Acceleration of Biopharma Partnering Activity into China

Evolving Marketplace Favorable to Drug Development and Western Partners

December 2019

TORREYA

Table of Contents

Preface & Executive Summary

Preface

We at Torreya are engaged in providing strategic advice to companies in the life sciences industry. Torreya has a four person team covering Chinese pharmaceutical companies that is in China at least six times a year. We also maintain a database of deals in the China market to analyze trends.

This report may provide you with:

- An update on recent market and regulatory policy changes in China that further fuel the demand for innovative products in China and in-licensing activities
- Highlight of new rare disease policies that could address high unmet needs in China
- An analysis of the trends in both in-licensing and out-licensing activities, and typical deal structures and terms

Please contact the below members of the Torreya China team if you have any questions or comments.

Jie Liu
Managing Director, China Lead
Jie.liu@torreya.com
Cell: 917.683.4003

Jocelyn Lyu
Analyst, China Lead
Jocelyn.lyu@torreya.com
Cell: 917. 971.6415

Executive Summary

1. The China pharma market is expected to be the second largest with further growth of 230%[1] by 2030

- Favorable government regulatory policies and increasing VC financing
- New public listings in Hong Kong and Shanghai for pre-revenue companies giving more
  - Hong Kong Stock Exchange (HKEX) remains attractive to high quality biotech companies
  - Shanghai Science and Technology Innovation Board (STAR Market) was launched on July 22 to list pre-revenue biotech companies, giving more opportunities for strong biotech companies

2. Cross-border transactions to China have been growing rapidly in recent years

- Outbound overseas M&A and investment are down due to geopolitical reasons (CFIUS and trade war) but inbound licensing has increased and accounts for over 75% of total deals in 2018
- Interestingly, licensing deals are not blocked by CFIUS and have been unaffected by the trade war
- 2019 has seen large transactions and more diverse structures in China related transactions:
  - Everest Medicines, backed up C-Bridge Capital paid $835 million for China rights to an antibody-drug conjugate from Immunomedics, with $65M upfront, the largest in licensing history in China
  - Cytovant paid a $1 billion package for China rights to four T-Cell immunotherapies from Medigene
  - Amgen paid $2.7B for a 20.5% stake in BeiGene (25% stock premium) to develop oncology drugs in China
  - Astra Zeneca launched $1B China investment fund with Chinese investment bank CICC

3. We believe that in-licensing is expected to dominate in cross border transactions in the next 3-5 years

- Recognition of need for R&D and using licensing to fill gap
- VCs and emerging biotech companies provide significant market/appetite for late-stage assets from US / Europe
- Change in regulatory environment might accelerate drug development and approval

4. Torreya has expertise in facilitating China deals

- Most active financial advisor by far on China transactions in the last 24 months
- Five person team supports inbound and outbound licensing, M&A and JV work

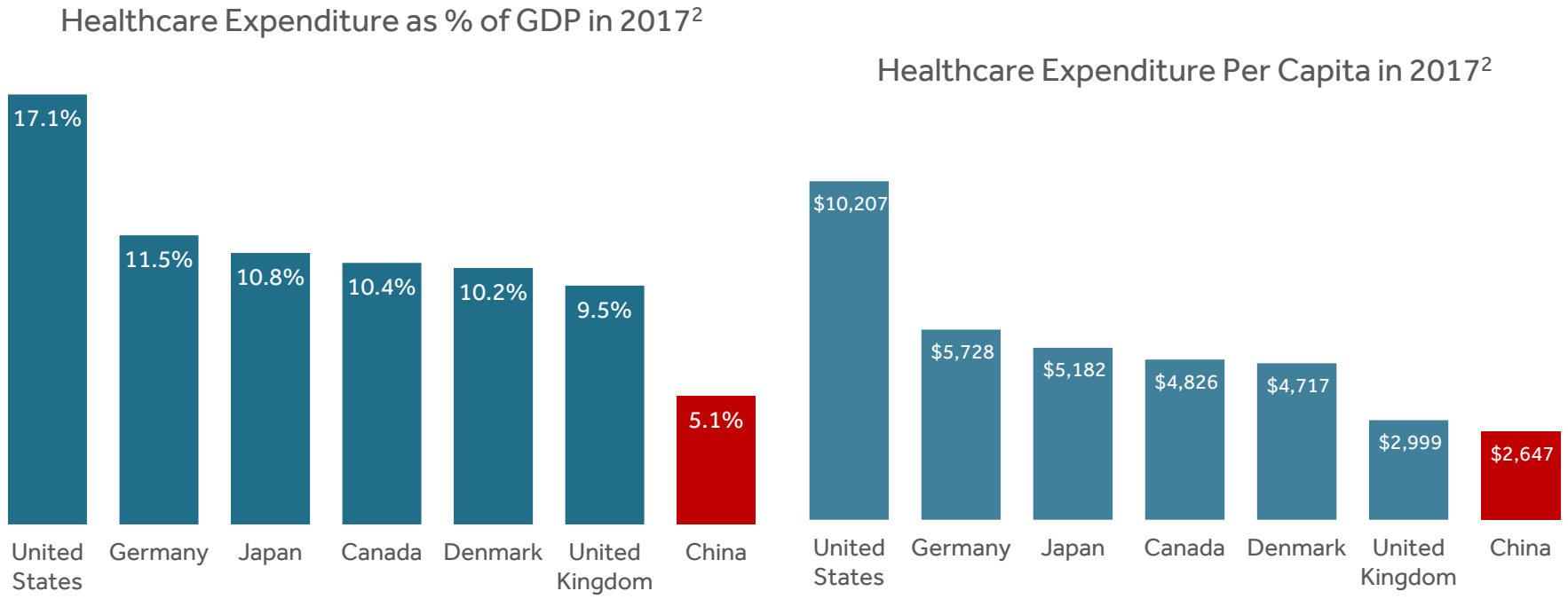
[1] Source: Torreya forecast based on OECD GDP projections and historical relationship between country GDP growth and pharmaceutical consumption.

China Market and Recent Changes

China is the second largest healthcare market in the world.

China's healthcare spending per capita and relative to GDP is still low compared to other nations and indicates significant room for growth potential.

- The healthcare market in China is growing at a staggering rate due to factors such as the aging population, rapid urbanization, growing domestic and international investment in research and development, and robust government support
- China's healthcare industry is projected to be around $2.4 trillion by 2030[1]



[1]China Daily, "China's health service industry to reach 16 trillion yuan by 2030," Aug 15, 2017
[2]OECD (2019), Health Spending. Data retrieved on 07/01/2019.

China Projected to Have the Highest Healthcare Growth Spend

Pharmaceutical Sector Growth Forecast

Size of Pharmaceutical Sector in the Future vs. Today[1]

Country	2030 vs. 2017	2060 vs. 2017
World	160%	317%
USA	134%	243%
China	**230%**	**454%**
Japan	117%	177%
Germany	118%	159%
France	129%	196%
United Kingdom	128%	245%
Australia	149%	286%
Canada	131%	259%

Source: Looking to 2060: Long-Term Global Growth Prospects, OECD 2012

Significant issues lie behind growth of China Pharma Market, resulting in recent government policy changes

Positive for innovative drug companies

- China's health insurance funds have been running in deficit since 2011. Government subsidies have been supporting the funds, accounting a quarter of the fund's total revenues in 2018
- Soaring healthcare costs with high prices of drugs that have gone off patent:
  - US generic drug prices on average are 55% of those in China, according to a recent Credit Suisse Group AG report
  - Chinese generic companies historically enjoy 80-90% gross margin for selling generics with large sales force
- Until recently, drug approval process in China was complex and tedious, blocking many new medicines from getting in:
  - CFDA stated fewer than a third of the 433 new treatments approved in developed countries reached China between 2001 and 2016
  - China patients lagging behind in accessing the newest drugs, as long as 7 years
- Recent changes in favorable regulatory policies and national drug bidding process might accelerate development and approval of innovative medicines:
  - ICH membership
  - MAH (Marketing Authorization Holding)
  - Streamlining of the Clinical Trial Approval (CTA) process
  - Shortened Timeline for Imported Drug License
  - Expedited Orphan Drug Review Process
  - 4+7 bidding with guaranteed market share to significantly decrease generic drug pricing and at the same time, to shift spending to pay for new innovative drugs and orphan drugs

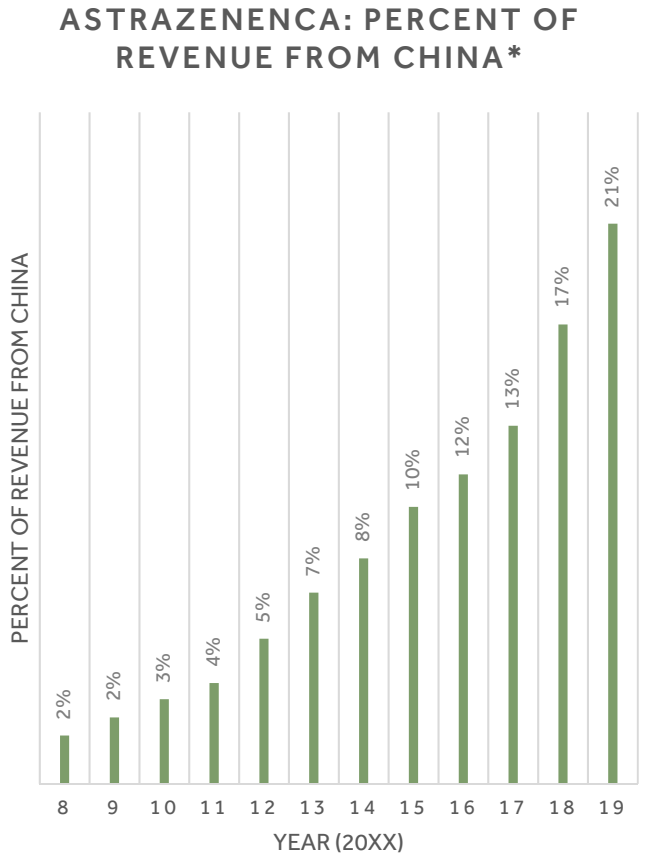
Sources: Chinese Ministry of Finance, Nomura Research, Bloomberg

Big Pharma Interest in China is Rising

Larger Pharma Companies are Beginning to Pay More Attention to the China Market

- Certain large pharma companies have always had a meaningful presence in the China market:
  - These companies include AstraZeneca, Bayer, Novartis and Pfizer
- Due to the high growth and sheer size of the market, we are starting to see a variety of approaches emerge to facilitate increased exposure to the market.
- Examples include:
  - Amgen's acquisition of a 25% stake in BeiGene and cross license of rights to oncology products into China.
  - AstraZeneca's decision to open a $1 billion fund to invest in Chinese start up. It's not a surprise as 21% of all AZ revenue comes from China today (over $5 billion in 2019). China is one of AZ's main areas for growth.
  - Pfizer's decision to merge its legacy brands and generics (Upjohn) into Mylan and to relocate this company to China. The new company has renamed itself as Viatris, moved its executive team to Shanghai and has indicated that its plans include "building a meaningful presence in China".
- To be fair, big pharma interest in China remains fairly nascent. Only four of the top fifteen pharmas break out China revenue at all. For those that do, China accounts for less than 10% of total revenue in total.

