SECTION 01

SHENZHEN: THE FIRST FOUR DECADES
Shenzhen Then and Now

Shenzhen 1979

Shenzhen 2020

“There was an old man/Who drew a circle/by the South China Sea.”

- “The Story of Spring,” Patriotic Chinese song
Where is Shenzhen?

- On the Southern tip of Central China
- In the south of Guangdong Province
- North of Hong Kong
- Along the East Bank of the Pearl River
Shenzhen: Growth and Development

• **1979:** Shenzhen officially became a City; following the administrative boundaries of Bao’an County.

• **1980:** Shenzhen established as China’s first Special Economic Zone (SEZ).
  – Separated into two territories, Shenzhen SEZ to the south, Shenzhen Bao-an County to the North.
  – Initially, SEZs were separated from China by secondary military patrolled borders.

• **2010:** Chinese State Council dissolved the “second line”; expanded Shenzhen SEZ to include all districts.

• **2010:** Shenzhen Stock Exchange founded.

• **2019:** The Central Government announced plans for additional reforms and an expanded SEZ.
Shenzhen’s Special Economic Zone (2010)

2010: Shenzhen SEZ expanded to include all districts.
Regulations of the Special Economic Zone

- Created an experimental ground for the practice of market capitalism within a community guided by the ideals of “socialism with Chinese characteristics.”

- Preferential policies to attract foreign investment:
  - Business autonomy
  - Taxation
  - Land use
  - Foreign exchange management
  - Product sales
  - Entry and exit management
Defining Shenzhen

• “China’s Instant City”
• “The World’s Factory”
• “China’s Silicon Valley”
• “The Electronics Capital of the World”
“The Instant City” - Cityscape

• “The world leader for completing new skyscrapers” (The Guardian)

• Ranked third in the number of buildings above 150 meters
  – Behind Hong Kong, New York City
  – 223 completed as of July 2019

• The Ping An Finance Centre
  – 599 meters, 115 floors
"The Instant City" - Population

• **12,905,000**: Registered population as of 2017
  – With an area of 1,997.47 square kilometers, Shenzhen has a density of 7,317 people in every square kilometer

• **20 million**: Includes short-term residents, unregistered migrants, part-time residents, commuters, visitors, temporary residents

• **108.5 million**: Pearl River Delta Metropolitan region
MEDIAN AGE:
28.65

COMPARED WITH:
• China: 38.4
• U.S.: 38.2
Shenzhen Age Distribution

**SHENZHEN PERCENTAGE BY AGE GROUP:**

- 0-14: 8.5%
- 15-64: 90.39%
- 65+: 1.11%

**COMPAARED WITH CHINA GENERALLY:**

- 0-14: 38.4%
- 15-64: 71.2%
- 65+: 11.9%
"The Instant City" – Entrepreneurship

- **16.04%** of population reported nascent or new entrepreneurial activities
- **240** commercial entities and **150** enterprises per 1,000 people

<table>
<thead>
<tr>
<th>Participating Economy</th>
<th>Nascent Entrepreneurial Activity - %</th>
<th>New Entrepreneurial Activity - %</th>
<th>Total Early Stage Entrepreneurial Activity - %</th>
<th>Established Business Owners - %</th>
<th>Overall Entrepreneurial Activity - %</th>
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<tbody>
<tr>
<td>Hong Kong</td>
<td>4.99%</td>
<td>4.66%</td>
<td>9.44%</td>
<td>6.12%</td>
<td>15.30%</td>
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<td>9.98%</td>
<td>16.04%</td>
<td>7.82%</td>
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<td>China</td>
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<td>10.29%</td>
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<td>4.45%</td>
<td>11.31%</td>
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<td>South Korea</td>
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<td>Chinese Taipei</td>
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<td>8.24%</td>
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<td>United Kingdom</td>
<td>5.16%</td>
<td>3.73%</td>
<td>8.80%</td>
<td>6.05%</td>
<td>14.57%</td>
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<tr>
<td>United States</td>
<td>8.88%</td>
<td>4.00%</td>
<td>12.63%</td>
<td>9.22%</td>
<td>20.99%</td>
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<tr>
<td>Efficiency-driven economies (mean)</td>
<td>7.95%</td>
<td>6.53%</td>
<td>14.16%</td>
<td>8.61%</td>
<td>22.25%</td>
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<tr>
<td>Innovation-driven economies (mean)</td>
<td>5.59%</td>
<td>3.68%</td>
<td>9.07%</td>
<td>6.68%</td>
<td>15.37%</td>
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</tbody>
</table>

