

Special report

# Pharmaceutical innovation in the APAC region

A quantitative company ranking  
and future outlook



## Foreword

The Asia Pacific region has long been seen as a land of opportunity for the pharmaceutical industry. Therefore, it's worth exploring which companies are realizing the benefits and what direction development in the region is headed.

Which countries/regions are creating the most conducive environment for innovation? Which companies are currently leading the way... and which ones are on the cusp of seizing the growth opportunity afforded by innovation? How does a company's innovation profile factor into its success?

We address these and other questions in this report, which we hope serves as a catalyst for discussion about the role the Asia Pacific region plays in shaping the future of drug development.



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## Introduction

The Asia Pacific (APAC) region, already a strong contributor to global pharmaceutical market growth, is poised for continued gains in the coming years.

Given the importance of the region to the industry's future, Clarivate Analytics undertook an extensive, data-driven analysis of 1,032 companies in 14 APAC countries/regions to measure their degree of innovation – and to identify “up and coming” organizations that are worth watching.

This is the first such analysis to focus *exclusively* on APAC with a methodology designed *specifically* for the pharmaceutical industry and for less mature markets. Unlike other studies of innovation, the results for APAC presented here are not overshadowed by findings on a global scale, nor have the measures of innovation been retrofitted to the region.

We performed our analysis on data collected through Q1 2019, and confined our research to pharmaceutical and biopharmaceutical products, considering ancillary innovation in drug delivery, devices and diagnostics as out of scope.\*

Analysis focuses *exclusively*  
on the APAC region

\* Given the number of companies involved, we relied on data sources that were both readily available and easily interrogated. This, in turn, restricted the parameters we could evaluate. We have also eliminated state-owned development activity from our study as well as pure-play generics companies.

# The region by the numbers





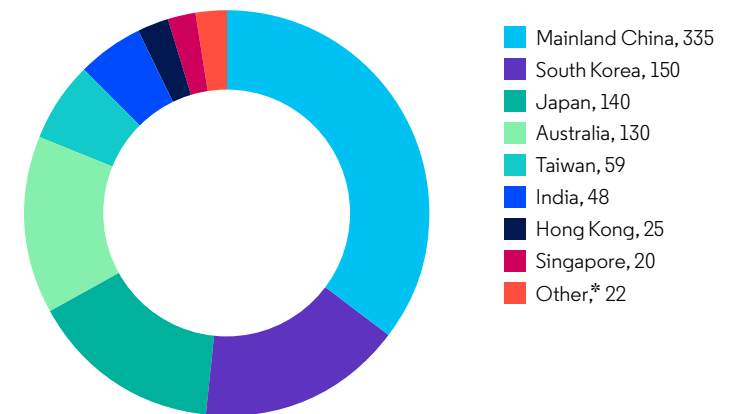
## Distribution of companies by country/region

Pharmaceutical companies are prolific in APAC; our original data set included 46,509 companies across 14 countries/regions! Based on the availability of information, we were able to study a cohort of 929 companies (including multi-national companies) that have or are developing innovative pharmaceutical products. All analyses detailed in this report are based on that cohort.

Within our filtered data set, Mainland China has by far the largest number of pharmaceutical companies headquartered within it (335), followed by South Korea (150) and Japan (140). In fact, more than a third (36%) of all companies in our study are headquartered in Mainland China.

### Focus on 929 companies across 14 countries/regions

**Country/region breakdown based on headquarters location**



\* "Other" includes New Zealand, Malaysia, Vietnam, Philippines, Thailand and Indonesia. Each contributes  $\leq 1\%$  of companies.



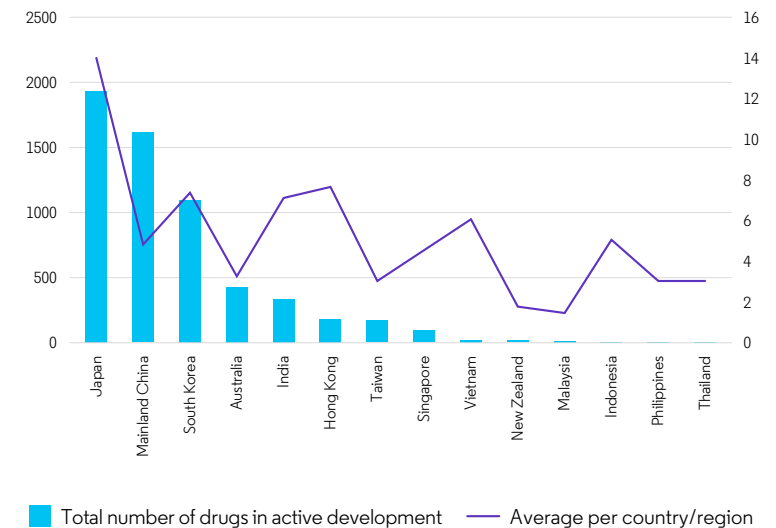
# The development landscape

How does the sheer number of companies translate into development productivity? In the cohort of companies selected for our analysis, there are 5,893 drugs in active development in the region and 1,549 that have been launched.\*

Japan, not surprisingly given its maturity as a market, has the highest number of drugs in active development (nearly 2,000). There are many large Japanese companies with extensive research and development (R&D) portfolios; on average, companies have 14 products in the pipeline, as compared to five and seven for Mainland China and South Korea, respectively.

Less predictable is the large number of drugs in active development in both Mainland China (1,598) and South Korea (1,088). Unlike in Japan, most new products in these countries/regions are being developed by small companies that have only a few assets (and often only one).

**Drugs in active development by country/region**



Average = the total number of projects in the region divided by the number of companies in the region.



## Multi-national company revenues from Mainland China

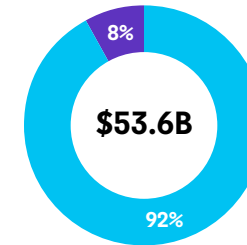
Three leading multi-national companies – Pfizer, Merck & Co., and Sanofi – have reported 2018 revenues from Mainland China in the range of 6-8% of their overall sales. Mainland China is the second largest pharmaceutical market in the world, worth an estimated US\$173 billion in 2018, and is the largest contributor to these Western-based companies' emerging market sales.

Until recently, revenues from Mainland China had been growing in double digits because of the government's interest in innovation and the fact that healthcare spend as a percentage of GDP is relatively low. Today's more conservative forecasts are likely due to the fact that growth is now measured on a larger base as well as a reflection of the broader economic pressures that Mainland China is experiencing.

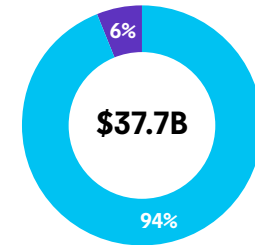
AstraZeneca stands out, however, in that its revenue from Mainland China is more than twice that of the other three global market leaders.

### Proportion of 2018 worldwide sales revenue from Mainland China

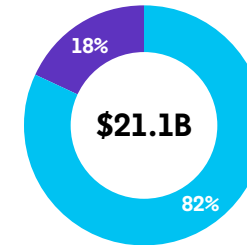
Pfizer



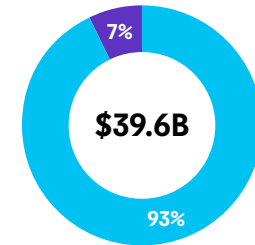
Merck & Co.



AstraZeneca



Sanofi



RoW Mainland China

Pharma revenues only, US\$ billions  
Exchange rate: 1 Euro = 1.15 US \$ (rate on December 31, 2018)

Source: Company websites/annual reports



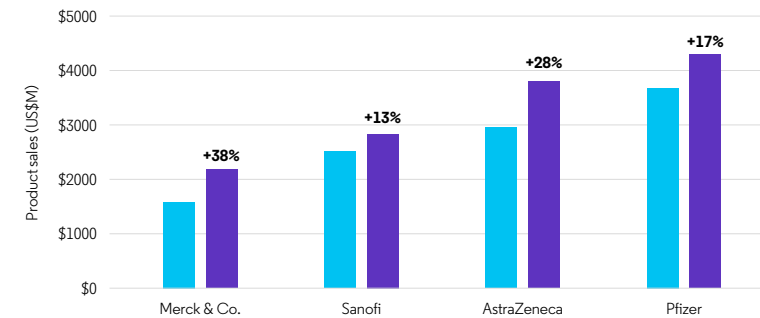


# Multi-national company revenue growth in Mainland China vs. Japan

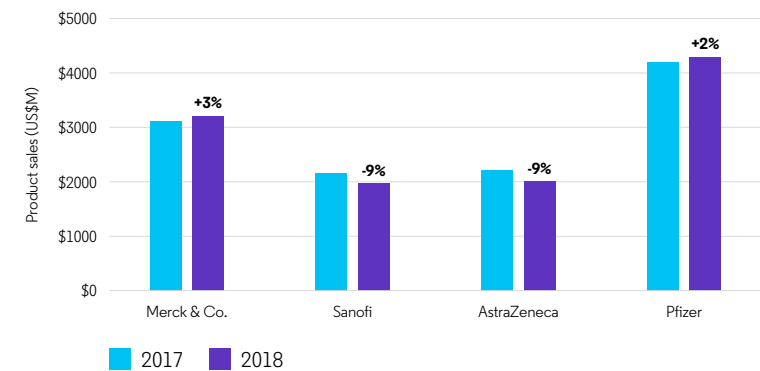
As is seen here, revenues from Mainland China are growing rapidly for four of the leading global players. AstraZeneca's 28% growth in Mainland China is likely the result of the company's strategic and heavy investment in the country/region, including the establishment of a headquarters there in 2012.