AstraZeneca



* Notes and Source: AstraZeneca annual reports, 2008 to 2018 and Quarterly financials for 2019. Q4 2019 results are forecast using the trend from previous quarters.

Big Pharma Structured Entry into the China Market

Amgen and BeiGene Deal on Oct. 31, 2019

Amgen Enters Into Strategic Collaboration With BeiGene To Expand Oncology Presence In China

- Amgen to significantly accelerate its plans to expand its oncology presence in China
- Amgen to acquire 20.5% stake in BeiGene for approximately $2.7 Billion in cash
  - At 36% premium to BeiGene's 30-day volume-weighted average share price as of Oct. 30, 2019
  - Amgen will nominate one person to serve on BeiGene's Board of Directors
- BeiGene to commercialize XGEVA® (denosumab), KYPROLIS® (carfilzomib) and BLINCYTO® (blinatumomab) in China
  - XGEVA was launched in China in 9/2019; KYPROLIS and BLINCYTO are in Phase 3 trials in China
  - Both parties will equally profit and loss during the initial 5 years
  - Two of the three products will revert back to Amgen, 1st product after 5 years and 2nd product after 7 years
- Amgen and BeiGene will collaborate on Amgen's 20 oncology drugs in China and globally
  - BeiGene will share global R&D costs and contribute up to $1.25 billion to advance these medicines
  - Amgen will pay royalties to BeiGene on the sales of these products outside of China, with the exception of AMG 510, Amgen's first-in-class $KRAS^{G12C}$ inhibitor
  - BeiGene will assume commercial rights in China for seven years after launch for those that receive approval in China, including AMG 510
    - After this time, BeiGene will retain rights to up to six of these products in China, excluding AMG 510, while rights on remaining products revert to Amgen
    - Amgen and BeiGene will share profits in China equally on these products until the rights revert to Amgen, after which Amgen will pay royalties to BeiGene on sales in China for a period of five years after reversion
- Amgen will continue to commercialize its non-oncology product portfolio in China

AMGEN

BeiGene

Details of the collaboration are in a press release at:

https://www.prnewswire.com/news-releases/amgen-enters-into-strategic-collaboration-with-beigene-to-expand-oncology-presence-in-china-300949421.html

Reimbursement Policy Changes

Recent changes to the reimbursement policy in China are helping to drive innovation

- The national reimbursement drug list (NRDL) and the essential drug list (EDL) intend to provide basic medical coverage to China's population of 1.4 billion, typically covering well-established and relatively cheap medicines[1]
  - Updates to the NDRL have often been significantly delayed. The list should have been updated every two years but there has been a significant lag
- Innovative medicines have historically faced a tremendous struggle to attain reimbursement in China
  - Overall coverage for innovative medicines has been very limited
  - Securing a place on the NDRL for innovative products has been a challenging issue for global pharmaceutical manufacturers
- Recent changes in national pricing and reimbursement policies are prepared to enhance patient access to innovative therapies
  - Regular updates to the NDRL
  - The rise of supplemental private health insurance

China's Recent Reimbursement Landscape shows that the NDRL updates in 2017 have increased the number of products reimbursed

Since 2013	• Some provinces began to pilot the negotiation mechanism in reimbursement • 2013 Jiangsu included 3 products • 2014 Zhejiang's first negotiation included 15 products for reimbursement
2015	• First national pilot in reimbursement negotiations for 3 products
March 2017	• New NDRL updates and 44 products entering negotiations • First NDRL update since 2009
June 2017	• 36 products agreed to gain national reimbursement
January 2018	• Zhejiang published the second list of provincial reimbursement negotiations for an additional 21 innovative medicines
October 2018	• Another 17 oncology products agreed to gain national reimbursement

Policy Initiatives That Influence Pricing and Reimbursement

Two-Invoice System for Drug Procurement – December 2016

- Structure where only up to two invoices are issued along the chain of pharmaceutical drug procurement, with one issued by the pharmaceutical manufacturer and the other issued by the distributor to the medical service providers
- Eliminates multiple layers of distributors and streamlines the procurement process to a large extent
- In addition to the layered supply chain, the complex distribution network and the lack of transparency have elevated pharmaceutical product prices
- The two-invoice system plans to establish a distribution environment where the prices of pharmaceutical products are feasible and affordable to the public

Healthy China 2030 – October 2016

- China officially passed the blueprint of "Healthy China 2030", working towards the national goal of obtaining a health standard on par with developed countries by 2030
- It is a significant move to enhance public health, which is also a response to the global commitments
- China is exploring methods to tackle rapid aging, growth of NCDs (non-communicable diseases), and inflation of health demand. It also plans to advance the reform of the medical insurance reimbursement methods
- There are still some considerable issues which includes the rationality of indices and the coverage of indices for certain heath-related issues

China is Reforming its Healthcare System in Order to Adapt to a Changing Economic and Demographic Situation

The New Generic Drug Volume-based Purchasing

- The 4+7 program, officially launched in November 2018, intends to improve patient-access to generics by centralizing drug procurement
  - The National Drug Centralized Procurement Pilot Scheme, commonly known as the 4+7 Scheme, intends to decrease the prices of generic drugs
  - The program encourages the consolidation of a fragmented system for procuring generic drugs in the country, beginning with 11 major cities*
- The program plans to bring a centralized system of quality control in the China pharmaceutical industry
  - The absence of such a system has permitted many local manufacturers to function in the market with low-quality versions of a drug and have made high profit margins that significantly exceeded the global average
  - Multinationals, which generally offer better, high quality drugs, were subject to excessive waiting periods in order to attain import licenses from the government
- In addition to improving affordability and quality assurance, the program also eliminates favoritism and corruption as manufacturers have used their regional influence to win local hospital tendering bids
  - The government might give the tender for a generic drug to the lowest bidder, who is assured a sale volume of 60-70% of the total market for a year across the 11 major cities
  - In September 2019, the generic drug tender program was expanded and is now called "4+N" and has expanded: "The scheme could be expanded to an additional 25 provinces and regions, who may form a league to look for suppliers for these drugs that could be stocked at public hospitals as well as some military and private medical institutions, according to documents released on Sunday by the drug procurement branch of the Shanghai Healthcare Security Administration." (Source: Reuters, Sep 2, 2019).
  - The program now covers 70% of the Chinese market

Recent Regulatory Policy Changes

China's New Regulatory Agencies and Responsibilities

- **National Medical Product Administration (NMPA)**
  - Formerly known as the China Food and Drug Administration (CFDA)
  - Responsible for issuing marketing authorizations of drugs and medical devices and supervising product quality
- **National Development & Reform Commission (NDRC)**
  - Responsible for setting the price of drugs and medical services
  - Develops and implements strategies of national economic and social development
- **National Health Commission (NHC)**
  - Responsible for the overall management of healthcare reform, administering China's Essential Drug List (EDL) and monitoring the drug tendering and procurement policies
  - Monitoring the operation of state-owned hospitals, drug registration and safety administration
- **The Ministry of Human Resources and Social Security (MOHRSS)**
  - The authority that is responsible for developing the National Drug Reimbursement List.
  - Manages the medical care programs and reimbursement system
- **Ministry of Commerce**
  - Regulates the distribution of medicines and medical equipment
- **Ministry of Finance**
  - Investments in healthcare sector and subsidies for health insurance

Amendments to the Drug Administration Law

- On 26 August 2019, the National People's Congress passed amendments to the Drug Administration Law which took effect on December 1st, 2019
- The Drug Administration Law reflects China's continuing commitment to the pharmaceutical industry as the provisions in the law addresses key issues, which are of great public concern
- Key new provisions include:
  - Implementing a nation-wide enhanced Drug Market Authorization Holder system. A market authorization is like an NDA in the US. It comes with both privileges (right to market a drug) and obligations (requirement to inform government of adverse events etc)
  - Drug innovation incentives. Bioequivalence needs to be recorded for generics. Priority review and accelerated approval pathways set up for pediatric drugs, rare disease drugs and drugs with urgent clinical needs
  - Rules for compassionate drug use
  - System by which drugs can be conditionally approved
- Some key areas with crackdowns:
  - Limitations on use of e-pharmacies
  - Definition of "inferior drugs" and "counterfeit drugs"
  - Fines and other potentially severe penalties for violations of the rules

Source and Note: Further details are at https://www.twobirds.com/en/news/articles/2019/global/china-passed-new-amendments-to-the-drug-administration-law

Implications of the Recent China Pharma Regulatory Changes

1. **The rapid growth of China's pharmaceutical market presents opportunities for global pharmaceutical companies**
   - Recent regulatory changes have allowed the implementation of future trials in China in tandem with the United States and Europe launches
   - This is beneficial to Chinese patients as they could receive required medications at a faster rate and global pharmaceutical companies may prosper in bringing the medications to the market
2. **Recent regulatory changes may lead to a decline in redundant clinical trials and less unnecessary risk for patients**
   - With its membership in the ICH, China now follows international GMP and GCP standards that are generally endorsed in the international pharmaceutical industry
   - Clinical data generated in China and overseas in ICH territories during drug development may be mutually approved across Chinese and international regulatory authorities
3. **The volume and pace of clinical trials is expected to increase dramatically.**
   - Chinese regulatory authorities have made changes that accelerate regulatory reviews, establish new and flexible policies for import of drugs into China, grant market exclusivity periods guaranteed for specific products, and make critical advancements to the approval process of clinical trials in China