Source: Global Entrepreneurship Monitor- Hong Kong and Shenzhen Report
“The Instant City” – Dramatic Growth

- Lonely Planet, “Top 10 cities to visit in 2019”
- Shenzhen Symphony Orchestra
- Shenzhen Cultural Center
- Shenzhen Convention and Exhibition Center
- Overseas Chinese Town – cultural theme parks
- 630 libraries and bookstores
“The Instant City” – Education

- Shenzhen University (1983)
- Shenzhen Virtual University Park (1999)
- Southern University of Science and Technology (2011)
- Shenzhen Institute of Technology (2018)
"The Instant City" – Legal System

<table>
<thead>
<tr>
<th>Metric</th>
<th>Yr. 1979</th>
<th>Yr. 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanent population</td>
<td>31,400</td>
<td>13,438,800</td>
</tr>
<tr>
<td>GDP</td>
<td>28 million USD</td>
<td>374 billion USD</td>
</tr>
<tr>
<td>GDP per capita</td>
<td>87 USD</td>
<td>29,069 USD</td>
</tr>
</tbody>
</table>

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Shenzhen’s Economic Miracle

- China’s richest city
- The third largest Chinese City, behind only Shanghai and Beijing
- Estimated GDP (2019) - $374 billion
  - Surpassed Hong Kong in 2018
  - GDP grew 7% in 2019
- By 2030, estimated to be the city making the 7th biggest contribution to global GDP
  - Ahead of London and Tokyo
- The eighth largest stock exchange in the world
SECTION 2

SHENZHEN’S IMPORTANCE TO THE GLOBAL TECHNOLOGY INDUSTRY
SECTION 2.1

SHENZHEN: ONE OF TOP GLOBAL INNOVATION HUBS
The Greater Bay Area (2017)

- **Population:** 71 million
  - UK – 66 million; Canada – 36 million
- **GDP:** $1.6 trillion
  - 12% of China GDP; about twice of SF Bay
- **Air freight traffic:** 7.96 million tons
  - > San Francisco + New York + Tokyo
- **Container ports:** 3 of world’s top 10
  - Shenzhen, Guangzhou, HK
  - 66 million TEUs, > any other bay areas

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Shenzhen: Top Global Innovation Hub – Why?

- Innovation Ecosystem
- Competitive IP Strategy
- Heavy Investment on R&D
- Rich Young-talent Pool and Entrepreneurs
- Strong Legal Protection
Innovation Ecosystem

### Key industries in Shenzhen

<table>
<thead>
<tr>
<th>Industry</th>
<th>Percentage of GDP</th>
<th>GDP (RMB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistics</td>
<td>15.67%</td>
<td>273.98 billion</td>
</tr>
<tr>
<td>Culture</td>
<td>10.58%</td>
<td>184.95 billion</td>
</tr>
<tr>
<td>High-tech</td>
<td>52.78%</td>
<td>923.09 billion</td>
</tr>
<tr>
<td>Finance</td>
<td>20.97%</td>
<td>366.76 billion</td>
</tr>
</tbody>
</table>

Source: www.newsgd.com

### High Tech

- Huawei
- BYD
- DJI
- APPOTRONICS
- Tencent
- Hytera
- OFILM
- KONKA
- KONKA
- KONKA
- Han’s Laser

### Finance

- Ping An
- Shenzhen Stock Exchange
- SHENZHEN

### Logistics

- SF Express
- First Flag
- China Express

### Culture related

- OCT
- Tencent Video
- Fantawild
Innovation Ecosystem

**Fortune 500 in Shenzhen**
- 98 Int’l Fortune 500 invested in Shenzhen
- 7 local Fortune 500 Enterprises
- 28 China Top 500