Meanwhile, revenues in Japan have clearly been impacted by the negative industry pressures in that country/region. Merck and Pfizer both posted only slight growth in Japan, while Sanofi's and AstraZeneca's sales growth rate in Japan declined between 2017 and 2018.

**Mainland China**



**Japan**



Exchange rate: 1 Euro = 1.20 and 1.15 US\$  
 (on December 31, 2017 and 2018, respectively)

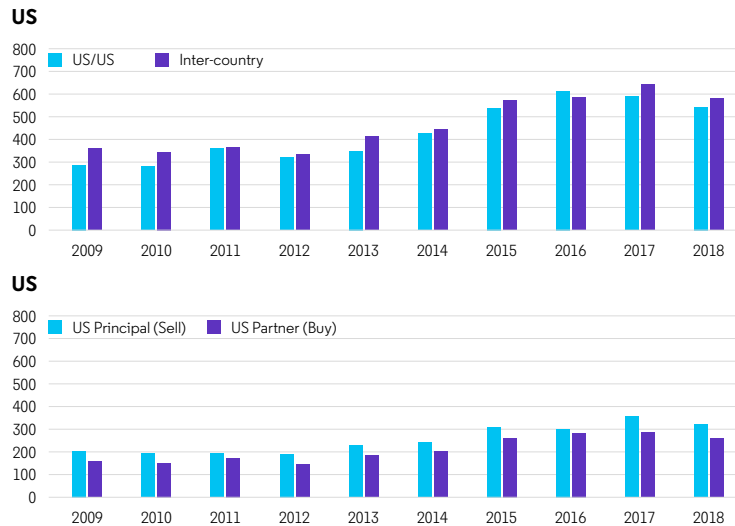
Source: Company websites/annual reports



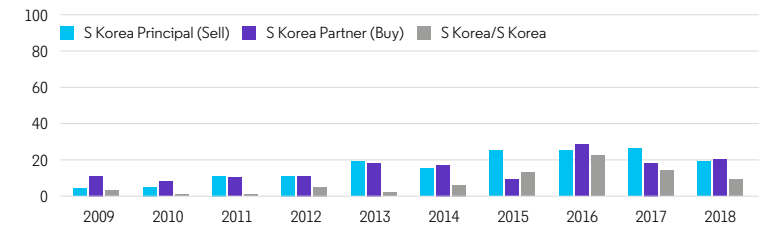
# Deal-making activity

Although the volume of deal-making activity across Mainland China, Japan and South Korea (the three APAC entities that figure most prominently in our analysis) is much lower than in the US, Mainland China shows a much steeper growth rate than the US, where growth has somewhat plateaued. The increase in Mainland China-based companies' "buy-side" activity is particularly pronounced.

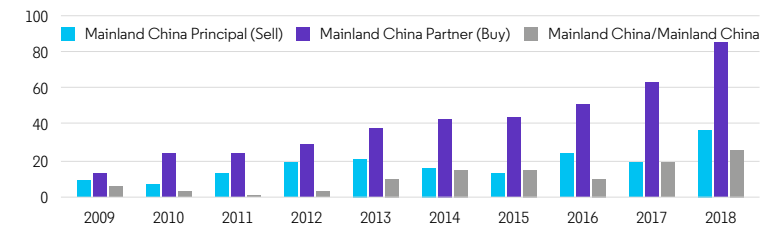
Note: The country/region listed refers to the geographic location of a company's headquarters. "Sell" deals relate to those where the company is the seller of the asset, and "Buy" deals are those in which the company is the purchaser of the asset.



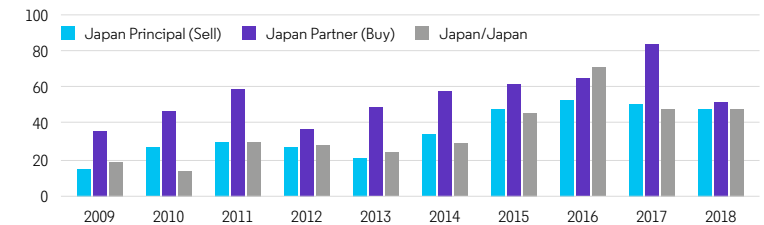
## South Korea



## Mainland China



## Japan





# Macro-environmental factors influencing innovation



The degree of innovation in a country/region is necessarily influenced by a variety of social, economic and regulatory factors – some that encourage innovation and others that inhibit it.

We examine the factors for Mainland China, Japan and South Korea on the following pages.



# Mainland China:

## A generic market striving for more innovation



| Factors advancing innovation   | Factors inhibiting innovation  |
|--|--|
| <p><b>Population</b><br/>Mainland China is the most populous country/region in the world with 1.4 billion people, 17.3% of whom are more than 60 years old.<sup>*1</sup></p> | <p><b>A reliance on generics</b><br/>Innovator products (almost exclusively from foreign-owned companies) make up only 3% of the market.<sup>3</sup></p>   |
| <p><b>Increase in lifestyle diseases</b><br/>Cardiovascular disease is now the leading cause of death (associated with diet and alcohol).<sup>2</sup></p>                    | <p><b>Counterfeiting</b><br/>This is still a significant issue, although draft legislation will prevent the sale of prescriptions online.<sup>5</sup></p>  |
| <p><b>Ownership</b><br/>Many state-owned enterprises are now privately owned and managed operations.<sup>3</sup></p>   | <p><b>Regulated pricing</b><br/>Pricing is strictly regulated. Although the market is primarily generic, prices of generics in Mainland China are, on average, about twice that of in the US, prompting the government's ongoing drive to bring prices down.<sup>6</sup></p> |
| <p><b>Investment in access</b><br/>The government has invested in a long-term plan to facilitate access and improve the healthcare system.<sup>4</sup></p>                   | <p><b>Healthcare spending</b><br/>Healthcare spending as a percent of GDP (6%) lags behind the US (17%) and the EU (10%).<sup>7</sup></p>  |
| <p><b>R&amp;D support (especially for biotech companies)</b><br/>The government is striving to hasten the review and approval of new treatments.<sup>5</sup></p>             |  |

\* An aging population can both spur R&D investment and drain health system budgets



# Japan: Dueling incentives



## Factors advancing innovation

### AMED

The Agency for Medical Research and Development was introduced in 2015 to accelerate R&D projects.<sup>5</sup>

### Promotion of low-cost discovery research

The government is funding start-up projects that use artificial intelligence (AI) in development, reviving a research-based drug industry, and promoting drugs of Japanese origin in global markets.<sup>5</sup>



## Factors inhibiting innovation

### A declining economy

The country's aging population is creating a strain on the economy; cost containment measures are the norm.<sup>8\*</sup>

### Punitive pricing

Measures introduced by the government have impacted smaller, domestic companies.<sup>8</sup>

### Generic substitution

The government target for substitution is at least 80% by 2020.<sup>8</sup>



## South Korea: Full steam ahead



### Factors advancing innovation

#### Push for global biotech

By adding 120,000 new biotech jobs by 2025, South Korea hopes to expand its presence in the global biotech market from its current 1.7% to 5%.<sup>5</sup>

#### Designated economic growth driver

President Moon Jae-In aims to triple the export and global market share of pharmaceutical products and medical instruments by 2030.<sup>9</sup>

#### Government incentives

The government will provide policy loans and tax incentives for innovation.<sup>9</sup>

#### Regulatory boost

An increase in the number of regulators is planned to bring regulatory procedures in line with global standards and reduce approval times from 18 months to 12.<sup>9</sup>

#### Technology upgrade

The Korea Pharmaceutical and Biopharma Manufacturers Association (KPBMA) aims to purchase an AI platform to streamline drug discovery. Samsung Medical Center and Microsoft Korea are building an AI-based healthcare system.<sup>5</sup>



### Factors inhibiting innovation

#### Business interest in selling well-established drugs

Large pharmaceutical companies have traditionally focused on therapies that treat broad patient populations vs. differentiated medicines that address niche patient segments.<sup>10</sup>

#### Lack of investment in clinical discovery and clinical development

A desire to penetrate the larger global markets has led to a reliance on partnering vs. domestic investment.<sup>10</sup>



# Measuring innovation





## Traditional measures of innovation

There is no agreed-upon definition of what constitutes innovation in the pharmaceutical industry. Thus, there is no accepted surrogate marker for it.

A general definition of innovation is: The creation of a new good or service that provides value. But even that simple definition is not easily applied to pharmaceutical and biopharmaceutical products. How do you define “newness?” How do you measure the value of a therapy?

As we planned our research, we considered various measures of innovation that have been suggested by industry analysts, but found that each had a drawback.

| Possible measure of innovation              | Drawback  |
|---|---|
| Simple numeric measures                     | Can be influenced by a particular business model and therefore inadvertently favor a particular subset of companies.                                      |
| Number of patents                           | A measure of innovation, but the straight counting of patents is only part of the picture.  |
| Number of launches                          | A measure of success, but not of innovation. First-in-class launches are a better measure, but a determination of what is “first-in-class” is subjective. |
| Accelerated regulatory approval             | Addressing unmet medical need can be a measure of innovation, but such regulatory designations are not used in all APAC countries/regions.                |
| Revenue or other publicly-reported measures | Would limit inspection to more mature, public companies and overlook the extensive array of private entrepreneurs.  |

The basic definition of innovation is not easily applied to pharmaceutical products



# A multi-faceted approach to measuring innovation: Key parameters

After careful consideration, we decided upon a set of parameters to measure innovation that, while primarily related to pre-development conditions and decisions, nevertheless encompassed a company's broader innovation ecosystem. Thus, not all of our measures are directly tied to drug development projects, but rather reflect a company's general disposition toward innovation.