New Policies on Rare Diseases and Pediatrics in China

TORREYA

Environment Increasingly Favorable for Rare Disease Drugs

- Historically China did not have specialized regulations or policies on orphan or rare disease drug development and approvals
  - Of the 44 globally available rare disease therapies, only 19 are currently marketed within China, and of these 19, all are priced out of reach for the average Chinese patient
  - China has an estimated population of nearly 20 million people suffering from a rare disease
- China started to issue regulation guidelines in early 2018 with the goal to accelerate the filing, approval and data exclusivity of rare disease products that were already on the market in the West
- The first official policy and list of 121 rare diseases were jointly issued by NHC / NMPA / MOST* on May 11, 2018
- Overseas data could be accepted for NDA submissions for these 121 drugs based on policy update on May 23 2018
  - 3 months review for rare diseases vs. 6 months for others
- Effective March 1, 2019, value-added tax for 21 orphan disease drugs is expected to drop to 16 percent from 3 percent, according to the announcement by China's State Council to stimulate rare disease market
- Additional 26 drugs were added on May 29, 2019 by CDE. These drugs were already approved outside of China and would receive expedited approval in China

*CDE: Center for Drug Evaluation, directly involved in the clinical trial application and drug registration approval process

*NHC: National Health Commission responsible for managing ethics committee nationwide, establishing the National Committee of Medical Ethics Experts, and for developing policies relating to ethical review

*NMPA: National Medical Product Administration is the regulatory authority responsible for clinical trial oversight, approval and inspections for drugs to be registered in China. Previously known as CFDA

*MOST: Ministry of Science and Technology

Impact and Considerations for Rare Disease Drug Registration in China

- China is still at infancy stage with its regulatory policies on rare diseases. We are expected to see significant improvement in regulatory policies and increase in drug approvals to address the unmet medical needs
- The current Chinese rare disease list gives priority to rare diseases with a relatively high prevalence in China, that pose a heavy burden, and that are highly treatable
- For companies with rare disease drugs that have been approved already outside of China we recommend consulting and interacting with CDE (Center for Drug Evaluation) as early as possible in order to reduce registration timeline in China
- For products still under development outside of China, under the current policy companies cannot submit for NDA approval.
  - To enter into China at the same time or earlier than US or European approval, we recommend finding a local Chinese partner and let the partner participate in global trials.
  - Under the Data Protection Regulation (still in Draft stage), if approved, the drug would enjoy 12 year data exclusivity in China

List of 121 Chinese Rare Diseases

No.	Disease
1	21-Hydroxyulase Deficiency
2	Albinism
3	Alport Syndrome
4	Amyotrophic Lateral Sclerosis
5	Angleman Syndrome
6	Arginase Deficiency
7	Asphyxiating Thoracic Dystrophy (Jeune Syndrome)
8	Atypical Hemolytic Uremic Syndrome
9	Autoimmune Encephalitis
10	Autoimmune Hypophysitis
11	Autoimmune Insulin Receptopathy (Type B insulin Resistance)
12	Beta-ketothiolase Deficiency
13	Biotinidase Deficiency
14	Cardic Ion Channelopathies
15	Carnitine Deficiency
16	Castleman Disease
17	Charcot-Marie-Tooth Disease
18	Citrullinemia
19	Congenital Adrenal Hypoplasia
20	Congenital Hyperinsulinemic Hypoglycemia
21	Congenital Myasthenic Syndrome
22	Congenital Myotonia Syndrome (Non-Dystrophic Myotonia, NDM)
23	Congenital Scoliosis
24	Coronary Artery Ectasia
25	Diamond-Blackfan Anemia
26	Erdheim-Chester Disease
27	Fabry Disease
28	Familial Mediterranean Fever
29	Fanconi Anemia
30	Galactosemia

No.	Disease
31	Gaucher's Disease
32	General Myathenic Gravis
33	Gitelman Syndrome
34	Glutaric Acidemia Type 1
35	Glycogen Storage Disease (Type I, II)
36	Hemophilia
37	Hepatolenticular Degeneration (Wilson Disease)
38	Hereditary Angioedema (HAE)
39	Hereditary Epidermolysis Bullosa
40	Hereditary Fructose Intolerance
41	Hereditary Hypomagnesemia
42	Hereditary Multi-infarct Dementia (Cerebral Autosomal Dominant Arteriopathy with Subcortical Infarcts and Leukoencephalopathy, CADASIL)
43	Hereditary Spastic Paraplegia
44	Holocarboxylase Synthetase Deficiency
45	Homocysteinemia
46	Homozygous Hypercholesterolemia
47	Huntington Disease
48	Hyperornithinaemia-Hyperammonaemia-Hhomocit rullinuria Syndrome
49	Hyperphenylalanimemia
50	Hypophosphatasia
51	Hypophosphatemic Rickets
52	Idiopathic Cardiomyopathy
53	Idiopathic Hypogonadotropic Hypogonadism
54	Idiopathic Pulmonary Arterial Hypertension
55	Idiopathic Pulmonary Fibrosis
56	IgG4 related Disease
57	Inborn Errors of Bile Acid Synthesis
58	Isovaleric Acidemia
59	Kallman Syndrome
60	Langerhans Cell Histiocytosis

List of 121 Chinese Rare Diseases

No.	Disease
61	Laron Syndrome
62	Leber Hereditary Optic Neuropathy
63	Long Chain 3-hydroxyacyl-CoA Dehydrogenase Deficiency
64	Lymphangioleiomyomatosis (LAM)
65	Lysine Urinary Protein Intolerance
66	Lysosomal Acide Lipase Deficiency
67	Maple Syrup Urine Disease
68	Marfan Syndrome
69	McCune-Albright Syndrome
70	Medium Chain Acyl-CoA Dehydrogenase Deficiency
71	Methylamalonic Academia
72	Mitochodrial Encephalomyopathy
73	Mucopolysaccharisdosis
74	Multi-Focal Motor Neurothy
75	Multiple Acyl-CoA Dehydrogenase Deficiency
76	Multiple Sclerosis
77	Multiple System Atrophy
78	Myotonic Dystrophy
79	NAGS Deficiency
80	Neonatal Diabetes Mellitus
81	Neuromyelitis Optica
82	Niemann-Pick Disease
83	Non-Syndromic Deafness
84	Noonan Syndrome
85	Ornithine Transcarbamylase Deficiency
86	Osteogenesis Imperfecta (Brittle Bone Disease)
87	Parkinson Disease (Young-onset , Early-onset)
88	Paroxysmal Nocturnal Hemoglobinuia
89	Peutz-Jeghers Syndrome
90	Phenylketouria

No.	Disease
91	POEMS Syndrome
92	Porphyria
93	Prader-Willi Syndrome
94	Primary Combined Immune Deficiency
95	Primary Hereditary Dystonia
96	Primary Light Chain Amyloidosis
97	Progressive Familial Intrahepatic Cholestasis
98	Progressive Muscular Dystrophies
99	Propionic Acidemia
100	Pulmonary Alveolar Proteinosis
101	Pulmonary Cystic Fibrosis
102	Retinitis Pigmentosa
103	Retinoblastoma
104	Severe Congenital Neuropenia
105	Severe Myoclonic Epilepsy In Infancy (Dravet Syndrome)
106	Sickle Cell Disease
107	Silver-Russell Syndrome
108	Sitosterolemia
109	Spinal and Bulbar Muscular Atrophy (Kennedy Disease)
110	Spinal Muscular Atrophy
111	Spinocerebellar Ataxia
112	Systemic Sclerosis
113	Tetrahydrobiopterin Deficiency
114	Tuberous Sclerosis Complex
115	Tyrosinemia
116	Very Long Chain Acyl-CoA Dehydrogenase Deficiency
117	Williams Syndrome
118	Wiskott-Alrich Syndrome
119	X-linked Agammaglobulinemia
120	X-linked Ldrenoleuko Dystrophy
121	X-linked Lymphoproliferative Disease

China's Pediatric Drug Market Attractive to Innovators

Current Chinese Pediatric Market– July 2019

- Large market, but few pediatric drugs
- Estimated 260 million children population by year 2020
- China pediatrics dosage form compared to existing dosage forms is 1:59
    - 90% of drugs do not have doses suitable for children
- Volume and pace of clinical trials in China are expected to pick up precipitously In the coming years
- Only a few companies focus on development and commercialization of pediatrics in China
- Widespread use of adult drugs in children that results in significant adverse events in children

Challenges– July 2019

- High cost and risk for R&D on pediatric drugs
    - High incidence of deadly events due to overdosing
- Manufacturers are unwilling to produce due to low profit

Chinese Regulations – July 2019

- Under recent regulatory changes, NMDA is considering favorable regulations to speed up development and approval of pediatric drugs
- Additionally, NMPA (previously China FDA) implementing priority reviews of certain drugs to facilitate faster patient access, pediatrics included
- Pending regulations: Conditional Approval by using foreign data and providing 10 years of data exclusivity for NCEs and 3 years for reformulations

Source: Beijing Pediatric Research Institute, July 2019.