**Leaders in Niche Market**
- World’s largest printed circuit board manufacturer
- World’s largest heparin sodium API supplier
- World’s second largest provider of professional mobile radio solution
- World’s top 3 LED display screen manufacturer

LED

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Heavy Investment on R&D

US$14.9 billion investment in tech research and development
4% of Shenzhen's GDP

Competitive IP Strategies

- China takes over world leadership in international patent applications in 2019

- Top 10 PCT filers
  - 4 Chinese companies
  - 3 Shenzhen-based: Huawei, Oppo, and Ping’an

Strong Legal Protection to Innovations

- Experienced Judges and Law Officers
- Cases on Cutting Edge Technologies
- Enhanced Evidence Preservation and Production
- Allowing Mainland China, HK, and Macau Law Firms to Establish Joint Offices

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Guangdong instituted nearly 1/3 IP cases of China in 2019

Guangdong: 32.66%
157,363 Cases

Beijing: 16.64%
Zhejiang: 5.75%
Shanghai: 4.89%
Jiangsu: 4.2%
Others: 35.85%

Source: Supreme Court of China, 2019 IP Protection White Book

Shenzhen instituted nearly 1/3 IP cases of Guangdong in 2019

Shenzhen: 27%
42,660 Cases

Guangzhou IP Court: 12,896 cases
Shenzhen IP Tribunal: 3,191 cases

Others: 73%

Source: Shenzhen Intermediate Court, 2019 IP Protection White Book
Guangdong is the top 3 forum of granting preliminary injunction (PI) and assets/evidence preservation orders.

254 PI and orders were issued since 2015 in Guangdong, which constitutes 12.6% of nationwide.

Shenzhen constitutes 33.6% of Guangdong, ranking 1st.
High Efficiency Judicial System-Shenzhen IP Tribunal

**High Case-conclusion Rate:**
more cases closed than newly instituted

3,191 Instituted in 2019
3,221 Concluded in 2019

**More than 80% cases were concluded in less than 1 year**

Source: Shenzhen Intermediate Court, 2019 IP Protection White Book

Source: Wolters Kluwer
Increasing High-Amount Damage Awards in Guangdong

In 2019

- 67K USD: average damage awards in patent case, yearly increase **140.84%**
- **19 cases** with damage awards of more than **10M RMB** (1.42M USD) in Shenzhen and Guangzhou

**Representative IP Cases Awarding Big Damages**
- Guangdong High Court: *GREE v. AUX*, **14M USD** awarded in 2 patent cases
- Guangzhou IP Court: *Guangzhou Redsun v. Guangdong Zhimei*, **7M USD** awarded in a trademark and unfair competition case
- Shenzhen IP Tribunal: *Tencent v. Yingxiong Entertainment*, **6.3M USD** awarded in a game copyright case
Guangdong: China’s Top Province for IP Monetization

2018 China’s General IP Monetization Index

Int’l Trans of Copyright (US$)

Patent Licensing (10k Yuan)

Source: cnipa-ipdrc.org.cn
Types of IP Transactions: patent, trademark, copyright, geographical indications, etc.

IP Transactions on the Fair in 2019: USD 1.4 billion, up 12.74% than 2018
- Patent and trademark, up 42.61%
Huawei v. Samsung (Shenzhen Intermediate Ct. 2018)

Facts:
Huawei sued Samsung for infringement of two SEPs regarding 4G LTE in 2016 after the failure in the cross-licensing negotiations started from 2011. Huawei sought a permanent injunction.

Holding:
• Huawei’s patents are SEPs.
• Samsung infringed Huawei’s SEPs.
• Samsung maliciously delayed negotiations and was “at fault” during the negotiation. Thus, injunction is granted.

Settlement: Huawei and Samsung reached agreement during the appeal.
Determining Infringement of SEP

- Is the asserted patent a SEP?
- Does the defendant practice the standard?
  - Samsung smartphone uses 4G network.
  - China’s top 3 telecomm service provider adopts the 3GPP standard.

