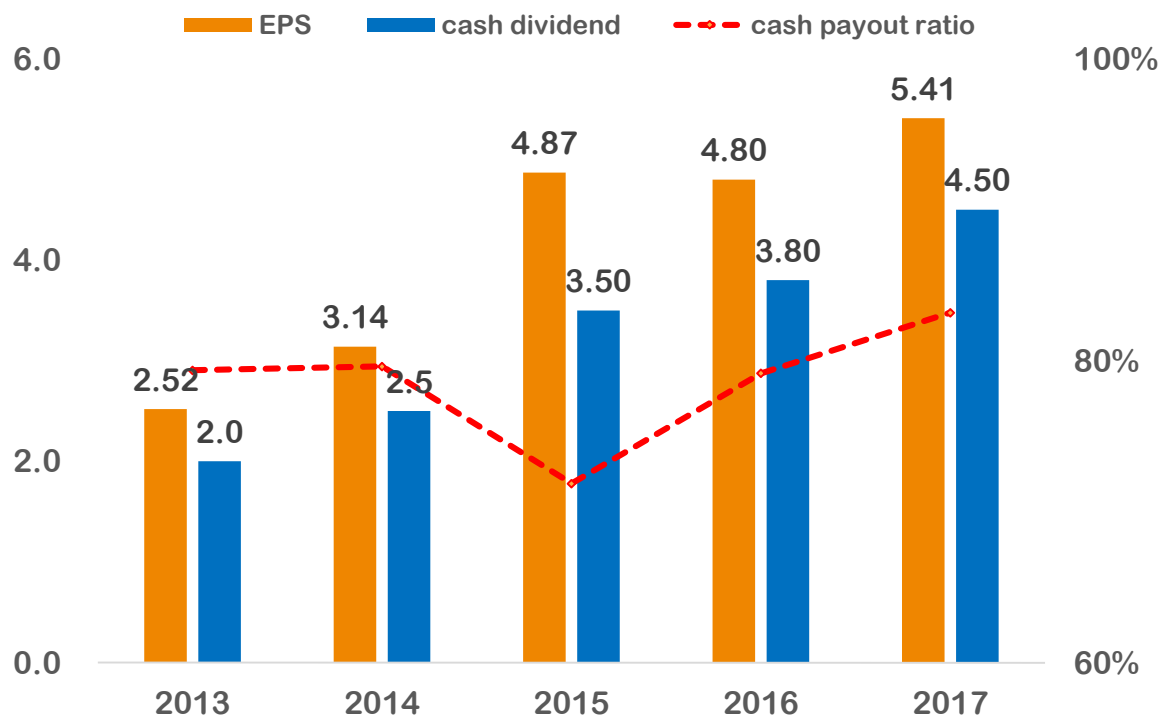
Financial Performance (Consolidated)

NTD in Thousands

Item	2015		2016		2017		Q1~Q3/2018	
	Amount	%	Amount	%	Amount	%	Amount	%
Net Sales	3,195,218	100%	3,760,717	100%	4,078,760	100%	2,944,610	100%
Gross Profit	2,183,144	68%	2,559,220	68%	2,668,845	65%	1,941,660	66%
Operating Expenses	-1,393,357	-44%	-1,379,533	-36%	-1,411,855	34%	1,188,427	41%
Operating Profit	789,787	24%	1,179,687	32%	1,256,990	31%	753,233	25%
Non-Operating Income and Expenses	735,808	23%	332,372	8%	338,077	8%	562,465	19%
Income before Tax	1,525,595	47%	1,512,059	40%	1,595,067	39%	1,315,698	44%
Net Income (Consolidated)	1,246,592	38%	1,254,724	33%	1,368,314	33%	1,098,712	37%
Net Income (TTY)	1,211,018	37%	1,193,324	31%	1,344,731	32%	1,144,112	39%
EPS	4.87		4.80		5.41		4.40	