The measures we selected are largely quantitative, although most are also linked to a qualitative component:



Academic alliances/collaboration



Funding of university research programs



Joint intellectual property (IP)/publications with external collaborators



Publications in high-impact journals



Pipeline composition (specifically, the ability to advance early, collaborative research)



The degree to which R&D has translated into actual drug candidates



International ambition (the degree to which the company is laying the foundation for global expansion)

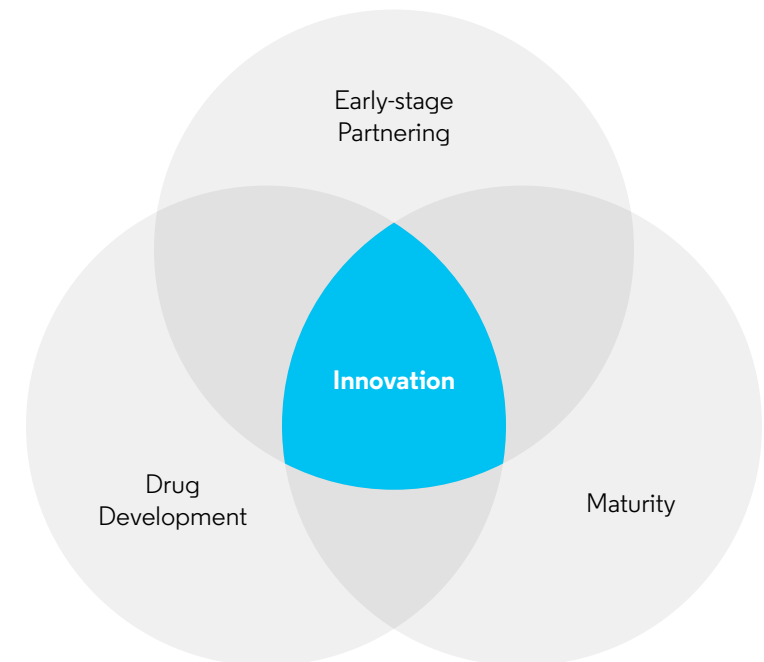


## A multi-faceted approach to measuring innovation: Indices for analysis

To facilitate data interpretation, we subsequently grouped these individual data parameters into three core indices:

- **Early-stage Partnering** included all the parameters related to publication and patent activity, as well as the number of “Buy” and “Sell” academic deals.
- **Drug Development** included the total number of active drugs in the pipeline, the percentage of these drugs that had recently progressed, whether the company had any programs in clinical development, the number of “Buy” and “Sell” deals, and whether the company had any self-originated drugs. It also included a summary parameter that took into account the entirety of a company’s level of R&D activity.
- **Maturity** included the number of recently-launched drugs, whether the company had any drugs approved in one of the IP4 regions (US, Europe, Japan or Mainland China), and the percentage of “Buy” and “Sell” deals a company had in one of the IP4 regions.

A more detailed explanation of our methodology is available [here](#).



The background of the slide is a monochromatic, grayscale abstract pattern. It consists of numerous curved, parallel lines that create a sense of depth and movement, resembling the ribs of a large, curved structure or a series of overlapping, rounded rectangular forms. The lighting is dramatic, with highlights and shadows that emphasize the three-dimensional quality of the lines.

# High-level results by geography





## Ranking by country/region

We ranked each of the 929 companies in our analysis based on their score for each of the three indices: Early-stage Partnering, Drug Development, and Maturity. We then grouped the companies according to the country/region of their primary headquarters location, and averaged the three index totals for each of the major APAC regions (Australia, Mainland China, India, Japan and South Korea). The remaining regions were combined into “Other.”

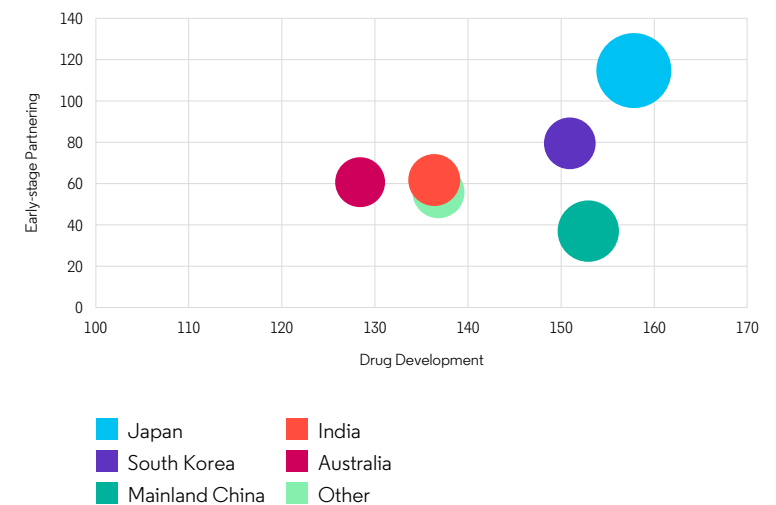
**Japan** earned the best composite score, having achieved high scores on all three indices. With its long heritage of an innovative industry and the existence of many highly successful multi-national companies, the country stands out most especially on the maturity scale.

**South Korea** is a strong challenger to Japan’s dominance, lagging Japan only slightly in terms of Drug Development and Early-stage Partnering, both of which have benefited from the government’s biotech initiatives. The country’s low Maturity score indicates that it has yet to realize the full potential of its robust research infrastructure – a situation that recently-announced investments in, for example, the regulatory process or predictors of clinical trial efficacy, are designed to change.

The other APAC countries/regions, while relatively strong in Drug Development, are weaker in Early-stage Partnering. In both Mainland China and India, much of Drug Development is focused on generics, so academic partnerships and publications play a less important role.

Mainland China’s historical difficulties in enforcing copyright infringement also influence its score in Early-stage Partnering, although legislative changes seek to rectify this.

All companies by country/region (average)



The three major innovation indices are indicated here: **Drug Development** on the horizontal axis, **Early-stage Partnering** on the vertical axis, and **Maturity** in the size of each bubble. “Other” includes Hong Kong, Indonesia, Malaysia, New Zealand, The Philippines, Singapore, Taiwan, Thailand, and Vietnam.

Source: Cortellis Competitive Intelligence,™ Derwent World Patents Index,™ Derwent Patent Citation Index,™ Web of Science™



# Company-level results



## Top-tier companies

In our analysis, we separated out the larger, more established companies – for our purposes, defined as those that have launched 10 or more products. This included many multi-national companies. We labeled this grouping as “top-tier” companies.

The tables on the following pages list those companies in rank order according to their total innovation score. All of the 41 top-tier companies scored high across the three indices (Early-stage Partnering, Drug Development, and Maturity). Their total innovation scores reflect high values on all parameters, a result that is in line with what we would expect of successful companies (assuming that our measurement parameters were appropriate).

The index on which these top-tier companies scored the lowest (Early-stage Partnering) suggests that there is room for these mature companies to foster closer ties with academic institutions.





## Top-tier companies

### Rank 1-18

| Rank | Company                                      | Country/<br>Region HQ | Major Pharma<br>(Top 50 by global revenue) | Early-stage<br>Partnering | Drug<br>Development | Maturity | Total Score |
|------|--|-----------------------|--|---------------------------|---------------------|----------|-------------|
| 1    | Daiichi Sankyo Co Ltd                        | Japan                 | ✓  | 410                       | 320                 | 135      | 865         |
| 2    | Takeda Pharmaceutical Co Ltd                 | Japan                 | ✓  | 395                       | 320                 | 135      | 850         |
| 3    | Eisai Co Ltd                                 | Japan                 | ✓  | 350                       | 320                 | 135      | 805         |
| 4    | Astellas Pharma Inc                          | Japan                 | ✓  | 345                       | 320                 | 135      | 800         |
| 5    | Otsuka Holdings Co Ltd                       | Japan                 | ✓  | 325                       | 315                 | 135      | 775         |
| 6    | Shionogi & Co Ltd                            | Japan                 | ✓  | 320                       | 315                 | 125      | 760         |
| 6    | CSL Ltd                                      | Australia             | ✓  | 345                       | 310                 | 105      | 760         |
| 8    | Ono Pharmaceutical Co Ltd                    | Japan                 | ✓  | 320                       | 310                 | 125      | 755         |
| 9    | Mitsubishi Chemical Holdings Corp            | Japan                 | ✓ (Mitsubishi Tanabe)                      | 300                       | 315                 | 125      | 740         |
| 9    | Kirin Holdings Co Ltd                        | Japan                 | ✓ (Kyowa Hakko Kirin)                      | 315                       | 300                 | 125      | 740         |
| 11   | Hanmi Pharmaceutical Co Ltd                  | South Korea           |  | 325                       | 295                 | 115      | 735         |
| 12   | Daewoong Pharmaceutical Co Ltd               | South Korea           |  | 305                       | 300                 | 95       | 700         |
| 13   | Sumitomo Chemical Co Ltd                     | Japan                 | ✓  | 265                       | 305                 | 125      | 695         |
| 14   | FUJIFILM Holdings Corp                       | Japan                 |  | 265                       | 300                 | 125      | 690         |
| 15   | Kyorin Holdings Inc                          | Japan                 |  | 280                       | 280                 | 105      | 665         |
| 16   | Teijin Ltd                                   | Japan                 |  | 250                       | 275                 | 115      | 640         |
| 17   | Japan Tobacco Ltd                            | Japan                 |  | 230                       | 260                 | 115      | 605         |
| 18   | Lupin Ltd                                    | India                 | ✓  | 185                       | 280                 | 125      | 590         |
| 18   | Maruho Co Ltd                                | Japan                 |  | 200                       | 265                 | 125      | 590         |
| 18   | Shanghai Fosun Pharmaceutical (Group) Co Ltd | Mainland China        |  | 175                       | 305                 | 110      | 590         |

Note: Scores do not reflect recent changes in company ownership, e.g., divestiture of CJ Healthcare to Korea Kolmar Holdings in 2018. Korea Kolmar was excluded from the cohort because it was focused on cosmetics and health supplements prior to the acquisition.