Determining Permanent Injunction

- Whether plaintiff complies with FRAND during the negotiations?
- Whether defendant complies with FRAND during the negotiations?
- If plaintiff has no faults and the defendant violates FRAND, a permanent injunction shall be granted.
Tencent v. Bytedance (Guangzhou IP Ct. 2019)

Facts:

- Tencent owns copyright over the online game *Honor of Kings* (or *Arena of Valor*) and organized a tournament for the game. Without authorization, Bytedance provided live-streaming of the tournament on its video-sharing platforms.

- Tencent sued Bytedance for copyright infringement and unfair competition, and claimed USD 7.18 million for damages on Feb. 15, 2019.

- On Mar. 1, Tencent sought preliminary injunction while providing a bond of USD 7.18 million.

Order:

- **Preliminary junction granted.**
  - likelihood of infringement exists
  - likelihood of irreparable harm exists
  - balance of equities tips in Tencent’s favor
  - no harm to public interest

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Tencent v. Qihoo 360 (Supreme Ct. 2013)

Facts:
Qihoo developed its software Guard which scans Tencent’s QQ instant messenger, flags the ads and other plugins in QQ as dangerous items, and prompts users to remove those plugins. Tencent sued Qihoo for unfair competition. Guangdong High Court entered judgment for Tencent and awarded USD 710k for damages. Qihoo appealed to the Supreme Court, which affirmed.

Holding:
• Guard damaged the security and integrity of QQ software.
• Removing QQ’s ads would result in Tencent losing transactions and ad income.
• Qihoo defamed Tencent.
Facts:
Anhui Newman was given criminal sentences due to misappropriation of Tianci’s trade secret. Among the criminal investigation, Tianci discovered that it is Mr. Hua and some other Tianci’s employees disclosed the trade secret to Newman, thus filed a civil litigation against the employees and Newman.

Holding:
- The defendants jointly and severally liable for infringement of trade secret.
- The court awarded punitive damages at USD 4.3 million, 2.5 times of the profits gained by the defendants.
Tencent v. wdzj.com (Shenzhen Nanshan Dist. Ct. 2020)

Facts:
• Dreamwriter is an automated news writing program (AI) based on data and algorithms developed by Tencent in 2015.
• On Aug 20, 2018, Dreamwriter wrote a financial report, which was published on the Tencent Securities website, noted that “the article was automatically written by Tencent Robot Dreamwriter.”
• Wdzj.com copied the article onto its own website.
• Tencent sued for copyright infringement.

Holding:
• The article generated by AI was original, and a copyrightable work.
• Tencent is the author since the work was the result of activities carried out on behalf of Tencent.
• Damages: 1,500 RMB

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Success Resulted in More IP Cases in U.S. Courts

- 2011-2020: about 2,000 U.S. district court IP cases involving Shenzhen companies

Source: Lex Machina, 5/15/2020
Success Resulted in More IP Cases in U.S. Courts

- 2011-2020: about 240 ITC-337 investigations involving Shenzhen companies

Source: Lex Machina, 5/15/2020
## Enforcing IP Rights in U.S. Courts

- Increasing Shenzhen companies enforce their IP rights in US courts

<table>
<thead>
<tr>
<th>Case Details</th>
<th>Status</th>
<th>Court</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hong Kong uCloudlink Network Technology Limited et al v. SIMO Holdings Inc. et al</td>
<td>Patent</td>
<td>N.D.Cal.</td>
<td>2018-08-16, 2020-03-30</td>
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</tbody>
</table>

Source: Lex Machina, 5/15/2020
Improved IP Protection and Risk Management

- Build effective IP portfolio facilitating international competition
- Responding to infringement notice & licensing request
- IP due diligence; monitor IP litigation
- Opinion of counsel
- Design around
- Licensing & cross-licensing
- Challenge validity of threatening patents at the USPTO
- Allocate IP risks through contracts
- Actively responding to IP litigation
- Effective settlement and negotiation
- Manage risks of trade secret misappropriation

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SECTION 2.2

COVID-19 INSIGHTS: CHALLENGES & OPPORTUNITIES
COVID-19 to Shenzhen: Challenges vs Opportunities

- Mainly local companies, not many foreign companies
- Complete industry chain
- High-tech hub: Low percentage of labor-intensive and low-tech assembling industries
- COVID-19 inspires new tech development
COVID-19: Opportunities

- Health IT
  - Telemedicine
  - Artificial intelligence ("AI")
  - Drones
  - Robots
  - Big data
- Online entertainment
- E-commerce & Live-streaming commerce
- Online education
- Remote-work technologies
- E-government
Where Do We Go From Here?

