



**GLOBAL MARKETPLACE — EYE ON CHINA:
WEB SERIES**

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GLOBAL MARKETPLACE — EYE ON CHINA: WEB SERIES



**Innovation Management and
Technology Transfer in China:
The Big Picture And The Little Details**

July 22, 2010

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Panelist
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Science-Technology Development Guidelines (2006-2020)

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- National medium- and long-term programs for science and technology development
- By 2020, investments in research and development projected to be 2.5 percent of GDP
- Develop frontier technologies in sectors such as biology, information industry, materials technologies and advanced manufacturing technology
- China to urge large enterprises to set up research and development (R&D) institutes

Xinhua News Agency February 9, 2006; <http://www.china.org.cn/english/2006/Feb/157484.htm>



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The Five-Year Plan for National Economic and Social Development



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- Arranges national key construction projects
- Manages the distribution of productive forces and individual sector's contributions to the national economy
- Maps the direction of future development
- Sets targets



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Major High-tech Projects (2006-2010)



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- Integrated circuits and software
- New-generation network
- Advanced computing:
- Biomedicine
- Civil airplane
- Satellite application
- New materials: high-performance information, biological and aerospace industries



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Agenda

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- How is the commercialization of new technology really viewed in China?
- Who are the gatekeepers to technology?
- Where in China is technology being developed?
- Overview of life science technology development in China.
- What are the potential pitfalls when partnering to develop new technology in China?
- How can companies structure deals to mitigate or avoid disputes down the road?



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Realities of Commercializing Technology in China



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Commercialization of New Technology in China



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- How is the commercialization of new technology really viewed in China? Who are the gatekeepers to technology in China?
 - Highly (or overly) encouraged but loosely regulated: PI vs. TTO (centralized vs. networks)
 - Forming mutually beneficial alliances: practical and flexible business models (Hi tech parks, local pharmaceutical / biotech companies)



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Mega New Drug Development Program



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- First China government program dedicated solely to drug development
- More than \$12B available over 5 years
- Program led by MOST and MOH
 - New drugs, new processes, new platforms for drug development
 - Oncology, CVD, CNS, diabetes, immunology, and infectious disease
- Over \$1B US granted thus far to 53 universities/institutes
- Ultimately – 1000 projects, 200+ companies



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Source: ChinaBio® Consulting 10

Commercialization of New Technology in China (cont.)



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- Useful Web sites:
 - China National Center for Biotechnology Development :
<http://www.cncbd.org.cn/web/Default.aspx>
 - The Ministry of Science and Technology of the People's Republic of China:
<http://www.most.gov.cn/>
<http://www.pharmnet.com.cn/>
 - China Science and Technology Network:
<http://www.cstnet.net.cn/>



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Technology Categories (Import and Export)



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- Prohibited
- Restricted (requires approval of MOFCOM)
- Permitted (agreement must be registered with MOFCOM but there is no substantive review)



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Chinese Government Approval

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- **Approval Process**
 - Application for Importing PRC Restricted Technology
 - Within 30 business days MOFCOM must approve or reject the application
 - Upon approval, MOFCOM issues Proposal for Technology Import License of the PRC
 - Parties may sign a definitive agreement and other application materials for final MOFCOM approval. If approved, MOFCOM issues a Technology Import License for the PRC.



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Barriers to Entry for Foreign Individuals/Entities

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- **Legal barriers**
 - Governmental approval, concerns over IP protection and enforcement and contractual integrity and enforcement
- **Cultural/Business – Lack of “guanxi”**
 - Cultural ignorance, lack of knowledge of the business and industry landscape