Source: Cortellis Competitive Intelligence, Derwent World Patents Index, Derwent Patent Citation Index, Web of Science





# Top-tier companies

## Rank 21-41

| Rank | Company                            | Country/<br>Region HQ | Major Pharma<br>(Top 50 by global revenue) | Early-stage<br>Partnering | Drug<br>Development | Maturity | Total Score |
|------|------------------------------------|-----------------------|--|---------------------------|---------------------|----------|-------------|
| 21   | Santen Pharmaceutical Co Ltd       | Japan                 |  | 205                       | 265                 | 115      | 585         |
| 22   | Meiji Holdings Co Ltd              | Japan                 |  | 155                       | 300                 | 125      | 580         |
| 22   | Handok Inc                         | South Korea           |  | 225                       | 265                 | 90       | 580         |
| 24   | SK Group                           | South Korea           |  | 180                       | 270                 | 115      | 565         |
| 25   | Asahi Kasei Corp                   | Japan                 |  | 190                       | 255                 | 115      | 560         |
| 26   | LG Chem Ltd                        | South Korea           |  | 170                       | 290                 | 95       | 555         |
| 27   | Taisho Pharmaceutical Co Ltd       | Japan                 |  | 170                       | 265                 | 105      | 540         |
| 27   | Nippon Shinyaku Co Ltd             | Japan                 |  | 215                       | 250                 | 75       | 540         |
| 29   | Yuhan Corp                         | South Korea           |  | 145                       | 290                 | 100      | 535         |
| 29   | GC Pharma                          | South Korea           |  | 165                       | 285                 | 85       | 535         |
| 29   | Chong Kun Dang Pharmaceutical Corp | South Korea           |  | 140                       | 285                 | 110      | 535         |
| 32   | Zydus-Cadila Group                 | India                 |  | 125                       | 280                 | 105      | 510         |
| 33   | Kissei Pharmaceutical Co Ltd       | Japan                 |  | 150                       | 255                 | 95       | 500         |
| 34   | Kaken Pharmaceutical Co Ltd        | Japan                 |  | 165                       | 245                 | 85       | 495         |
| 35   | Boryung Pharm Co Ltd               | South Korea           |  | 130                       | 270                 | 85       | 485         |
| 36   | Reliance Life Sciences Group       | India                 |  | 195                       | 235                 | 45       | 475         |
| 37   | Ahn-Gook Pharmaceutical Co Ltd     | South Korea           |  | 180                       | 255                 | 30       | 465         |
| 38   | Il Dong Pharmaceutical Co Ltd      | South Korea           |  | 135                       | 240                 | 80       | 455         |
| 39   | Bharat Biotech International Ltd   | India                 |  | 150                       | 205                 | 60       | 415         |
| 40   | Nippon Kayaku Co Ltd               | Japan                 |  | 115                       | 205                 | 90       | 410         |
| 41   | CJ Corp                            | South Korea           |  | 140                       | 75                  | 80       | 295         |

Note: Scores do not reflect recent changes in company ownership, e.g., divestiture of CJ Healthcare to Korea Kolmar Holdings in 2018. Korea Kolmar was excluded from the cohort because it was focused on cosmetics and health supplements prior to the acquisition.

Source: Cortellis Competitive Intelligence, Derwent World Patents Index, Derwent Patent Citation Index, Web of Science



## Key findings

We can make a few interesting observations based on the list of top-tier companies:

### **There is a link between high innovation scores and revenue**

All of the companies in the upper quartile of innovation scores fall within the top 50 global biopharmaceutical companies in terms of revenue.

### **Japanese companies dominate**

More than half of the top-tier companies are Japanese, and only one non-Japanese company (CSL Ltd from Australia) is among the top 10 based on its total innovation score.

### **Mainland China is underrepresented – for now**

Only one Mainland Chinese company appears among the top tier innovative companies in APAC, even though there were more Mainland Chinese companies in our sample than from any other country/region. The high volume of Mainland Chinese companies is largely attributable to the general growth in China since it joined the World Trade Organization (WTO) in 2001, but its comparatively low innovation index scores are a vestige of its historically state-owned, domestically-focused industry.





## Small and medium-sized enterprises

We considered those companies with fewer than 10 marketed products to be “Small and Medium-sized Enterprises” (SMEs). The table on the following page lists the top 20 SMEs in rank order by their total innovation score (full table of top 100 on [page 50](#)).

The correlation between each of the three indices and the total innovation score is less pronounced for this tier, particularly in the Maturity index. This is not unexpected, since many of the companies on the list score high on the other measures of innovation but have not yet realized their potential in terms of bringing products to market and/or expanding internationally.

It is noteworthy that Mainland Chinese companies figure most prominently in this list; more than a quarter (30%) of the top quartile are headquartered in Mainland China, compared to 21% in Japan, 16% in South Korea and 15% in Australia.





## Small and medium-sized enterprises\*

\*Top 20 shown – full table of top 100 on [page 50](#)

| Rank | Company                                  | Country/<br>Region HQ | Early-stage<br>Partnering | Drug<br>Development | Maturity | Total Score |
|------|--|-----------------------|---------------------------|---------------------|----------|-------------|
| 1    | Lee's Pharmaceutical Holdings Ltd        | Hong Kong             | 295                       | 270                 | 115      | 680         |
| 2    | Takara Holdings Inc                      | Japan                 | 325                       | 250                 | 90       | 665         |
| 3    | Jiangsu Hengrui Medicine Co Ltd          | Mainland China        | 215                       | 300                 | 110      | 625         |
| 4    | BeiGene Co Ltd                           | Mainland China        | 210                       | 255                 | 110      | 575         |
| 5    | Nitto Denko Corp                         | Japan                 | 260                       | 215                 | 90       | 565         |
| 5    | Glenmark Pharmaceuticals Ltd             | India                 | 205                       | 260                 | 100      | 565         |
| 7    | Betta Pharma Inc                         | Mainland China        | 200                       | 265                 | 90       | 555         |
| 8    | CanSino Biologics Inc                    | Mainland China        | 215                       | 235                 | 100      | 550         |
| 9    | JCR Pharmaceuticals Co Ltd               | Japan                 | 180                       | 250                 | 110      | 540         |
| 10   | Genexine Co Ltd                          | South Korea           | 215                       | 240                 | 80       | 535         |
| 11   | Hutchison Medipharma Enterprises Ltd     | Mainland China        | 190                       | 220                 | 100      | 510         |
| 11   | Nobelpharma Co Ltd                       | Japan                 | 140                       | 245                 | 125      | 510         |
| 13   | Senju Pharmaceutical Co Ltd              | Japan                 | 180                       | 265                 | 50       | 495         |
| 13   | Jiangsu Nhwa Pharmaceutical Group Co Ltd | Mainland China        | 195                       | 220                 | 80       | 495         |
| 15   | Huons Co Ltd                             | South Korea           | 200                       | 240                 | 50       | 490         |
| 15   | Luye Pharma Group Ltd                    | Mainland China        | 145                       | 270                 | 75       | 490         |
| 17   | Humanwell Healthcare (Group) Co Ltd      | Mainland China        | 145                       | 250                 | 90       | 485         |
| 17   | Sihuan Pharmaceutical Holdings Co Ltd    | Mainland China        | 130                       | 265                 | 90       | 485         |
| 17   | China Pharma Holdings Inc                | Mainland China        | 115                       | 270                 | 100      | 485         |
| 20   | AnGes MG Inc                             | Japan                 | 170                       | 225                 | 80       | 475         |
| 20   | Yakult Honsha Co Ltd                     | Japan                 | 230                       | 195                 | 50       | 475         |

Note: Innovative drug development is a high-risk endeavor; a high score in our analysis is not a guarantee of success. For this reason, it is possible that a company's position or inclusion on our list may have changed after this report was initially published.

Source: Cortellis Competitive Intelligence, Derwent World Patents Index, Derwent Patent Citation Index, Web of Science



# In-depth analysis of small and mid-sized enterprises



## Benchmarking the small and mid-size companies

We selected a company to use as a benchmark against which we could compare the 10 highest ranking SMEs. For this we selected BeiGene, a Chinese biotech company, because its innovation score was above the trendline for all three indices.\*

BeiGene is focused on molecularly targeted and immuno-oncology candidates to treat cancer. It was the first Chinese biotech to go public on the NASDAQ (in 2016) and achieved product sales of US\$130M in 2018.