Cross-Border Licensing and M&A Activity

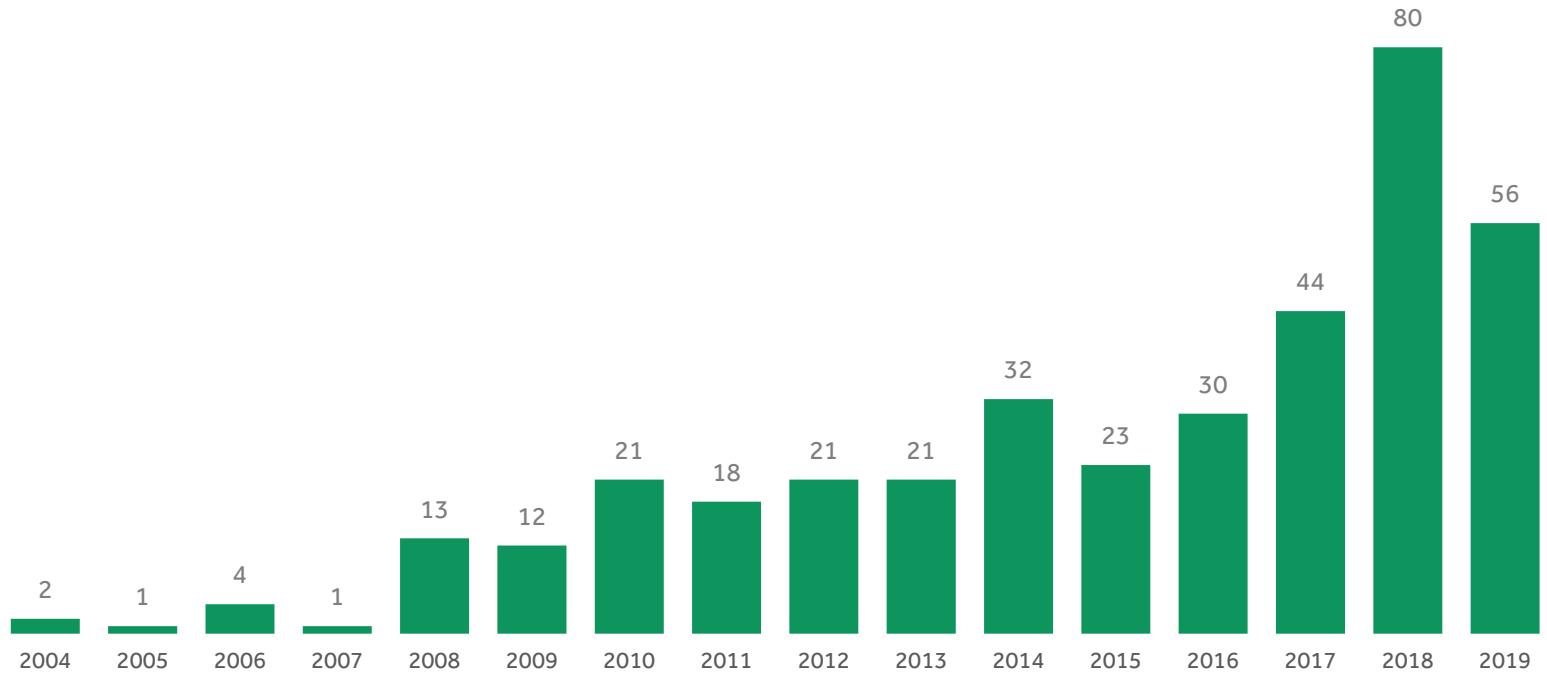
TORREYA

Overview

- China pharma market has continued its growth as 2nd largest global player due to favorable government regulatory policies, increasing VC financing, new public listings in Hong Kong and Shanghai for pre-revenue companies
- IPO market remains strong in China and Hong Kong
  - Hong Kong Stock Exchange (HKEX) remains attractive to high quality biotech companies
  - Shanghai Technology and Innovation Board (STAR started recently with success for the initially listed companies
- Cross-border transactions have been growing rapidly in recent years
  - Mainly for in-licensing to China, accounting for 75% of total deals in 2018
  - M&A and out-licensing from China are minimal
- 2019 has seen large transactions and more diverse structures in China related transactions:
  - Everest Medicines, backed up C-Bridge Capital paid $835 million for China rights to an antibody-drug conjugate from Immunomedics, with $65M upfront, the largest in licensing history in China
  - Cytovant paid a $1 billion package for China rights to four T-Cell immunotherapies from Medigene
  - Amgen paid $2.7B for a 20.5% stake in BeiGene (25% stock premium) to develop oncology drugs in China
  - Astra Zeneca launched $1B China investment fund with Chinese investment bank CICC
- Overseas M&A and investment have been slowing down due to geopolitical reasons (CFIUS, trade dispute)
- In-licensing is projected to dominate in cross border transactions in the next 3-5 years
  - Recognition of need for R&D and using licensing to fill gap
  - VCs and emerging biotech companies provide significant market/appetite for late-stage assets from US / Europe

China In-Licensing Deal Activity Peaked in 2018

Number of In-Licensing Deals for China Rights, 2004-2019 (annualized as of 11/22/2019)



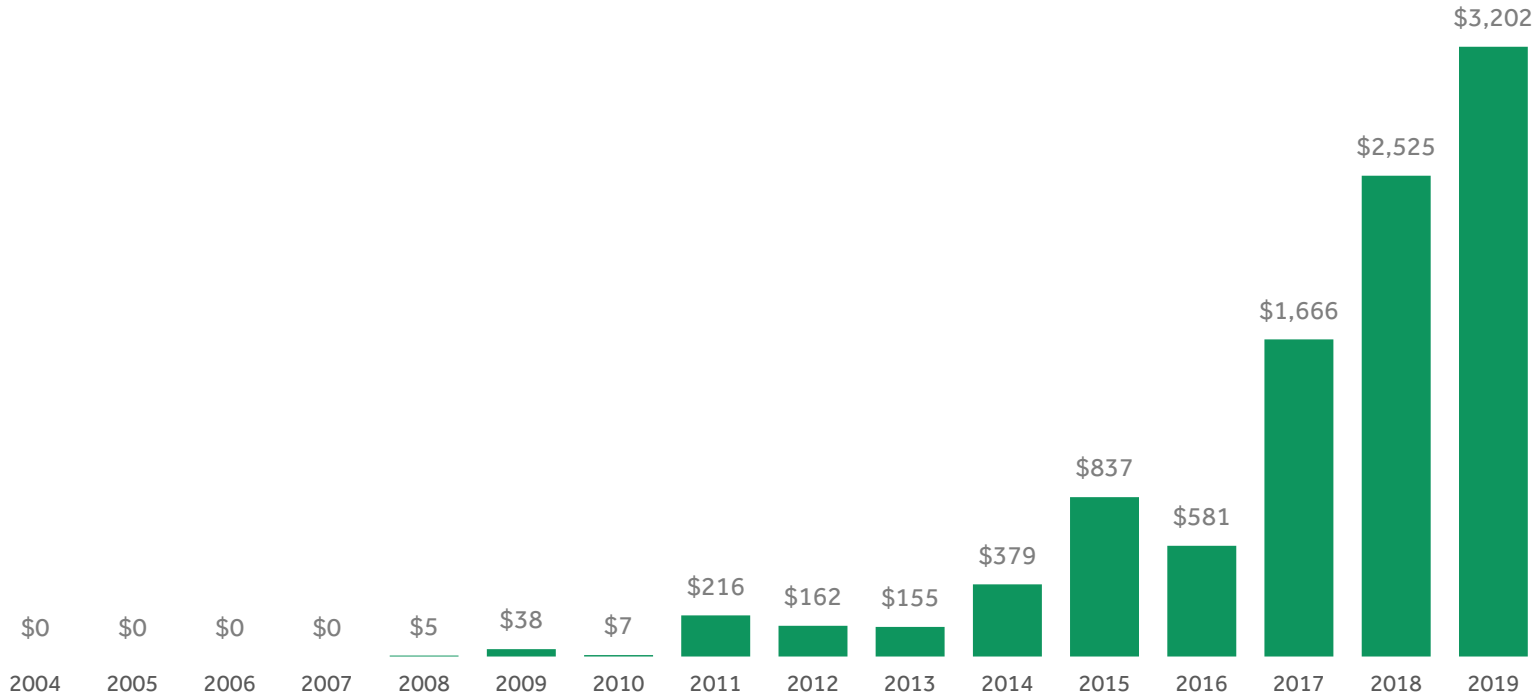
Key factors behind the jump in licensing activity in 2018:

1. Encouragement of licensing over M&A following the 19th Party Congress
2. Strong stock market valuations of companies that are licensing in many Western drugs
3. Drop in activity in 2019 versus huge boom year in 2018 (but 2019 still the second strongest year in history)

Source: Torreya China Deal Database, November 2019.

Dollar Volume of Investment and Upfronts in China Licensing Deals

Volume of Upfronts, Milestones and Investment in China Deals, 2004-2019 ($mm)



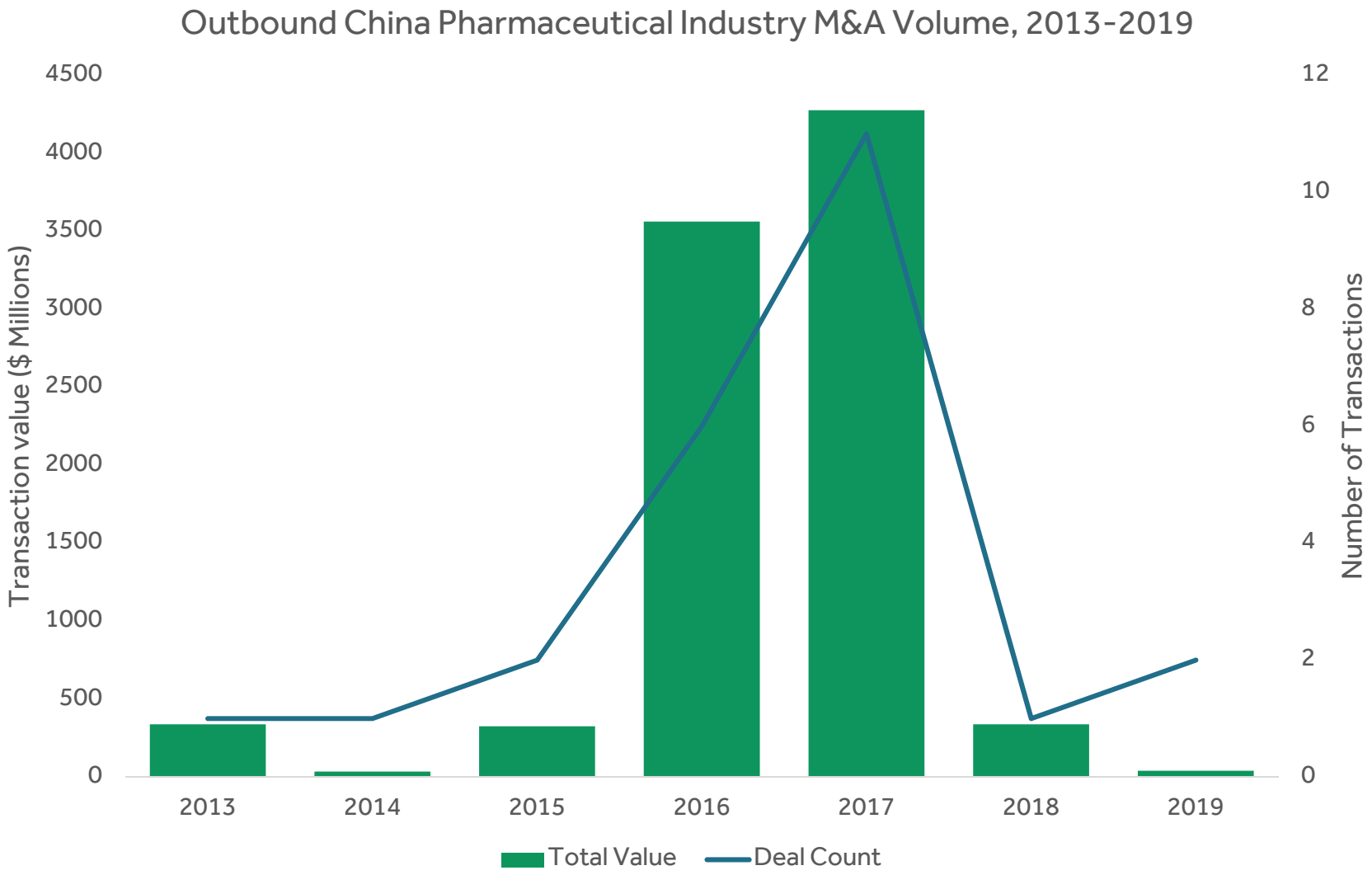
Key factors behind the jump in funds committed in recent years.