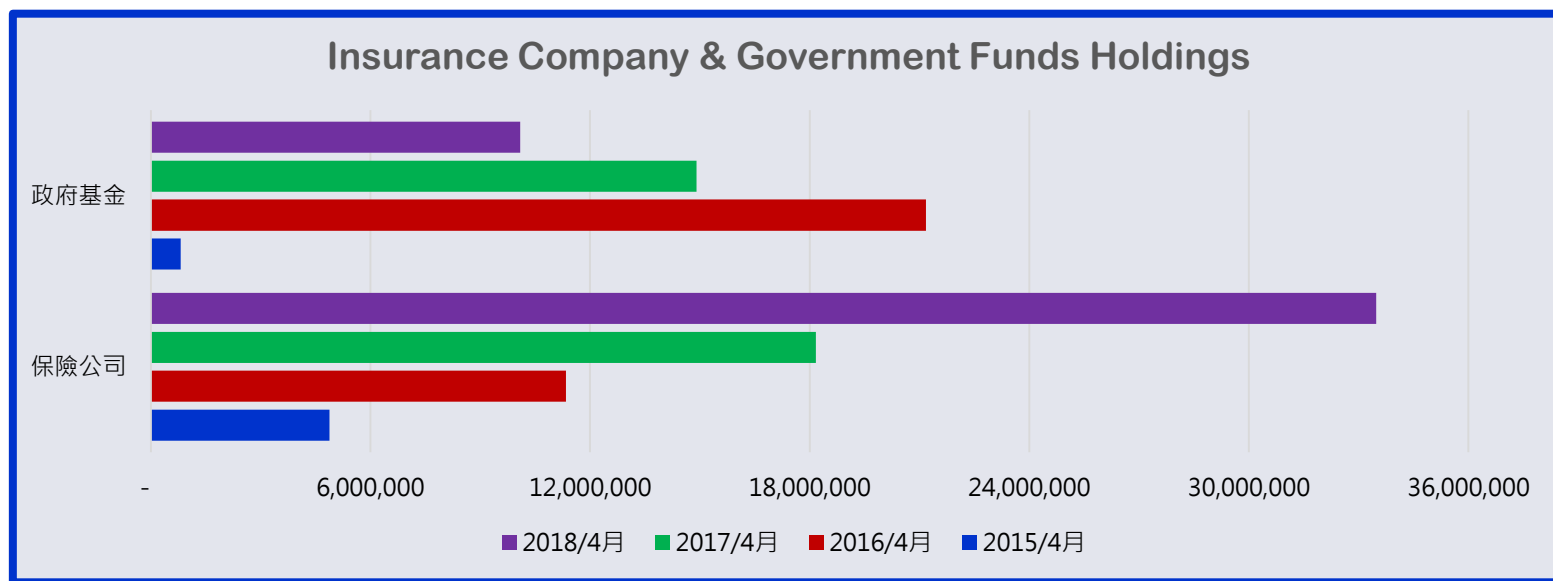
Dividend Payout

Item \ Year	2013	2014	2015	2016	2017
Cash Payout Ratio	79.4%	79.6%	71.9%	79.2%	83.2%
Total Dividend	2.67	2.50	3.50	3.80	4.50



Gov't Funds & Ins. Co.'s Holdings

Holdings Institution	April/2015		April/2016		April/2017		April/2018	
	Shares	Holdings (%)	Shares	Holdings (%)	Shares	Holdings (%)	Shares	Holdings (%)
Insurance Company	4,880,800	1.96%	11,339,000	4.56%	18,169,000	7.31%	33,474,000	13.46%
Government Funds	817,021	0.33%	21,177,843	8.52%	14,904,000	5.99%	10,088,843	4.06%
Total	5,697,821	2.29%	32,516,843	13.08%	33,073,000	13.30%	43,562,843	17.52%





Let's share and grow together
in this big family



東生華製藥
tsh biopharm



PharmaEngine

智擎生技製藥股份有限公司