The company scored particularly well in Drug Development and Maturity. It is developing a portfolio of self-originated, innovative products against novel oncology targets and has global ambitions. BeiGene also has partnerships/collaborations with several Canada- or US-based companies (e.g., Celgene, Zymeworks, Mirati Therapeutics, Ambrx and BioAtla) that are focused on cutting-edge therapies, such as bi-specific antibodies and antibody-drug conjugates, for cancer and other serious diseases.

## Top Ten SMEs

1. Lee's Pharmaceutical Holdings, Ltd.
2. Takara Holdings, Inc.
3. Jiangsu Hengrui Medicine Co, Ltd.
4. **BeiGene Company, Ltd.**
5. Nitto Denko Corp.
6. Glenmark Pharmaceuticals, Ltd.
7. Betta Pharma Inc.
8. CanSino Biologics
9. JCR Pharmaceuticals Company, Ltd.
10. Genexine Co, Ltd.

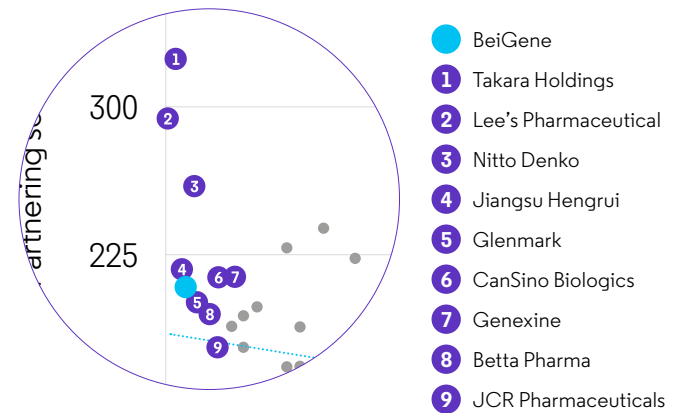
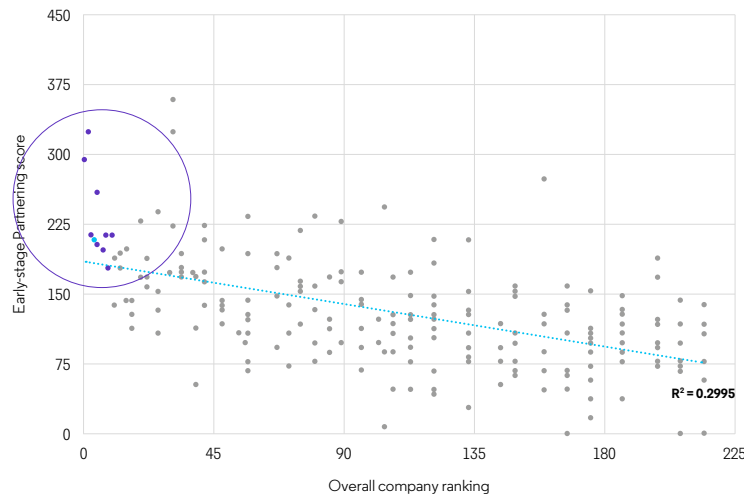


# Distribution of the top SMEs in Early-stage Partnering

**BeiGene**, our benchmark company, is represented by the blue dot in this scatter chart.

With just one exception – JCR Pharmaceuticals – the top-ranked SMEs score particularly high on Early-stage Partnering. This suggests that the elements in this index are integral to innovation.

We also see a greater range of scores in this index, with a select few companies (such as Takara Holdings, Inc.) scoring higher than many of the top-tier companies.





## **A sample top-scoring SME in Early-stage Partnering**

To characterize the top 10 SME companies with respect to Early-stage Partnering, we profiled the top scorer on this dimension.

Takara Holdings is a Japanese holding company that owes its position in our rankings to its Takara Bio subsidiary. Takara Bio began as an offshoot of the Takara Shuzo beverage company in the late 1960s and expanded over the next 50 years to produce a range of biological products. It established a US presence in 2005 with the acquisition of Clontech Laboratories, and two further US acquisitions (Rubicon Genomics and WaferGen BioSystems) were made in 2017.

Takara Bio's gene therapy business is focused on developing and commercializing gene therapies for cancer and other indications, and its three early-stage clinical programs are the subject of a collaboration with Otsuka. The company also has several research collaborations with various academic groups and hospitals.



### **Takara scored points for:**

- The volume and high impact of publications with academics (measured by citations)
- Collaboration in publishing with international groups
- Highly-cited patent applications made jointly with universities
- The large number of patents filed in the US, EU, Japan or Mainland China

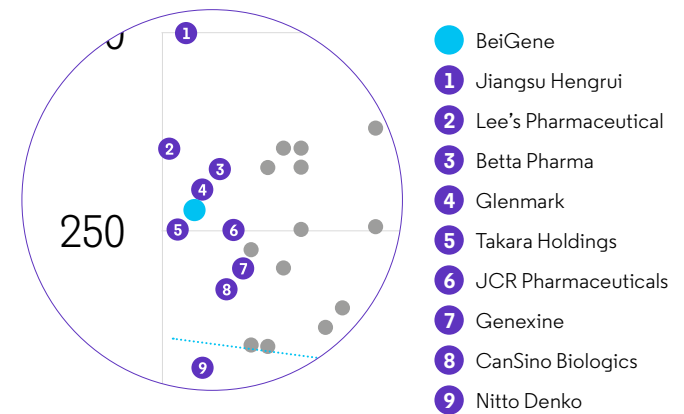
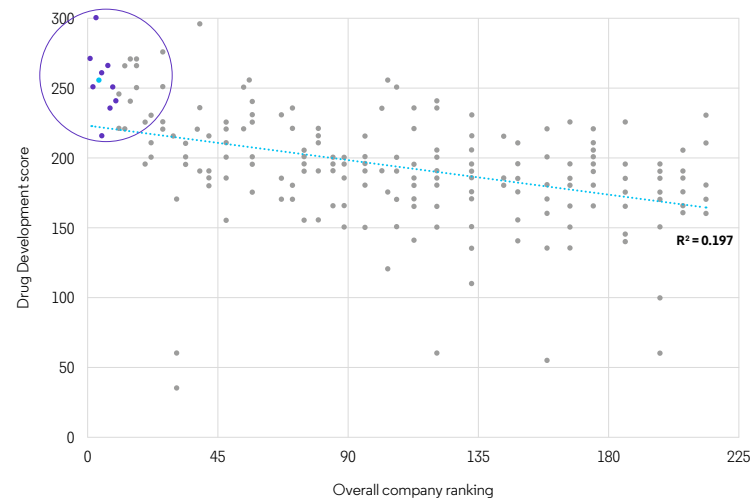




# Distribution of the top SMEs in Drug Development

Most of the top 10 SMEs earned high scores for Drug Development, with only one, Nitto Denko, falling below the trendline. Jiangsu Hengrui Medicine has the highest score on this index.

It is worth noting that some companies with an overall lower ranking scored relatively highly on Drug Development. A possible explanation for this is that while they may have large active drug portfolios, their focus is mainly on “me-too” products or generics. (Again, **BeiGene** is depicted by the blue dot.)





## **A sample top-scoring SME in Drug Development**

We again look at an exemplary company in this category to understand the basis for the scoring. Mainland China's Jiangsu Hengrui Medicine is the top scorer in this category.

Hengrui was established in 1970 and listed on the Shanghai Stock Exchange in 2000. It has a market capitalization of more than US\$30 billion, and, in 2018, was listed in Forbes' top 100 world's most innovative companies. The company has an extensive pharmaceutical pipeline, in which the majority of projects have advanced in development within the last five years. The company's portfolio also includes a number of recent product launches.



### **Hengrui scored points for:**

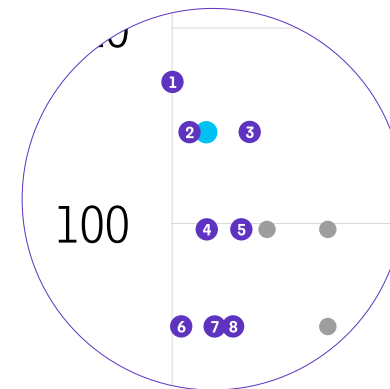
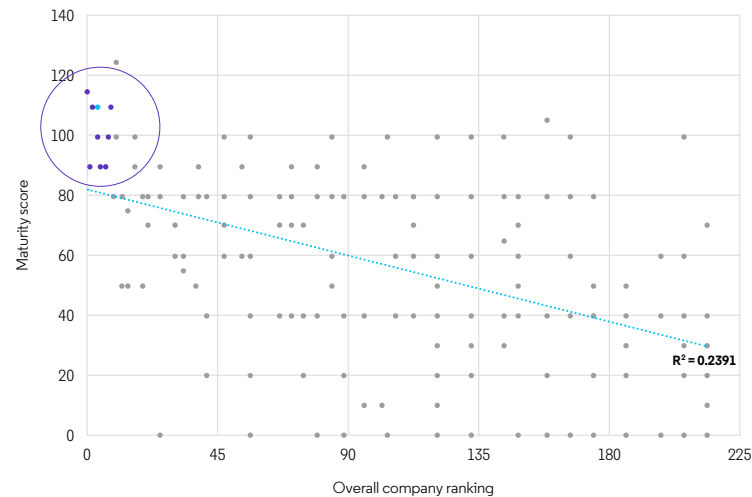
- A robust R&D pipeline of 60+ active programs
- Its clinical programs, particularly its self-originated programs
- The number of deals executed: 11 in-licensing deals and 9 sell deals



# Distribution of the top SMEs in Maturity

Here, we see considerably greater variability between the Maturity index and the overall composite score, although all 10 companies land above the trendline.