1. Encouragement of licensing over M&A following the 19th Party Congress
2. BeiGene / Amgen deal a key driver for 2019

*Data for 2019 shown from Jan 1 to November 22, 2019 and annualized.

Source: Torreya China Deal Database, November 2019.

China Outbound M&A Volume Still Low Due to CFIUS and Currency Restrictions



Source: Torreya China Deal Database, November 2019.

China Outbound M&A Deals in Pharma Sector

Date	Year	Buyer	Target	Asset	Target Country	Value ($mm)
Dec-13	2013	Hepalink	SPL	Heparin manufacturing	United States	338
Dec-14	2014	Sunshine Pharma	Sirton Pharma	Acquisition of drug company	Italy	35
May-15	2015	Consortium	Ambrx	US antibody platform	United States	118
Aug-15	2015	Hepalink	Cytovance	Heparin manufacturing	United States	207
Mar-16	2016	Humanwell	Epic Pharma	U.S. Generic Platform	United States	550
May-16	2016	Creat Group	BPL	British Blood Products	UK	1200
Jul-16	2016	Fosun Pharma	Gland Pharma	Global Injectable Generic Platform	India	1300
Jul-16	2016	Luye Pharma	Acino Plant	Transdermal Generics	Switzerland	300
Sep-16	2016	Jiangsu Nhwa	Mapi	API manufacturing	Israel	200
Oct-16	2016	Kelun Pharma	Klus Pharma	Acquisition of Cancer drug	United States	12
Jan-17	2017	Sanpower	Dendreon	Cancer cell therapy business	United States	820
Mar-17	2017	Tiancheng Intl	Biotest	Blood products platform	Germany	1293
Jun-17	2017	Humanwell	Rite Dose	Unit dose generic platform	United States	605
Jun-17	2017	Xianju Pharma	Newchem	Steroid API manufacturer	Italy	125.4
Jul-17	2017	Haitong	Obagi	Dermatology direct sales	United States	190
Aug-17	2017	Fosun Pharma	Sandoz	ANDA Bundle	United States	18
Aug-17	2017	GL Capital	SciClone	Cancer drugs for China	United States	605
Sep-17	2017	Betta Pharma	Equinox Science	Oncology biotech	United States	20
Sep-17	2017	3SBio	Therapure	Biologics CDMO Business	Canada	300
Nov-17	2017	Lee's Pharma	Windtree	Acquisition of interest in respiratory	United States	10
Dec-17	2017	NKY Pharma	Biovision	Drug screening specialist	United States	290
May-18	2018	YiFan Pharma	SciGen Ltd	Biosimilars Business	Australia	28
May-18	2018	Luye Pharma	AZ Seroquel	Depression Drug	UK	538
Jul-18	2018	Tasly	Transgene	Acquisition of JV in cancer	France	48
Jul-18	2018	China Grand	Sinclair Pharma	Acquisition of aesthetic Derm	UK	244
Jun-19	2019	Shandong Sito	Lisa Pharma	Injectable Generics	Italy	10
Oct-19	2019	China Grand	Oncosec	Oncology biotech	United States	30

Typical Deal Structures

TORREYA

Doing a China Licensing Deal

Historically, the time to complete an outlicensing China deal for Torreya (from start to finish) averages six months

- Certain types of projects can go more quickly and others more slowly
- R&D projects take substantial education and engagement. In contrast, commercial asset sales can get done in as little as three months

Manufacturing and supply is an important component in licensing:

- Most Chinese companies prefer to tech transfer manufacturing to China
  - To enjoy benefits of tax breaks, land purchase and support in regulatory approval
  - To control supply
  - To be competitive in COGs

The regulatory filing pathway is driven by where drug is manufactured:

- IDL (Imported Drug Filing): drug made outside China
- Domestic Drug Filing: drug made in China by local manufacturer
- Depending how your choice of product supply, you might have different obligations and responsibilities
  - For IDL pathway, the Chinese drug administration requires site audit and compliance to Chinese regulation

Licensing is the most common type of deal structure, with an upfront payment, milestones and a royalty system

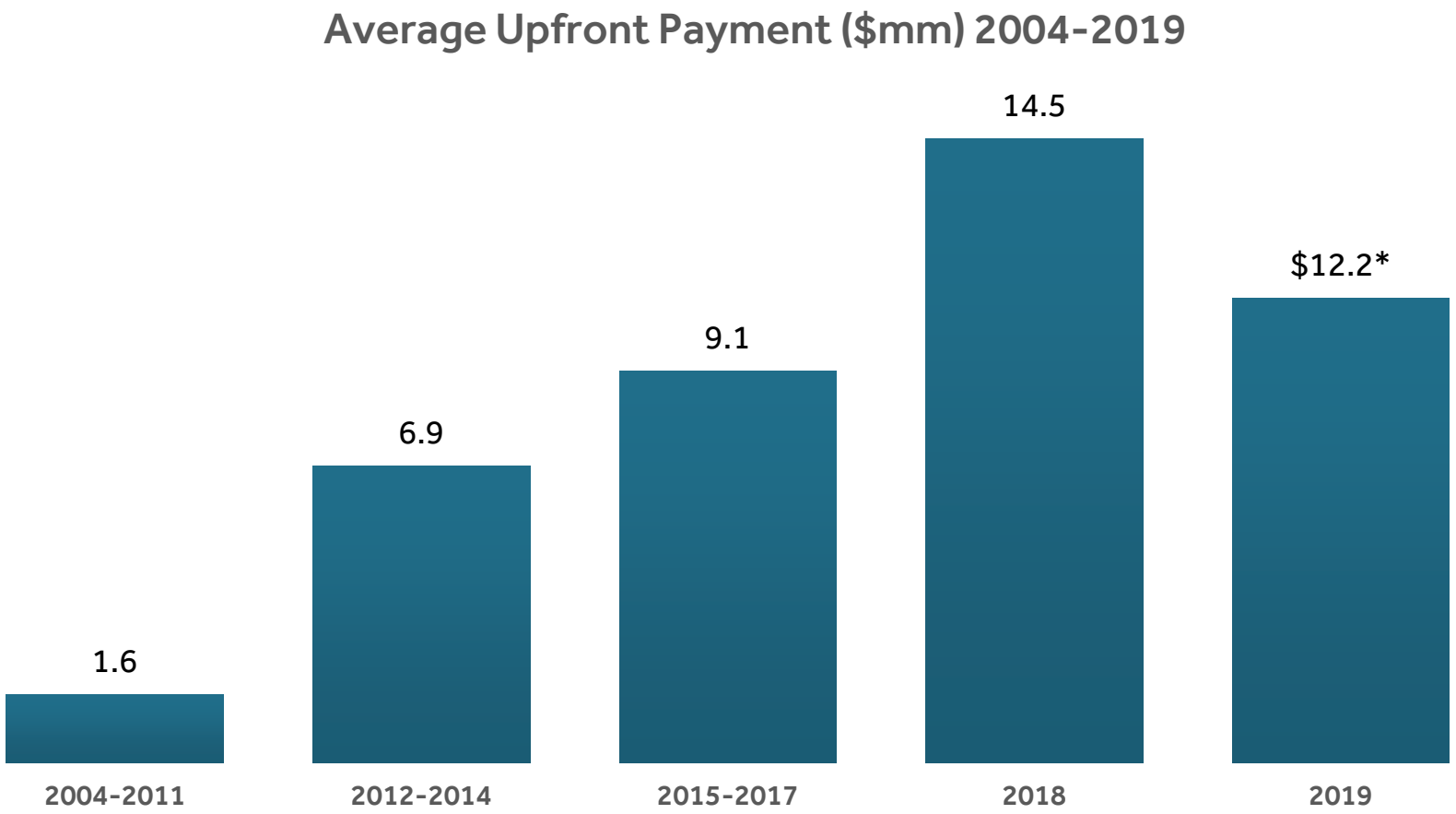
Selected Deal Structure Types

	EVEREST MEDICINES	SALUBRIS 信立泰	罗欣药业 LUOXIN PHARMACEUTICAL	Prokang 浙江普康生物技术股份有限公司 ZHEJIANG PUKANG BIOTECHNOLOGY CO.,LTD.	华东医药股份有限公司 HUADONG MEDICINE CO.,LTD.
Structure	Traditional licensing	Investment with Licensing	JV	Divestiture	M&A
Originator	Immunomedics	Viracta	Aurobindo	Indivior	Sinclair
Date	4 / 2019	12 / 2018	12 / 2018	2 / 2019	11 / 2018
Asset	Sacituzumab	Nanatinostat (VRx-3996)	13 respiratory products in Blow Fill Seal formulation (BFS)	Suboxone / Sai Bo Song Tablet	Silhouette InstaLift® and other approved products
Phase ex-China	NDA filed	Phase 1b/2	Various	On market	On market
TA	Oncology	Oncology	Respiratory	CNS	Dermatology
Territory	Greater China, South Korea and certain Southeast Asian countries	Mainland China only	China for JV JV supplies US and EU markets	China	Global
Upfront	$65m	$10m equity investment	$50m initial capital investment	$17.5m upon closing	$222m
Additional Milestones	$60m upon US approval $710m development and sales milestones	$58m	N/A	$105m	N/A
Royalties	Escalating tiered royalties starting in mid teens	Tiered royalties	N/A	Yes, not disclosed	N/A

Licensing Deal Values

Upfront Payments Over Time

UPFRONT PAYMENTS HAVE CREPT UP OVER TIME DUE TO INCREASING MARKET SIZE AND COMPETITION FOR DEALS.



*Through November 2019.

Source: Torreya China Deal Database, November 2019.