- Reevaluate the industry chain
- Drive new technology adoption and innovation
- Enhance technology capabilities through M&A
- Plan ahead to buffer volatility and risks
SECTION 03
SHENZHEN’S IMPORTANCE TO THE GLOBAL LIFE SCIENCES INDUSTRY
Overview

- Shenzhen’s Life Science Industry and its Significance
- Opportunities in Shenzhen
- COVID-19 and Life Science Industry
SECTION 3.1

SHENZHEN’S LIFE SCIENCE INDUSTRY AND ITS SIGNIFICANCE
China & Global Life Science Market Scales

China & Global Life Science Market Scales

Global
China (hundred million yuan)

Biopharma
Chempharma
Medical Device

19000
30000
6400

3700
10000

China & Global Life Science Compound Annual Growth Rate

Global
China

Biopharma
Chempharma
Medical Device

8.3%
5%
5%

12%
7.4%

20%

Source: Pingshan Biomedical Industry Innovation and Development Blue Book
Key Competence - Medical Device

Shenzhen:
- 700+ medical device companies
- 8% of the national medical device market

2010-2017 Shenzhen Medical Device Industry Production Value and Growth Rate

Annual Production value (hundred million yuan)

Source: Shenzhen Biomedical Industry Development Analysis Report by SINO-INNO Research
Key Competence – DNA Testing

- World’s leading life science and genomics organization
- Cooperation with thousands of organizations across multi-disciplinary research
- First national integrated genebank
- Public, non-profit, open, enabling and leading platform
- Clinical high-throughput gene sequencer--HYK-PSTAR-IIA gene sequencing system

- SARS-CoV-2 NP Ab ELISA kit
- Comprehensive health data platform
- Artificial intelligence and biotech
- Cancer immunotherapy
- Assistive cancer diagnosis gene detection

Source: Shenzhen Biomedical Industry Development Analysis Report by SINO-INNO Research
## Key Competence – Pharmaceutical

- Pharmaceutical Manufacture
  - 55 manufacturers
  - Total Profits: 5.78 billion yuan (816 million USD) in 2018

**Figure 14**: Share of value-added among top industrial sectors in GBA cities

<table>
<thead>
<tr>
<th>Sector</th>
<th>Shenzhen</th>
<th>Dongguan</th>
<th>Huizhou</th>
<th>Zhuhai</th>
<th>Zhongshan</th>
<th>Jiangmen</th>
<th>Foshan</th>
<th>Guangzhou</th>
<th>Zhaoqing</th>
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<tbody>
<tr>
<td>Computer, communication and electronic equipment</td>
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<tr>
<td>Electrical and mechanical equipment</td>
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<td>Heat and power generation</td>
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<tr>
<td>Petroleum processing, coking and nuclear processing</td>
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<tr>
<td>Non-metal mineral products</td>
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<tr>
<td>Non-ferrous metal smelting</td>
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</tr>
</tbody>
</table>

**Pharmaceutical Manufacture** ✔
Home to Life Science Innovation

Shenzhen Life Science Innovation Bases

21 National Level Innovation Bases

More than 300 Innovation Bases

Key Industrial Parks

Shenzhen International Bio Valley Life Science Industrial Park

Pingshan National Bio-industry Base

Nanshan Medical Device Industrial Park

Guangming Modern Biological Industrial Park

Source: Shenzhen Biomedical Industry Development Analysis Report by SINO-INNO Research
PCT Applications in Life Science Industry

- Top 5 Shenzhen Applicants

<table>
<thead>
<tr>
<th>Company</th>
<th>Applications</th>
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<tbody>
<tr>
<td>BGI</td>
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</tr>
<tr>
<td>mindray</td>
<td>260</td>
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<tr>
<td>BIOCAN</td>
<td>118</td>
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<tr>
<td>Lifetech</td>
<td>93</td>
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<tr>
<td>SIAT</td>
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</tr>
</tbody>
</table>