Nobelpharma, although outside the top 10 SMEs, ranks highest in this index because of its strong portfolio of recently launched products. This has been achieved through a successful clinical stage in-licensing strategy; the company has no original research efforts and therefore scored lower on the other indices. (Again, the blue dot represents our benchmark company, **BeiGene**.)



- BeiGene
- 1 Lee's Pharmaceutical
- 2 Jiangsu Hengrui
- 3 JCR Pharmaceuticals
- 4 Glenmark
- 5 CanSino Biologics
- 6 Takara Holdings
- 7 Nitto Denko
- 8 Betta Pharma



## **A sample top-scoring SME in Maturity**

Through a profile of Lee's Pharmaceutical, the highest ranking company overall and the second highest scorer in this index, we can better appreciate the characteristics that contribute to a high score based on Maturity.

Lee's Pharm is a fully integrated public company headquartered in Hong Kong. It has a broad therapeutic focus and a mix of internal R&D work and in-licensed programs. In 2018, the company spent 25.5% of sales on R&D, which is in line with the leading major global pharmaceutical companies.



### **Lee's Pharm scored points for:**

- The number of recently launched products
- Having products approved in one or more of the major international regions
- A high percentage of its deal-making in major international regions

Note: Updates to the company's product launches since our research was conducted would push Lee's Pharm into the top-tier ranking, with greater than 10 marketed products.



# Outlook for Mainland China, Japan and South Korea



## Outlook for innovation in Mainland China

Although there will be continued pressure on healthcare spending due to the economic slowdown brought about by trade tensions with the US and the rapidly aging population (exacerbated by the one-child policy), the future for R&D in Mainland China looks promising. Mainland Chinese companies are gaining a more even footing with their Western counterparts. We foresee that:



Continuing regulatory reforms aimed at reducing drug approval times will increase the number of innovative drugs introduced by Chinese companies. The number of new drugs coming out of Mainland China is expected to increase approximately 33% per year and to account for 16% of the global market in five years.<sup>11</sup> (Currently, however, the government's oversight capabilities, though strengthened, have not been keeping pace with the growth of business. Some consumer safety concerns have arisen as some companies have cut corners.)



Western-based multi-national companies will likely also benefit from these reforms and be encouraged to invest more in the region to perform more of their own development in Mainland China. If this comes to pass, local Chinese companies may be less compelled to find Western partners who can bring in development-stage assets.



Mainland China's heavy investment in cancer cell therapies should pay dividends in terms of new product launches. Today, almost half of Mainland China's immuno-oncology programs are cell therapies, which is quite a contrast to the focus in the US and EU, where cell therapies make up only 25% and 12% of immuno-therapy approaches, respectively. However, an influx of Chinese immuno-oncology therapies into the market could dampen global prices.



Efforts such as the new tendering process being piloted could bring about consolidation within the more traditional generics businesses.



Improvement in intellectual property protection is expected to be slow, which will suppress interest from potential partners in early-stage deal-making. Interest on Mainland China's part in seeking early-stage partners might also decline as young professionals find more domestic entrepreneurial opportunities, reducing their appetite for scientific experiences in the West.



## Outlook for innovation in Japan

We expect that in the future, the ranking scores for companies in Japan will differ more widely by company size. We reason that:



We may see a growing divide develop between top-tier companies and SMEs. To date, top-tier companies, mainly because of their global coverage, have escaped the full effect of local market pressures, while SMEs have been more severely affected – to the point where some may be driven out of business entirely.



It is possible that multi-national companies may de-prioritize investment in Japan, given the fact that they have seen their sales growth in the country slow or decline in recent years. There may also be a drop in the country's scores for Early-stage Partnering and Drug Development.



Cancer will remain a growth market in Japan. It is the number-one cause of death in the country, and Japanese regulators have been closing the gap between approval times in Japan and the West. On the downside however, the country will ultimately experience the same price containment pressures as other countries/regions.



## Outlook for innovation in South Korea

The outlook for innovation within South Korea is largely positive, thanks to the government's incentives designed to encourage foreign investment, which already appear to be working. Earlier this year, AstraZeneca announced that it would spend US\$630 million on R&D in South Korea over the next five years. These incentives should also boost innovative R&D productivity within South Korea, sending Drug Development scores higher.

Executing drug development deals with large, experienced Western partners is an important component of South Korean drug companies' strategy, driven by the need to expand beyond the comparatively small domestic market. We see this trend continuing; it is exemplified by the recent deal between Boehringer Ingelheim (BI) and South Korea's Yuhan. BI will license a biologic to treat nonalcoholic steatohepatitis (NASH) for US\$40 million up front, plus an additional potential US\$830 million in milestone payments.<sup>12</sup>

Such deals do not always have the desired outcome, however. The same week that BI announced this deal, J&J returned rights to Hanmi for a diabetes drug following disappointing clinical trials.<sup>13</sup> While Hanmi is still involved in other large-scale partnerships, this setback could be indicative of an underlying lack of investment in South Korea's internal drug manufacturing capability and clinical expertise.

For South Korea to benefit fully from its R&D activity, it will need to be more successful in carrying drugs all the way through to commercialization. Initiatives such as the AI system that the government is promoting to help companies identify new targets and predict a compound's efficacy should help in this regard, eventually boosting the country's Maturity scores.





# Conclusion



## Lots of opportunity – and uncertainty

The APAC region is a rich source of innovation, but in most countries/regions – Japan being the exception – this is not translating into a strong global footprint. Currently, the world as well as local countries/regions are not fully benefiting from APAC-based companies' innovative activities.

We expect the changes that are taking place in Mainland China and South Korea to improve this, at least for certain dimensions of innovation. In Mainland China, the early-stage research and collaborative work that ultimately underpins innovative new drug development will likely be slower to develop. And even top-tier multi-national companies from all countries/regions have the potential to improve this score.

These changes also represent opportunities for Western multi-national companies; understanding the forces at work in the region will help them identify potential partnering opportunities and maximize their return on investment within the APAC region.

We look forward to repeating this analysis in future years, as we believe that there will be meaningful movement in innovation scores for APAC countries/regions and companies by then.

In the meantime, it will be useful to monitor the fate of the top scorers in the SME category, as they are all on par with BeiGene on one or more of the measured indices (Early-stage Partnering, Drug Development, and Maturity). Of interest is whether they will make investments aimed at improving their ranking against these parameters and whether they transition into the “top-tier” companies list, as Lee’s Pharmaceutical Holdings has done.



# Methodology

Our objective in this analysis was to measure the degree of innovation originating from APAC-based companies and to identify “up and coming” organizations that are worth watching. To execute this analysis, we identified all companies headquartered in the APAC region and then selected a short-list of approximately 1,000 companies that were ranked according to pre-defined measures of “innovation” or surrogates thereof.

## **STEP 1: Identify shortlist of ~1000 companies**

The SQL version of Cortellis, the suite of life science intelligence solutions from Clarivate Analytics, was used to extract company information. This initial extraction included all companies associated within the Clarivate-defined APAC countries/regions (Australia, Bangladesh, Mainland China, Hong Kong, India, Indonesia, Japan, South Korea, Malaysia, Mongolia, New Zealand, Pakistan, The Philippines, Singapore, Thailand, Taiwan, and Vietnam). It included 46,509 companies.

Three broad filters were applied to this dataset: (a) limit to “parent” companies only (to exclude subsidiaries of companies whose main headquarters is outside the APAC region), (b) limit to “remit” companies only (a flag applied by the Cortellis editorial team to denote companies considered of interest), and (c) limit to company records that had been added or updated since January 2014 (to minimize the likelihood of identifying inoperative or obsolete companies).

Following application of these filters, the number of companies was reduced to 3,132, at which point a further manual triage of this cohort was required. In order to minimize the labor-intensive nature of this task, a preliminary screen was made using the data fields available within the Cortellis download (“Category” and “First paragraph

of summary”). Companies with missing or ambiguous data were further investigated using other sources.

Companies with a primary business description in the following categories were excluded:

- Government research/agencies, academic groups and not-for-profits
- Hospitals and other healthcare services
- Contract research organizations (CROs) and service companies
- API/generic manufacturers
- Alternative medicines
- Cosmetics/beauty products
- Business services/consulting/investment companies
- Agricultural/veterinary
- Medical equipment/medical devices, diagnostics and drug delivery

Companies with no associated drugs (active or inactive) or patents were also excluded.

A resulting list of 1,032 companies was distributed to Clarivate analysts within each of the APAC countries/regions to check the validity of the data set. The final cohort for analysis consisted of 929 companies.



# Methodology

(Continued)

## STEP 2: Collect data parameters

A range of publication, patent and drug development information was collected for each short-listed company. Web of Science was used to determine publication activity; Derwent World Patents Index (DWPI) and Derwent Patent Citation Index (DPCI) for patent activity; and Cortellis Competitive Intelligence and Cortellis Deals Intelligence for pipeline and deal activity, respectively. To account for the different naming conventions employed across publications, company names retrieved from Web of Science were mapped to the appropriate company name used by Cortellis.