Biotech companies in China are more willing to pay higher upfront in licensing transactions

Strategic vs Biotech

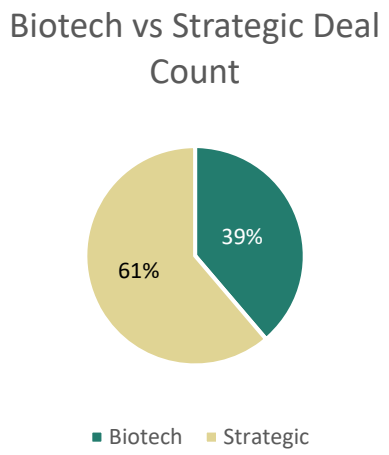
- Strategic Companies have sales, sales force, manufacturing facilities, and are generally returning a profit
- Biotech Companies are VC-funded with less than 10 years of existence, returning little to no sales (e.g., I-Mab, Everest Medicine)

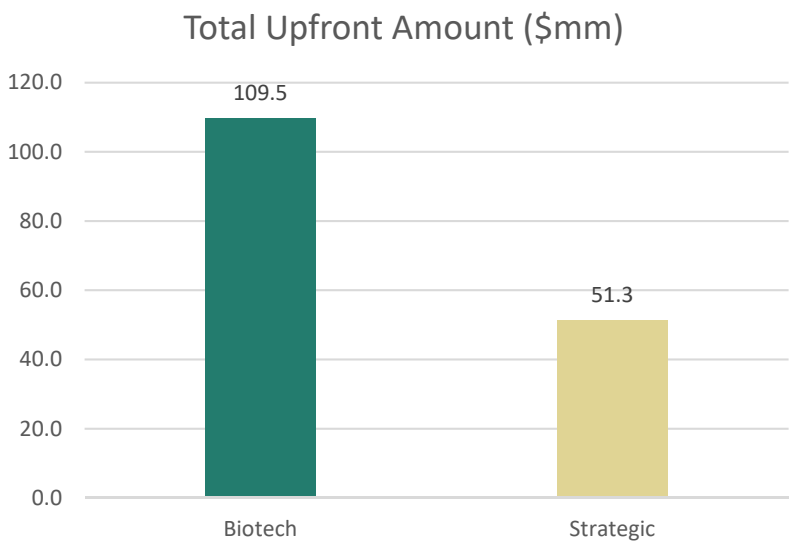
Total Deal Count – Strategic

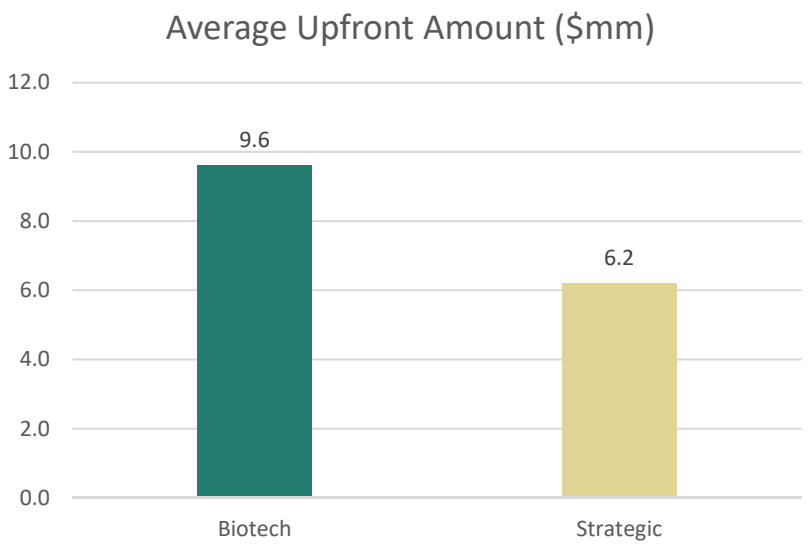
- Strategic Pharma companies lead in total deal count
- Biotech Deal Count expected to rise as more companies enter then China space

Average Upfront Payment – Biotech

- Biotech has higher average upfront payments
- Total Upfront Amounts for biotech are more than twice the size of strategic







Source: Torreya China Deal Database, July 2019

Therapeutic Area Breakdown and Deal Statistics

Cancer Focused Deals Lead China Licensing Activity

Therapeutic Area	Deal Count	Percent of Deals	Upfront Payment Average ($mm)	Total Deal Average ($mm)
Cancer	169	39.5%	$12.6	$134.4
Cardiometabolic	45	10.5%	$11.5	$68.4
Anti-Infectives	24	5.6%	$5.4	$65.7
Virology	24	5.6%	$2.5	$56.3
Central Nervous System	23	5.4%	$12.7	$100.3
Hospital	23	5.4%	$5.5	$33.3
Autoimmune/Inflammatory	21	4.9%	$2.9	$56.8
Pain	12	2.8%	$2.8	$22.8
NA	11	2.6%	$12.5	$176.0
Women's Health	11	2.6%	$5.0	$105.0
Dermatology	10	2.3%	$2.8	$4.5
Ophthalmology	10	2.3%	$3.8	$42.7
Gastrointestinal	9	2.1%	$12.1	$141.3
Renal	9	2.1%	$6.3	$48.1
Respiratory	8	1.9%	$1.0	$82.3
Bone & Orthopedics	5	1.2%	$3.3	$10.5
Hematology	5	1.2%	$8.7	$188.6
Liver Disease	4	0.9%	$35.0	$52.4
Men's health	3	0.7%	NA	$0.2
Pediatrics	1	0.2%	NA	NA
Rare Disease	1	0.2%	NA	NA
Total	428			

The table at left shows the breakdown of China in-licensing deals by therapeutic area. The disease burden and payment system is different in China than in the West.

By far the greatest area of licensing activity has been cancer (39.5%) followed by cardiometabolic (10.5%).

Other popular areas for deals include anti-infectives, hospital, pain, GI, dermatology, inflammation, CNS, stroke and virology.

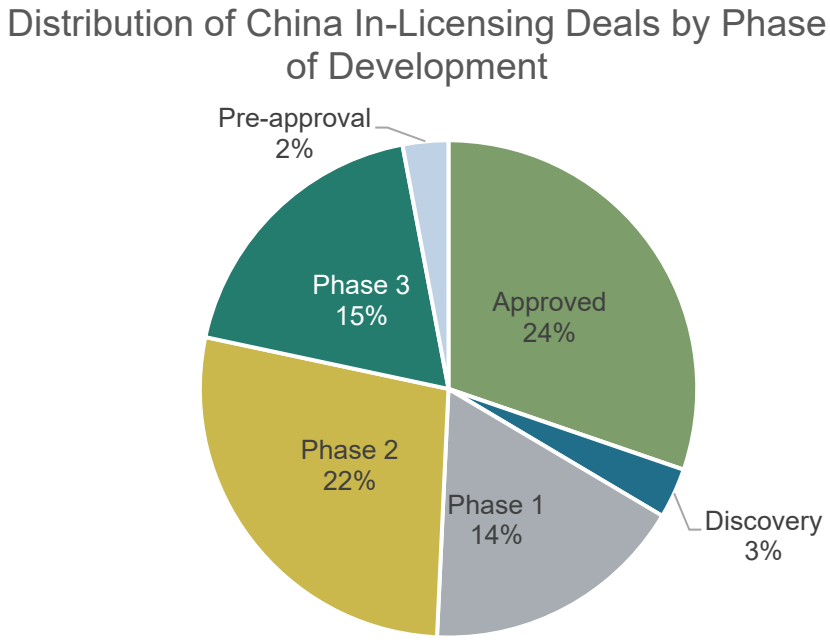
The TA with the highest average upfront has been liver disease followed by CNS. The highest total deal averages have been associated with Hematology and Gastrointestinal medicines.

Source: Torreya China Deal Database, November 2019.

Phase of Development Breakdown and Deal Statistics

Majority of Deals are Phase 2 or Later

Stage	China Deal Count	Percent of Deals	Upfront Payment Average ($mm)	Total Deal Average ($mm)
Approved	102	24%	$8.8	$47.8
Discovery	11	3%	NA	NA
Phase 1	58	14%	$9.5	$124.4
Phase 2	94	22%	$6.9	$97.6
Phase 3	63	15%	$16.3	$127.0
Pre-approval	10	2%	$11.3	$174.2
Preclinical	90	21%	$3.4	$59.2
Total	428			



Source: Torreya China Deal Database, November 2019.

The table at left shows the breakdown of China in-licensing deals by phase of development.

The greatest area of licensing activity has been for approved products (24% of deals).

But there is robust activity at all points of development. Notably, 21% of deals were done at the preclinical level. Chinese pharmaceutical companies have robust R&D capabilities and are willing to collaborate with their Western counterparts on interesting science.

China Licensing Deals Expected to Continue Growing Driven by the New NMPA Policies

2019 Transactions - Late-Stage Products ($ in mm)

Deal Date	Licensee	Licensor	Asset(s)	Indication(s)	Stage	Upfront	Milestones	Total
Nov-19	Beigene	Amgen	XVEGA, Kyprolis, BLINCYTO	Oncology	Approved	NA	NA	NA
Nov-19	CASI Pharmaceuticals	Pharmathen	LAI Octreotide	Oncology	Approved	NA	NA	NA
Nov-19	AstraZeneca	Sun Pharma	Oncology Products	Oncology	Approved	NA	NA	NA
Jul-19	Zai Lab	Incyte	INCMGA0012	Endometrial Cancer	Approved	NA	NA	NA
Jun-19	China Medical System	Sun Pharma	Cequa	Dry Eye	Approved	NA	NA	NA
May-19	Winhealth Pharma Group	Cumberland Pharma	Acetadote	Overdose	Approved	NA	NA	NA
Feb-19	Prokang	Indivior	Sai bo Song	Addiction	Approved	17.5	105	122.5
Jan-19	Ocumension	Gene Technoscience	Ophthalmic biosimilar	AMD	Approved	NA	NA	NA
Nov-19	Hengrui	Novaliq	NOV03 / Cyclasol	Dry Eye	Phase 3	9	156	165
Jul-19	Ocumension	Eyepoint Pharma	Durasert	Posterior Uveitis	Phase 3	2.3	12.5	14.8
Jun-19	Eddingpharm	Shionogi	Lusotrombopag	Thrombocytopenia	Phase 3	NA	NA	NA
Jun-19	Terns Pharma	Genfit	Elafibranor	NASH	Phase 3	35	193	228
Jun-19	Zai Lab	Deciphera	Ripretinib	GIST	Phase 3	20	185	205
Jun-19	Everest Medicines	Calliditas	Nefecon	IgA Nephropathy	Phase 3	15	106	121
May-19	HanX Biopharmaceuticals	Onconova	Rigosertib	Leukemia, Other Cancer	Phase 3	2	49.5	51.5
Apr-19	Everest Medicines	Immunomedics	Sacituzumab Govitecan	Breast Cancer	Phase 3	65	710	775
Apr-19	Luye Pharma	PharmaMar	Zepsyre	Lung Cancer	Phase 3	5	NA	NA
Feb-19	Grandpharma	Glenmark	Ryaltris	Allergy	Phase 3	NA	NA	NA
Jan-19	Jingdong Pharma	Athenex	KX2-391	Actinic Keratosis	Phase 3	14.5	15	29.5