PCT Applications of Life Science Industry

- Patent search conducted on 04/23/2020
SECTION 3.2

OPPORTUNITIES IN SHENZHEN
Internationalization and Diversify Industry

- 5+ Exhibit Areas
- 10+ Trendy Topics
- 20+ Forums
- 200+ Companies
- 15,000+ Square Meters
- 20,000+ Participants

- Trend of Innovative Drugs
- Big Data of Healthcare and Medical Treatment
- Nano Tech in Medical Science
- Personalized and Precision Medicine
Investment Hotspots

2018 Shenzhen Life Science Industry PE / VC Distribution

Source: wind

Source: Shenzhen Biomedical Industry Development Analysis Report by SINO-INNO Research
Strong Regional Life Science Collaboration

Foshan:
- 2017 Pharmaceutical Output: 3 billion RMB
- Life Science Annual Growth Rate: 23.3%

Zhaoqing:
- 2017 Pharmaceutical Annual Growth Rate: 13.7%

Zhongshan:
- 300+ Life Science Companies
- Expected Industrial Output in 2022: 120 billion RMB

Jiangmen:
- 2016 Healthcare Industrial Output: 37 billion RMB
- Annual Growth Rate: 18%

Zhuhai:
- 2017 Life Science Industrial Output: 30 billion RMB
- First half of 2018:
  - Increased Output: 2.6 billion RMB
  - Growth Rate: 31.8%

Guangzhou:
- Life Science Industrial Output: 70+ billion RMB
- Average Annual Growth Rate: 15+% 
- Equal to 60% Total Output

Huizhou:
- Traditional Chinese Medicine

Dongguan:
- 300+ biotech companies, Growth Rate 42.7%
- 2014-2017 Life Science Annual Growth Rate: 28%

Shenzhen:
- 2017 Life Science Industrial Output: 240 billion RMB
- Increased Value: 30 billion RMB
- Annual Growth Rate: 24.6%

Hong Kong:
- R&D
- Universities Concentrated

Macau:
- R&D, fundamental research
- International talents

Source: Shenzhen Biomedical Industry Development Analysis Report by SINO-INNO Research
SECTION 3.3

COVID-19 AND LIFE SCIENCE INDUSTRY
COVID-19 and Life Science Industry

• Impact on Global Life Science Environment
  – Supply chain blockages
  – Drug and labor shortages
  – Materials and finished goods shortages
  – Clinical trial halts
  – Surging demands for COVID-19 related medical products

• Turn Crises into Opportunities in China
  – Produced 90% of APIs used in generic drugs
  – Increased exportation of medical protection products
  – Accelerated researches on related diagnosis kits and vaccines
  – Concentrated geographic centers for research and manufacture

Source: POTENTIAL IMPACT OF CORONAVIRUS (COVID-19) ON THE PHARMACEUTICAL AND BIOTECH INDUSTRIES, Morgan Lewis law flash
COVID-19 and Life Science Industry

• Forward-looking from “where we are here”
  – Use of AI based diagnostics and tools
  – Adoption of healthcare big data for disease management
  – Accelerated digital transformation of healthcare delivery models
  – Comprehensive ecosystem from early diagnostics to follow-up treatment
  – Supply chain integration and optimization

Source: Six Predictions for 2020 China Pharmaceutical & Health Care by Deloitte
Biography

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Eric has decades of experience representing clients in complex, high-stakes litigation—including trials, appeals, and government investigations. As a member of the firm’s litigation practice and the global leader of the firm’s intellectual property practice, Eric has achieved distinction across a broad range of matters. He is a fellow of the American College of Trial Lawyers and is listed in Chambers USA: America’s Leading Lawyers for Business (2013–19) and Best Lawyers in America (2008–19). In 2016, Chambers USA described Eric as “very smooth in court” and “a very good manager of complex matters.” Eric is a former Assistant US Attorney for the Eastern District of Pennsylvania and a former Special Deputy Pennsylvania Attorney General.

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