The following data parameters were determined as fitting with the pre-defined requirements and were used for the subsequent analysis:

From Web of Science:

- % publications with university
- Growth of publications
- Category Normalized Citation Impact
- % highly cited papers
- % funded to university
- % publication with international co-research

From DWPI and DPCI:

- % application patents with university
- Growth of patents
- Citation impact
- % international patent applications
- % IP4 patent
- % IP4 grant patent

From Cortellis:

- Number of launched drugs since 2014
- Number of active development projects (excluding launched)
- Approvals in IP4 regions – yes/no
- Description of scope of activity<sup>a</sup>
- Number of Buy deals 2014-2018<sup>b</sup>
- % IP4 Buy vs. total Buy 2014-2018<sup>c</sup>
- Number of Sell deals 2014-2018<sup>d</sup>
- % IP4 Sell vs. total Sell 2014-2018<sup>e</sup>



# Methodology

(Continued)

- Number Buy from academic groups<sup>f</sup>
- Number Sell to academic groups<sup>g</sup>
- % portfolio “progressed” 2014 onwards<sup>h</sup>
- First launches 2014 onwards – yes/no
- Company originated one or more of its drug projects – yes/no

These individual data parameters were grouped into three major indices to facilitate interpretation of the data. “Early-stage Partnering” included all the parameters related to publication and patent activity, as well as the number of “Buy” and “Sell” academic deals. “Drug Development” included the total number of active drugs in the pipeline, the percentage of these drugs that had recently progressed, whether the company had any programs in clinical development, the number of “Buy” and “Sell” deals, and whether the company had any self-originated drugs. It also included the parameter describing the overall scope of pharmaceutical activity. Finally, “Maturity” included the number of recently launched drugs, whether the company had any drugs approved in one of the IP4 regions (US, Europe, Japan or Mainland China), and the percentage of “Buy” and “Sell” deals that were with a company in one of the IP4 regions.

In addition, any company that had 10 or more launched drugs was flagged as a “Top Tier” company.

## STEP 3: Apply scores and weighting to identified parameters

A basic score was applied to each parameter’s value. For parameters with a simple “yes”/“no” delineation, a “yes” answer received a score of 1 and a “no” answer a score of 0. For parameters with a range of potential values, the scores were graded from 0 to 3, 4 or 5 (depending on the number of possible values). There was a single instance in which a parameter’s value was assigned a negative score: Companies having launched products but with no R&D pipeline were assumed to be distributors only and, therefore, would not qualify as innovative.

On top of the basic score, a weighting was applied to each parameter (5x, 10x, 15x or 20x). By experimenting with the weights, the basic score could be moderated to ensure that potentially highly innovative but less mature companies were not unjustly penalized. The resulting adjusted scores were totalled for each index and for all the indices combined, and the companies ranked accordingly.



# Methodology

(Continued)

## STEP 4: Interpret the results

The data was analyzed on the basis of region and company size. The three index totals were averaged for each of the major APAC regions (Australia, Mainland China, India, Japan and South Korea) and the remaining regions grouped together as “Other.” These average values were then plotted out, with Drug Development on the “x” axis, Early-stage Partnering on the “y” axis and Maturity represented by bubble size. ([See page 21](#))

Top Tier companies were analyzed separately to the remainder of the cohort. In each case, the correlation of each index with overall ranking was examined, and upper quartile performers and outliers identified.

For analysis of the small to medium enterprises (SMEs), BeiGene was chosen as a benchmark because of its high ranking within the cohort and its recognized prowess in the biopharmaceutical industry.

- a. A summary comment was added to each company entry. Seven categories were used:  
Launched plus active R&D; no launched drugs, but R&D pipeline; no launched drugs or pipeline, but patents (owner); no launched drugs or pipeline, but patents (third party); inactive pipeline only; no active pipeline or patents, but deals; launched drugs, but no pipeline
- b. Deals where APAC company is the listed as “Partner”
- c. IP4 Buy deals are those where APAC company is listed as “Partner” and the “Principal” company is listed as territory US, Europe, Japan or Mainland China
- d. Deals where APAC company is listed as “Principal”
- e. IP4 Sell deals are those where APAC company is listed as “Principal” and the “Partner” company is listed as territory US, Europe, Japan or Mainland China
- f. Deals where APAC company is listed as “Partner” and the “Principal” company is listed as “Academic”
- g. Deals where APAC company is listed as “Principal” and the “Partner” company is listed as “Academic”
- h. Each drug record associated with a company is analyzed to determine the year in which the last update to the project/status was made. If the date preceded 2014, it was not included as a progression. Drug records with “Discovery” as the highest current phase are assumed to have been new discovery starts in the year given.



## Key data sources

Clarivate Analytics™ is a global leader in providing trusted insights and analytics to accelerate the pace of innovation. We have built some of the most trusted brands across the innovation lifecycle, including Web of Science,™ Cortellis,™ Derwent,™ CompuMark,™ MarkMonitor,™ and Techstreet.™ Key data sources from Clarivate used in this report include:

- **Cortellis** is a suite of life science intelligence solutions that curate broad and deep sources of information to enable precise, actionable answers to specific questions across the R&D lifecycle – from discovery and clinical development through regulatory submission and commercialization. The rich Cortellis database includes intelligence on 73,000+ pipeline products, 340,000+ clinical trials, 95,000+ life sciences deals and 175,000+ company profiles, and is used by 49 of the top 50 largest pharmaceutical and biopharmaceutical companies.
- **Web of Science** is the world's most trusted publisher-independent global citation database, delivering best-in-class publication and citation data for confident discovery, access and assessment. The database includes 1.7 billion cited references from more 159 million records, and is trusted by 9,000 leading academic, corporate, and government institutions as well as millions of researchers worldwide.
- The **Derwent World Patents Index (DWPI)** is the world's most comprehensive database of enhanced patent information. DWPI provides the most extensive view of patent activity in emerging and growing markets through a collection of global patent abstracts in English from more than 62 authorities covering over 30 languages.

- The **Derwent Patent Citation Index (DPCI)** contains citations of patents and literature made throughout the patent application process. Through citation data, DPCI allows users to find patents that are closely related, or to identify patents that are highly influential in a technology space. DPCI contains more than 162 million backwards citations, 182 million forward citations and 39 million literature citations.



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# Appendix

## Top 100 SMEs



| Rank | Company                                     | Country/<br>Region HQ | Early-stage<br>Partnering | Drug<br>Development | Maturity | Total Score |
|------|---|-----------------------|---------------------------|---------------------|----------|-------------|
| 1    | Lee's Pharmaceutical Holdings Ltd           | Hong Kong             | 295                       | 270                 | 115      | 680         |
| 2    | Takara Holdings Inc                         | Japan                 | 325                       | 250                 | 90       | 665         |
| 3    | Jiangsu Hengrui Medicine Co Ltd             | Mainland China        | 215                       | 300                 | 110      | 625         |
| 4    | BeiGene Co Ltd                              | Mainland China        | 210                       | 255                 | 110      | 575         |
| 5    | Nitto Denko Corp                            | Japan                 | 260                       | 215                 | 90       | 565         |
| 5    | Glenmark Pharmaceuticals Ltd                | India                 | 205                       | 260                 | 100      | 565         |
| 7    | Betta Pharma Inc                            | Mainland China        | 200                       | 265                 | 90       | 555         |
| 8    | CanSino Biologics Inc                       | Mainland China        | 215                       | 235                 | 100      | 550         |
| 9    | JCR Pharmaceuticals Co Ltd                  | Japan                 | 180                       | 250                 | 110      | 540         |
| 10   | Genexine Co Ltd                             | South Korea           | 215                       | 240                 | 80       | 535         |
| 11   | Hutchison Medipharma Enterprises Ltd        | Mainland China        | 190                       | 220                 | 100      | 510         |
| 11   | Nobelpharma Co Ltd                          | Japan                 | 140                       | 245                 | 125      | 510         |
| 13   | Senju Pharmaceutical Co Ltd                 | Japan                 | 180                       | 265                 | 50       | 495         |
| 13   | Jiangsu Nhwa Pharmaceutical Group Co Ltd    | Mainland China        | 195                       | 220                 | 80       | 495         |
| 15   | Huons Co Ltd                                | South Korea           | 200                       | 240                 | 50       | 490         |
| 15   | Luye Pharma Group Ltd                       | Mainland China        | 145                       | 270                 | 75       | 490         |
| 17   | Humanwell Healthcare (Group) Co Ltd         | Mainland China        | 145                       | 250                 | 90       | 485         |
| 17   | Sihuan Pharmaceutical Holdings Co Ltd       | Mainland China        | 130                       | 265                 | 90       | 485         |
| 17   | China Pharma Holdings Inc                   | Mainland China        | 115                       | 270                 | 100      | 485         |
| 20   | AnGes MG Inc                                | Japan                 | 170                       | 225                 | 80       | 475         |
| 20   | Yakult Honsha Co Ltd                        | Japan                 | 230                       | 195                 | 50       | 475         |
| 22   | NanoCarrier Co Ltd                          | Japan                 | 190                       | 210                 | 70       | 470         |
| 22   | TaiRx Inc                                   | Taiwan                | 190                       | 200                 | 80       | 470         |
| 22   | Cellular Biomedicine Group Inc              | Hong Kong             | 160                       | 230                 | 80       | 470         |
| 22   | Telix Pharmaceuticals Ltd                   | Australia             | 170                       | 230                 | 70       | 470         |
| 26   | WAVE Life Sciences Ltd                      | Singapore             | 240                       | 225                 | 0        | 465         |
| 26   | Guangdong Zhongsheng Pharmaceutical Co Ltd  | Mainland China        | 135                       | 250                 | 80       | 465         |
| 26   | Sinovac Biotech Ltd                         | Mainland China        | 155                       | 220                 | 90       | 465         |
| 26   | Tasly Pharmaceutical Group Co Ltd           | Mainland China        | 110                       | 275                 | 80       | 465         |
| 30   | Nippon Chemiphar Co Ltd                     | Japan                 | 175                       | 215                 | 70       | 460         |
| 31   | Mitsubishi Corp                             | Japan                 | 325                       | 60                  | 70       | 455         |
| 31   | ToolGen Inc                                 | South Korea           | 225                       | 170                 | 60       | 455         |
| 31   | United Laboratories Inc                     | Philippines           | 360                       | 35                  | 60       | 455         |
| 34   | Nissan Chemical Corp                        | Japan                 | 175                       | 195                 | 80       | 450         |
| 34   | Genscript Biotech Co                        | Mainland China        | 170                       | 200                 | 80       | 450         |
| 34   | Sun Pharmaceutical Advanced Research Co Ltd | India                 | 195                       | 200                 | 55       | 450         |
| 34   | TaiGen Biotechnology Co Ltd                 | Taiwan                | 180                       | 210                 | 60       | 450         |
| 38   | Pharmaxis Ltd                               | Australia             | 175                       | 220                 | 50       | 445         |
| 39   | Huadong Medicine Co Ltd                     | Mainland China        | 115                       | 235                 | 90       | 440         |
| 39   | BrightPath Biotherapeutics Co Ltd           | Japan                 | 170                       | 190                 | 80       | 440         |
| 39   | Sino Biopharmaceutical Ltd                  | Hong Kong             | 55                        | 295                 | 90       | 440         |
| 42   | Mesoblast Ltd                               | Australia             | 165                       | 190                 | 80       | 435         |
| 42   | PRISM Pharma Co Ltd                         | Japan                 | 175                       | 180                 | 80       | 435         |
| 42   | NEC Corp                                    | Japan                 | 210                       | 185                 | 40       | 435         |
| 42   | Oncolys BioPharma Inc                       | Japan                 | 140                       | 215                 | 80       | 435         |
| 42   | KinoPharma Inc                              | Japan                 | 175                       | 180                 | 80       | 435         |
| 42   | EnGeneC Ltd                                 | Australia             | 225                       | 190                 | 20       | 435         |
| 48   | Ajinomoto Co Inc                            | Japan                 | 140                       | 185                 | 100      | 425         |
| 48   | Benitec Biopharma Ltd                       | Australia             | 135                       | 210                 | 80       | 425         |
| 48   | Chiome Bioscience Inc                       | Japan                 | 200                       | 155                 | 70       | 425         |