2019 Late Stage/Ph.3

1st Quartile:	$4	$50	$52
Median:	$15	$106	$123
Mean:	$17	$170	$190
3rd Quartile:	$19	$185	$205

China Licensing Deals Expected to Continue Growing Driven by the New CFDA Policy (continued)

2019 Transactions – Phase 2

($ in mm)

Deal Date	Licensee	Licensor	Asset(s)	Indication(s)	Stage	Upfront	Milestones	Total
Nov-19	Fosun	MimiVax	SurVaxM	Glioblastoma brain cancer	Phase 2	10	138	148
Nov-19	Simcere	Aeromics	AER-271	Stroke	Phase 2	NA	NA	NA
Oct-19	GrandPharma	OncoSec	Tavo	Oncology	Phase 2	NA	NA	NA
Sep-19	Simcere	JW Pharma	URC-102	Gout	Phase 2	NA	NA	NA
Jul-19	Abbisko Therapeutics	X4 Pharmaceuticals	Mavorixafor	Pancreatic	Phase 2	NA	NA	NA
Jul-19	Ocumension	Nicox	NCX 4251	Ophthalmology	Phase 2	2	10	12
Jul-19	Asieris	Photocure	Cevira	Cancer	Phase 2	5	18	23
Apr-19	Fosun Pharmaceutical	Reneuron	CPX Program, Hspc	Hospital	Phase 2	7.9	104.8	112.7
Apr-19	BioSense Global	Rexahn Pharmaceuticals	RX-3117	Cancer	Phase 2	3	226	229
Mar-19	Transcenta, Hangzhou Just Biotherapeutics	Lilly	Blosozumab	Bone & Orthopedics	Phase 2	NA	NA	NA
Feb-19	Affamed Biotherapeutics	Samsung Bioepis	Various biosimilars	Ophthalmology	Phase 2	NA	NA	NA

2019 Ph.2

1st Quartile:	$3	$18	$23
Median:	$5	$105	$113
Mean:	$6	$99	$105
3rd Quartile:	$8	$138	$148

China Licensing Deals Expected to Continue Growing Driven by the New CFDA Policy (continued)

2019 Transactions – Early Stage

($ in mm)

Deal Date	Licensee	Licensor	Asset(s)	Indication(s)	Stage	Total
Feb-19	Chia Tai Tianqing Pharmaceutical, NJCTTQ	Abpro		Broad Focus Cancer	Discovery	NA
Feb-19	3SBio	Verseau Therapeutics		Broad Focus Cancer	Discovery	NA
Nov-19	Ningbo Tai Kang Medical Technology	AstraZeneca	AZD3229, KIT inhibitor	Oncology	Preclinical	NA
Nov-19	BeiGene	Seattle Genetics	Oncology Product	Oncology	Preclinical	NA
Oct-19	Brii Biosciences	Qpex Biopharma	Multiple products	Infections	Preclinical	NA
Oct-19	3SBio	Verseau Therapeutics	Multiple MCM antibodies	Oncology	Preclinical	NA
Aug-19	Biotheus	Alligator Bioscience	Research antibody	Oncology	Preclinical	143
Jun-19	EOC Pharma	Shionogi	Epertinib	Breast Cancer	Preclinical	NA
Apr-19	CASI Pharmaceuticals	Black Belt Therapeutics	TSK011010	Solid tumors	Preclinical	NA
Apr-19	Shanghai Miracogen	Synaffix	ADC Technology	Various	Preclinical	125
Apr-19	BeiGene	Bioatla, LLC	BA3701	Solid tumors	Preclinical	269
Jan-19	Betta Pharmaceuticals	Merus BV	MCLA-129	Lung Cancer	Preclinical	NA
Jan-19	Shanghai Furen Medicine	AstraZeneca		Lung, Solid Tumors	Preclinical	NA
Nov-19	Brii Biosciences	AN2 Therapeutics	NA	Antibiotic	Phase 1	NA
Nov-19	Brii Biosciences	Artizan Biosciences	NA	Antibiotic	Phase 1	NA
Nov-19	Fosun Pharma	MimiVax	SurVaxM	Glioblastoma	Phase 1	148
Jul-19	I-Mab	MacroGenics	Enoblituzumab	Head & Neck Cancer	Phase 1	150
Apr-19	Shanghai Junshi Biosciences	Ascentage Pharma	APG-1387	Leukemia, Lymphoma, Multiple Myeloma, Solid Tumors	Phase 1	NA
Mar-19	China National Biotec Group, Lanzhou Institute of Biological Product	ImmunoBiology		Other Infectious-Bacterial	Phase 1	NA
Feb-19	Ascletis Pharma	3-V Biosciences		Fatty Liver	Phase 1	NA
Jan-19	Ascletis Pharma	Alphamab	KN035	Hepatitis B	Phase 1	NA
Jan-19	Everest Medicines	Spero Therapeutics	SPR206, SPR741	Gram Negative Infections	Phase 1	61.5

2019 Early Stage

1st Quartile:	$130
Median:	$146
Mean:	$149
3rd Quartile:	$150

Comparison to Japan In-Licensing Deals

China Territory In-Licensing Deal Statistics

Stage	China Deal Count	Percent of Deals	Upfront Payment Average ($mm)	Total Deal Average ($mm)
Approved	102	24%	$8.8	$47.8
Discovery	11	3%	NA	NA
Phase 1	58	14%	$9.5	$124.4
Phase 2	94	22%	$6.9	$97.6
Phase 3	63	15%	$16.3	$127.0
Pre-approval	10	2%	$11.3	$174.2
Preclinical	90	21%	$3.4	$59.2
Average			$9.4	$105

Japan Territory In-Licensing Deal Statistics

Phase	Japan Deal Count	Percent of Deals	Upfront Payment Average ($mm)	Total Deal Average ($mm)
Approved	40	18.4%	$73.2	$174.4
Pre-approval	4	1.8%	$39.0	$431.7
Phase 3	32	14.7%	$26.5	$229.4
Phase 2	32	14.7%	$33.7	$225.8
Phase 1	18	8.3%	$13.0	$154.7
Preclinical	91	41.9%	$17.4	$316.8
Average	217		$33.0	$323.0
Japan vs. China			**3.5X**	**3.1X**

The tables at left shows the breakdown of China in-licensing deals by phase of development versus Japan in-licensing deals.

The average upfront on a Japan deal is 3.5x times higher than that for a China deal. The total deal packages for Japan are about 3.1x times of Chinese ones.

The difference is a reflection, of course, of the economic value of products in each territory. With a GDP/Capita almost five times higher, the ability to achieve higher pricing for products in Japan more than outweighs the larger size of the Chinese population.

We do expect to see the gap in deal economics between the territories narrow in the years ahead.

Source: Torreya China Deal Database, November 2019.

Out-licensing from China

TORREYA

China Outlicensing is Expected to Grow in the next 5 - 10 years

- Historically very limited out licensing of innovative products
  - Mainly due to little R&D spending
  - Limited to a few pharma companies or biotech companies
- Out-licensing or finding a distribution partners for generic products very active
- We have seen increasing activities of outlicensing efforts by Chinese companies in 2018 and 2019
  - Increased filing of IP from China
  - ICH member and participating in global multi-center trials
  - Increased spending in R&D
  - Overall improvement of R&D capabilities with increasing return of US trained scientists

Chinese Pharma Companies' Ex-China Collaboration Structure

	Innovent	恒瑞	BeiGene	LEGEND BIOTECH	恒瑞	TASLY
Global Partner	Eli Lilly	Incyte	Celgene	Janssen	Arcutis	Arbor Pharma
Date	Mar. 2015	Sep. 2015	Jun. 2017	Dec. 2017	Jan. 2018	Sep. 2018
Asset	3+ Cancer Treatments	SHR-1210 (PD-1 Inhibitor)	BGB-A317 (PD-1 Inhibitor)	LCAR-B38M (CAR-T therapy)	SHR0302 (JAK inhibitor)	T89 for CV disease
Phase in China	Preclinical to Ph1	Ph2 Ready	Ph3 Ready	Filed	Ph2	Approved
Indication	Oncology	Oncology	Oncology	Oncology	Derm/Autoimmune	Cardiovascular
Structure	• Lilly received ex-China rights to an antibody targeting CD20 and a preclinical immunotherapy • Innovent got the China rights to Lilly's c-Met antibody program • Lilly added another $1bn milestone payment for ex-China rights to 3 PD-1 assets in Oct. 2015	• Incyte to develop and commercialize SHR-1210 ex-China	• BeiGene retained ex-Japan Asia rights and Celgene to develop and commercialize ROW • BeiGene acquired Celgene's commercial operations in China and gain an exclusive license to commercialize Celgene's approved therapies in China	• Janssen received WW license to jointly develop and commercialize LCAR-B38M in multiple myeloma with Legend team • Janssen may record ex-China sales • 50/50 cost-sharing/profit-split ex-China and 30/70 in China	• Arcutis obtained exclusive rights to conduct clinical development and pursue a US, EU, and Japan license for the commercialization of a topical application of SHR0302	• Arbor gained US rights to T89 and may contribute up to $23mm for clinical research and regulatory approval by the FDA • Arbor also obtained exclusive commercialization right in the US
Upfront	$56mm	$25mm	$263mm +$150mm in equity	$350mm	$233mm	-
Milestones	$1.4bn	$770mm	$980mm	-		$50mm
Royalties	Not disclosed	Tiered	Not disclosed	50% profit share ex-China and 70% in China	Not disclosed	50% gross profit

Outlook for Pharma Cross-Border Deals Involving China

- M&A and investment into US or other western countries might slow down in the short term due to CFIUS, trade dispute and geopolitical reasons
- Licensing into China is expected to dominate transactions with structure variations
  - Global participation
  - Equity investment
  - China funding new indication (ICH membership)
  - Increasing upfront and overall payment
- Late stage remains highest interest
  - De-risk
  - VC expectation of 5 year return
- Increased investment from VCs in healthcare is expected to accelerate deal activities and increasing deal terms
  - VC backed biotech companies might be more active and more willing to pay in order to win
  - VC more willing to form a company with own management team and in licensing products from global pharma companies
- Oncology is projected to remain highest attention but we have seen increasing interests in renal, diabetes, ophthalmology

Torreya China Team and Capabilities

Torreya is the most active advisory firm in China licensing.