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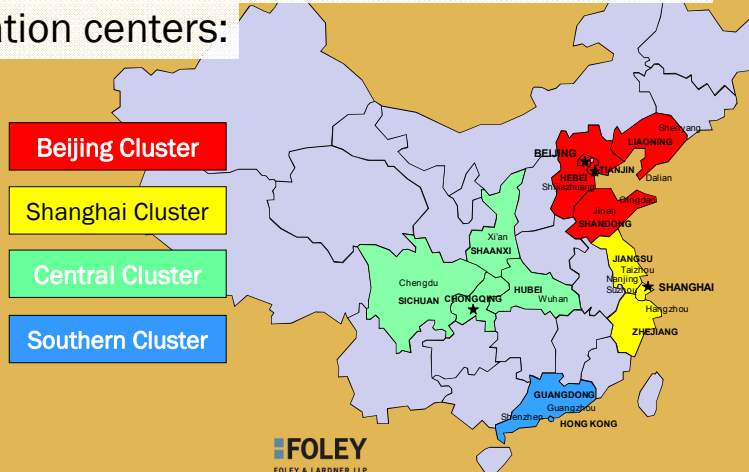


Where in China is Technology Being Developed?



Innovation Centers

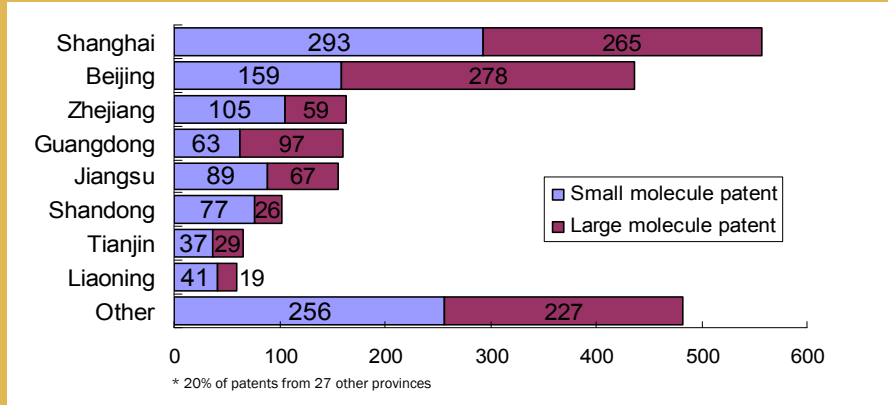
Four clusters centered around China's major innovation centers:



Patents by Location

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46% of novel molecule patents from Shanghai & Beijing



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Source: ChinaBio® Consulting, SIPO 17

Restrictions on Foreign Investment

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- Import/export restrictions
- Currency restrictions

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Recommended Strategies

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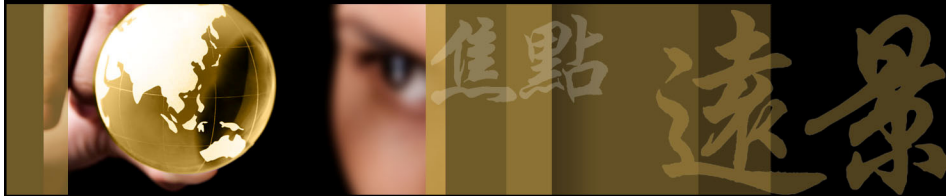
- Obtain good legal help and a strong partner in China
- A foreign company needs to have a government relations strategy as part of any business opportunity



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Life Science Technology Development in China