| Rank | Company   | Country/<br>Region HQ | Early-stage<br>Partnering | Drug<br>Development | Maturity | Total Score |
|------|---|-----------------------|---------------------------|---------------------|----------|-------------|
| 48   | Jubilant Life Sciences Ltd  | India                 | 120                       | 225                 | 80       | 425         |
| 48   | Helixmith Co Ltd (ViroMed)  | South Korea           | 145                       | 220                 | 60       | 425         |
| 48   | Ascentage Pharma Group Corporation Ltd                            | Mainland China        | 145                       | 200                 | 80       | 425         |
| 54   | Simcere Pharmaceutical Group                                      | Mainland China        | 110                       | 220                 | 90       | 420         |
| 54   | HEC Pharm Co Ltd  | Mainland China        | 110                       | 250                 | 60       | 420         |
| 56   | Qilu Pharmaceutical Co Ltd  | Mainland China        | 100                       | 255                 | 60       | 415         |
| 57   | Medy-Tox Inc  | South Korea           | 145                       | 225                 | 40       | 410         |
| 57   | Harbour BioMed  | Mainland China        | 130                       | 200                 | 80       | 410         |
| 57   | Paranta Biosciences Ltd   | Australia             | 235                       | 175                 | 0        | 410         |
| 57   | Innovent Biologics Inc  | Mainland China        | 80                        | 230                 | 100      | 410         |
| 57   | CanBas Co Ltd   | Japan                 | 130                       | 200                 | 80       | 410         |
| 57   | Medigen Biotechnology Corp  | Taiwan                | 195                       | 195                 | 20       | 410         |
| 57   | Ribomic Inc   | Japan                 | 130                       | 200                 | 80       | 410         |
| 57   | Cadila Pharmaceuticals Ltd  | India                 | 125                       | 225                 | 60       | 410         |
| 57   | Adimmune Corp   | Taiwan                | 110                       | 200                 | 100      | 410         |
| 57   | Jiangsu Hansoh Pharmaceutical Group Co Ltd                        | Mainland China        | 70                        | 240                 | 100      | 410         |
| 67   | Immuteq Ltd   | Australia             | 150                       | 185                 | 70       | 405         |
| 67   | Medipost Co Ltd   | South Korea           | 180                       | 185                 | 40       | 405         |
| 67   | Guangzhou Cellprotek Pharmaceutical Co Ltd                        | Mainland China        | 195                       | 170                 | 40       | 405         |
| 67   | HitGen Ltd  | Mainland China        | 95                        | 230                 | 80       | 405         |
| 71   | Kubota Pharmaceutical Holdings Co Ltd                             | Japan                 | 190                       | 170                 | 40       | 400         |
| 71   | Wockhardt Ltd   | India                 | 110                       | 220                 | 70       | 400         |
| 71   | Idac Theranostics Inc   | Japan                 | 140                       | 180                 | 80       | 400         |
| 71   | Jiangsu Aosaikang Pharmaceutical Co Ltd                           | Mainland China        | 75                        | 235                 | 90       | 400         |
| 75   | Incozen Therapeutics Pvt Ltd                                      | India                 | 220                       | 155                 | 20       | 395         |
| 75   | Suzhou Ribo Life Science Co Ltd                                   | Mainland China        | 160                       | 195                 | 40       | 395         |
| 75   | Patrys Ltd  | Australia             | 165                       | 190                 | 40       | 395         |
| 75   | Cynata Therapeutics Ltd   | Australia             | 120                       | 205                 | 70       | 395         |
| 75   | Bioleaders Corp   | South Korea           | 155                       | 200                 | 40       | 395         |
| 80   | Guangzhou Kang Rui Biological<br>Pharmaceutical Technology Co Ltd | Mainland China        | 235                       | 155                 | 0        | 390         |
| 80   | GeneOne Life Science Inc  | South Korea           | 160                       | 190                 | 40       | 390         |
| 80   | Beijing SL Pharmaceutical Co Ltd                                  | Mainland China        | 80                        | 220                 | 90       | 390         |
| 80   | Carsgen Therapeutics Ltd  | Mainland China        | 135                       | 215                 | 40       | 390         |
| 80   | Imugene Ltd   | Australia             | 100                       | 210                 | 80       | 390         |
| 85   | Curadev Pharma Pvt Ltd  | India                 | 115                       | 190                 | 80       | 385         |
| 85   | Bionomics Ltd   | Australia             | 125                       | 200                 | 60       | 385         |
| 85   | Guangxi Wuzhou Zhongheng Group Co Ltd                             | Mainland China        | 170                       | 165                 | 50       | 385         |
| 85   | Frontier Biotechnologies Co Ltd                                   | Mainland China        | 90                        | 195                 | 100      | 385         |
| 89   | CoDa Therapeutics Inc (NZ)  | New Zealand           | 230                       | 150                 | 0        | 380         |
| 89   | Phylogica Ltd   | Australia             | 165                       | 195                 | 20       | 380         |
| 89   | Tella Inc   | Japan                 | 175                       | 165                 | 40       | 380         |
| 89   | Vaxine Pty Ltd  | Australia             | 175                       | 185                 | 20       | 380         |
| 89   | Delta-Fly Pharma Inc  | Japan                 | 100                       | 200                 | 80       | 380         |
| 89   | Mabworks Biotech Co Ltd   | Mainland China        | 100                       | 200                 | 80       | 380         |
| 89   | PersonGen Biomedicine (Suzhou) Co Ltd                             | Mainland China        | 100                       | 200                 | 80       | 380         |
| 96   | Kazia Therapeutics Ltd  | Australia             | 140                       | 195                 | 40       | 375         |
| 96   | Epimab Biotherapeutics Inc  | Mainland China        | 115                       | 180                 | 80       | 375         |
| 96   | J-Pharma Co Ltd   | Japan                 | 145                       | 150                 | 80       | 375         |
| 96   | Magpie Pharmaceuticals Co Ltd                                     | Mainland China        | 95                        | 200                 | 80       | 375         |
| 96   | Yuyu Inc  | South Korea           | 175                       | 190                 | 10       | 375         |



## About Cortellis

Cortellis, a suite of life science intelligence solutions from Clarivate Analytics, enables precise, actionable answers to specific questions across the R&D lifecycle – from discovery and clinical development through regulatory submission and commercialization. By supporting data-driven decisions, Cortellis helps pharmaceutical companies, biotech and medical device/diagnostic firms give life to science by unlocking the hidden insights in data.

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