Due to its dedicated China licensing advisory team and market knowledge Torreya has rapidly become the leader in inbound asset level transaction advisory roles involving the Chinese pharmaceutical sector

League Table, Advisory Roles in Pharma Sector China Licensing and Asset Sale Transactions, 2015 to 2019

Rank	Company	Deals Completed	Upfront Payment Total ($mm)
1	Torreya	8	$73.25
2	BFC	3	$23.0
3	TPP	2	$10.0
4	China Renaissance	1	$15.0
5	Agile Capital	1	NA
6	Geller Biopharm	1	NA

The next page looks at a broader set of deal types, including M&A and joint ventures

Sources: Data based on public information and Torreya China Deal Database, December 2019

Torreya is the Most Active Financial Advisor Focused on the Chinese Pharma sector

Top Financial Advisors in Pharmaceutical Industry M&A, JVs and Licensing Deals involving a China Party

Jan 1, 2015 to November 22, 2019 by Deal Count, Includes Closed Transactions

Advisor	Headquarters	Cross-border License Deals	Cross-border M&A, Asset Sales & Joint Ventures	Domestic Deals	Total Advisory Roles
Torreya	USA	7	3	0	10
China International	China	0	0	6	6
TPP Healthcare	USA	4	1	0	5
Mingsheng Securities	China	0	0	4	4
CITIC Securities	China	0	0	3	3
Southwest Securities	China	0	0	3	3
BFC Group	USA	3	0	0	3
Zhejiang Securities	China	0	0	2	2
Northeast Securities	China	0	0	2	2
Optima Capital	China	0	0	2	2
Minzu Securities	China	0	0	2	2
JP Morgan	USA	1	0	1	2
Credit Suisse	Switzerland	0	2	0	2
Haitong Securities	China	0	2	0	2
Centerview	USA	0	2	0	2
Jefferies	USA	0	2	0	2
Piper Jaffray	USA	0	2	0	2
PWC	China	0	0	1	1
GF Securities	China	0	0	1	1
Goldman Sachs	USA	0	1	0	1
Lazard	USA	0	1	0	1
Morgan Stanley	USA	0	1	0	1
Nomura	Japan	0	1	0	1
Rothschild	France	0	1	0	1

Sources: Torreya China Deal Database, December 2019

Torreya Transactions to China

China License in oncology, Phase 2 + Investment

Pediatrics, Phase 2 Cardiovascular

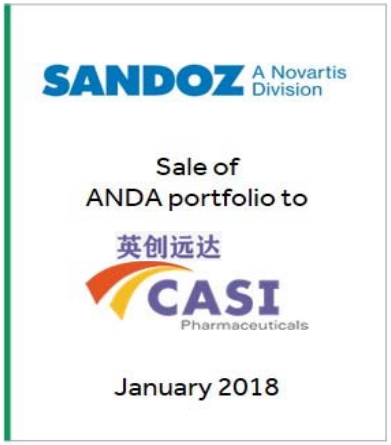
Orphan in US, Phase 3 Renal disease, 505(b)(2)

Suboxone, Approved Drug Addiction

Joint Venture Respiratory

Orphan, Approved Ophthalmology, 505(b)(2)

Hemodialysis, Phase 2 Renal disease



Mainly oncology, Approved

Example of Torreya Advised China Transactions 2019

Deals for Oncosec and Calliditas

ONCOSEC CHINA GRAND CASE STUDY

- Oncosec's product TAVO™ has the potential to become the first marketed therapeutic to address anti-PD-1 non-responders in cancer
- China Grand showed interest in this idea because it owns a 49% stake in Sirtex and has interest in growing this company's business plus building its presence in China
- The deal involves a 49% investment in Oncosec by Grandpharma, a subsidiary of China Grand and a 3% investment by Sirtex itself
- Terms were upfront: $30M for 52% interest plus China license plus a 20% royalty rate on China license and commercialization support from Sirtex in exchange for a single digit royalty

oncosec IMMUNOTHERAPIES

Sale of Majority Stake to

远大医药 GRANDPHARMA

SIRTeX

$30 million

Pending

CALLIDITAS LICENSE TO EVEREST MEDICINES

- Torreya was retained by Calliditas, a public company based in Sweden, to assist with partnering China rights to Nefecon®, a sustained release of budesonide in oral formulation. This renal product was in Phase 3 clinical trials in Europe
- Torreya was brought in after the Calliditas received interest and had initiated contacts with several parties but needed an advisor that understands China market, relevant players and partnering process
- Upfront: $15M with $106M additional milestones and escalating royalty rates

calliditas THERAPEUTICS

License Agreement of Nefecon in China to

EVEREST MEDICINES

$121 million

($15mm upfront)

June 2019

Torreya China Team

Leader, China Transactions	Licensing Support	China M&A Support	China M&A Support	China M&A Support
				
Jie Liu Managing Director, M&A, Licensing	**Jocelyn Lyu** Analyst, China Licensing	**Kylor Hua** Vice President, M&A, Licensing	**Vivian Xu** Associate, M&A, Licensing	**Tim Opler** Partner, New York
• Leads China coverage for Torreya • Spends several months a year on China business development activities • Was at J&J and Teva in BD • MBA, Wharton • Speaks Mandarin	• Supports China licensing work • Was investment banking analyst at FE International • Previous roles at Timberwind Capital and Jebsen Industrial. • MS Finance, Fordham • Speaks Mandarin	• 20+ transactions at Torreya with total value over $2 billion • Strong in M&A and licensing processes • B.A. in Economics & Cog. Sci., University of Rochester • Speaks Mandarin & Japanese	• Joined Torreya in July 2016 • Formerly Analyst at Fosun Group, healthcare investment team • M.P.A., Columbia University • Speaks Mandarin	• Co-founded Torreya in 2007 • Formerly banker at Credit Suisse and Professor of Finance at Ohio State • Ph.D., UCLA, Economics

- Torreya's China team regularly calls on 50+ Chinese corporates and investors.
- Four members of the team are Mandarin speakers
- Key activities include inbound partnering; outbound M&A and domestic M&A advisory
- Members of the team are in China at least six times a year

Disclaimer

This presentation may not be used or relied upon for any purpose other than as specifically contemplated by a written agreement with Torreya. This publication has been prepared for general guidance on matters of interest only, and does not constitute professional advice. You should not act upon the Information contained in this publication without obtaining specific professional advice. The information used in preparing these materials was obtained from or through public sources. Torreya assumes no responsibility for independent verification of such information and has relied on such information being complete and accurate in all material respects. No representation, warranty or undertaking, express or implied, is made and no responsibility is accepted by Torreya as to or in relation to the accuracy or completeness or otherwise of these materials or as to the reasonableness of any other information made available in connection with these materials (whether in writing or orally) to any interested party (or its advisors). Torreya will not be liable for any direct, indirect, or consequential loss or damage suffered by any person as a result of relying on any statement contained in these materials or any such other information. None of these materials, the information contained in them or any other information supplied in connection with these materials, will form the basis of any contract. To the extent such information includes estimates and forecasts of future financial performance (including estimates of potential cost savings and synergies) prepared by or reviewed and discussed with the managements of the Company and/or other potential transaction participants or obtained from public sources, we have assumed that such estimates and forecasts have been reasonably prepared on bases reflecting the best currently available estimates and judgments of such managements (or, with respect to estimates and forecast obtained from public sources, represent reasonable estimates). There is no guarantee that any of these estimates and projections will be achieved. Actual results will vary from the projections and such variations may be material. Nothing contained herein is, or shall be relied upon as, a promise or representation as to the past or future. Torreya expressly disclaims any and all liability relating or resulting from the use of this presentation. Torreya assumes no obligation to update or otherwise review these materials. These materials have been prepared by Torreya and its affiliates and accordingly information reflected or incorporated into these materials may be shared with employees of Torreya and its affiliates and agents regardless of location. This presentation speaks only as of the date it is given, and the views expressed are subject to change based upon a number of factors, including market conditions.

Distribution of this presentation to any person other than the recipient is unauthorized. This material must not be copied, reproduced, distributed or passed to others at any time without the prior written consent of Torreya. This presentation has been prepared solely for informational purposes and is not to be construed as a solicitation or an offer to buy or sell any securities or related financial instrument. You should not construe the contents of this presentation as legal, tax, accounting or investment advice or a recommendation. Torreya does not provide any tax advice. Any tax statement herein regarding any U.S. federal or other tax is not intended or written to be used, and cannot be used, by any taxpayer for the purpose of avoiding any penalties. Any such statement herein was written to support the marketing or promotion of the transaction(s) or matter(s) to which the statement related. Each taxpayer should seek advice based on the taxpayer's particular circumstances from an independent tax advisor. This presentation does not purport to be all-inclusive or to contain all of the information that the Company may require. No investment, divestment or other financial decisions or actions should be based solely on the information in this presentation.

The distribution of these materials in certain jurisdictions may be restricted by law and, accordingly, recipients represent that they are able to receive this memorandum without contravention of any unfulfilled registration requirements or other legal restrictions in the jurisdiction in which they reside or conduct business. By accepting these materials, the recipient agrees to be bound by the foregoing limitations. Insofar as these materials originate in the United Kingdom or are capable of having an effect in the United Kingdom (within the meaning of section 21 of the Financial Services and Markets Act 2000) they are directed only at classes of recipient at whom they may lawfully be directed without contravening that section or any applicable provisions of the Conduct of Business Sourcebook of the Financial Conduct Authority, including persons of a kind described in Article 19 (Investment professionals) or Article 49 (High net worth companies, unincorporated associations etc.) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (as amended) and are not intended to be distributed or passed on, directly or indirectly, to or relied or acted on, by any other class of persons. Torreya (Europe) LLP, which is authorised and regulated in the United Kingdom by the Financial Conduct Authority, is not acting for you in connection with any potential transaction(s) described in these materials and thus will not be responsible for providing you the protections afforded to clients of Torreya (Europe) LLP or for advising you in connection with any potential transaction(s) as described in these materials except and unless subject to a subsequent specific written agreement relating to such potential transaction(s) between you and Torreya (Europe) LLP.

Torreya (Europe) LLP is authorised and regulated by the Financial Conduct Authority. Securities offered in the United States are offered through Torreya Capital LLC, Member FINRA/SIPC.