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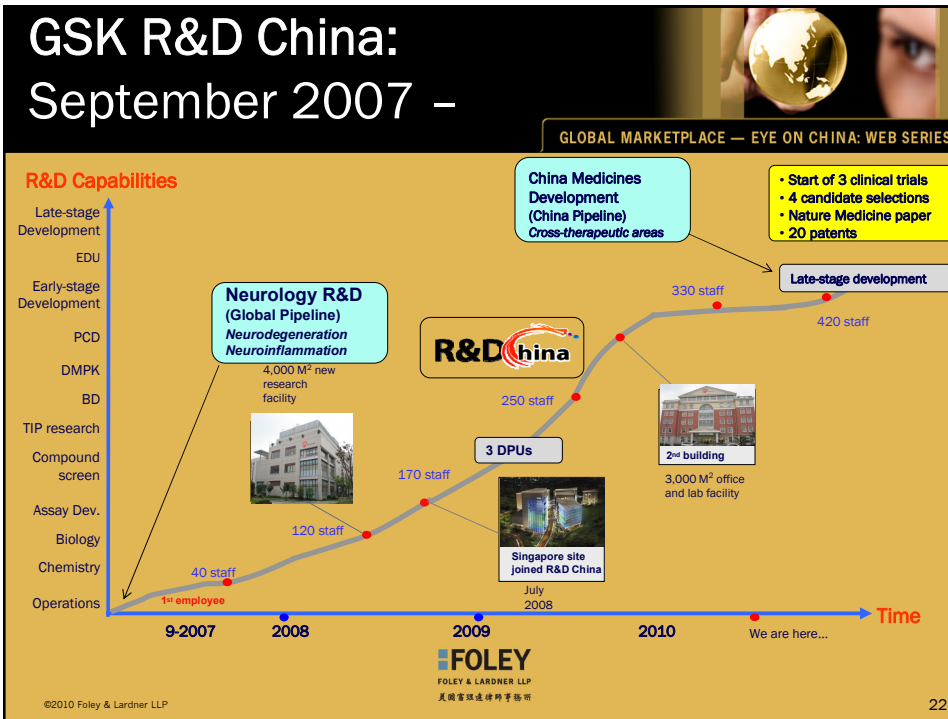


Life Science Technology Development in China

Guang Yang **R&D China**



GSK R&D China: September 2007 –



Emerging Rx Market Growing at 19% Annually



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3rd Largest Pharmaceutical Market in 2015

Rank	2002 ¹ (USD Bn)	2004 ¹ (USD Bn)	2006 ² (USD Bn)	2008 ² (USD Bn)	2010 ³ (USD Bn)	2011 ² (USD Bn)
1	USA	198	USA	241	USA	275
2	Japan	53	Japan	65	Japan	63
3	France	20	France	30	France	35
4	Germany	20	Germany	29	Germany	33
5	UK	14	UK	20	UK	24
6	Italy	13	Italy	19	UK	21
7	Spain	9	Spain	13	Spain	16
8	Mexico	8	Canada	12	Canada	15
9	Canada	8	China	10	China	14
10	China	6	Mexico	8	Brazil	11
11	Brazil	5	Brazil	7	Mexico	11
12	South Korea	5	Australia	6	South Korea	9
13	India	5	South Korea	6	Turkey	7
14	Australia	4	Turkey	6	India	7
15	Turkey	3	India	6	Australia	7

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Note:
1. Source: IMS World Review 2007
2. Source: IMS Market Prognosis 2007-2011
3. At ex-manufacturer price level

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China GDP Growth Rate



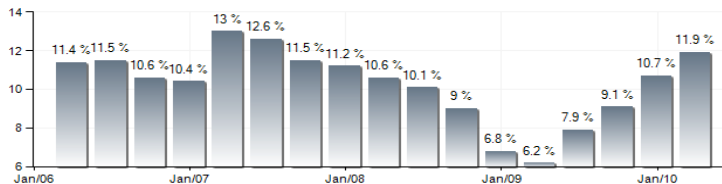
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Country	Interest Rate	Growth Rate	Inflation Rate	Jobless Rate	Current Account	Exchange Rate
China	5.31%	11.90%	2.80%	4.20%	297100	6.8315

January of 2006 to June of 2010 UPDATE CHART ANALYSE DATA

China GDP Growth Rate

— Annual GDP Growth Adjusted by Inflation



source: National Bureau of Statistics

www.tradingeconomics.com

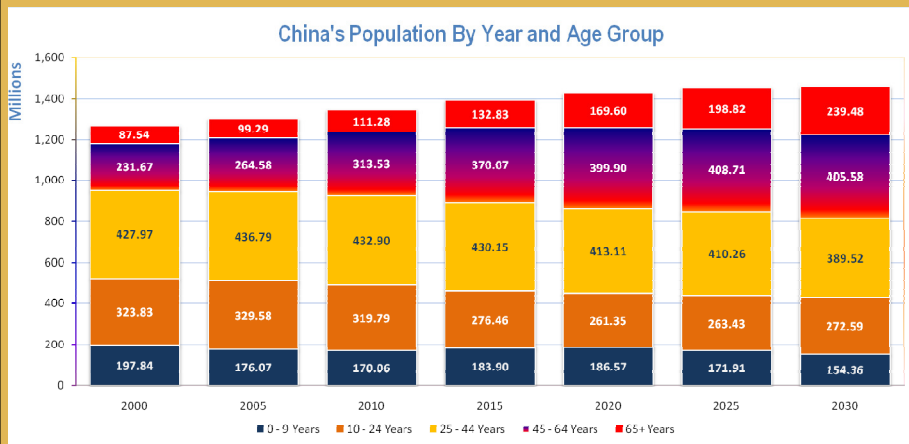
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Ageing Demographics

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Data sources: China Health Statistics,
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China Health-care Reform

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- By 2020, the world's most populous country will have a basic health-care system that can provide "safe, effective, convenient and affordable" health services to urban and rural residents, according to the tone-setting document.
- This will be supplemented by a more detailed implementation plan for the three years until 2011. The plan has yet to be published, but the State Council announced earlier this year an investment plan of 850 billion RMB (124 billion U.S. dollars) for the reform in three years.

Source: People's Daily, April 7, 2009

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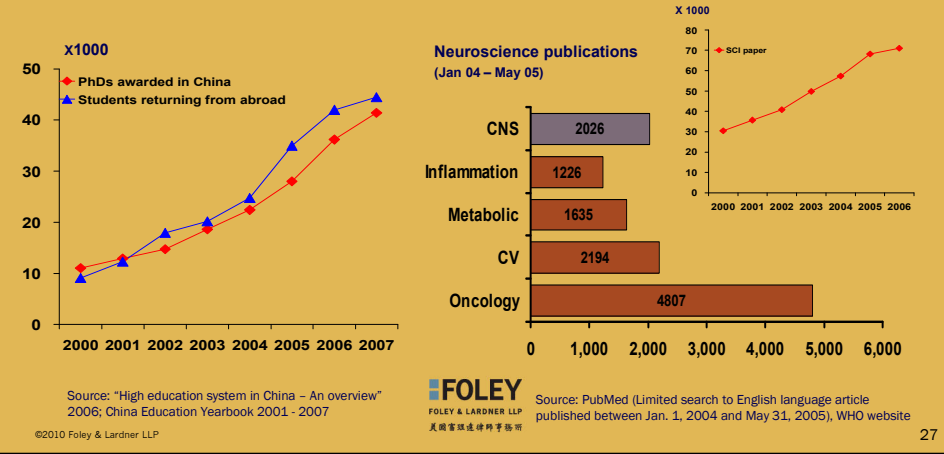
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Talent Pool and Life Science in China



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- Increasing research output as measured by high-quality publications in *Cell*, *Nature*, *Science*, *Neuron*, ...
- Increasing amount of highly educated researchers



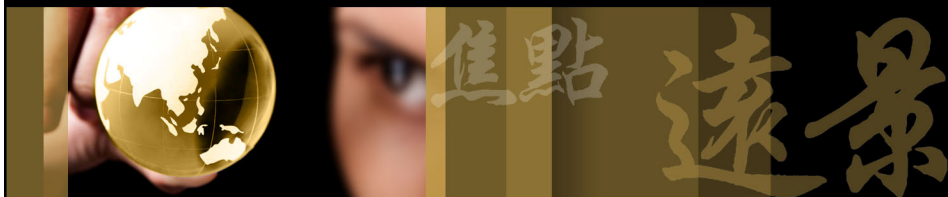
Life Science in China



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- Early fast growing stage: fast follower vs. innovation
- Consolidation, a future business opportunity?!
- TCM-based research
- Regional Diseases





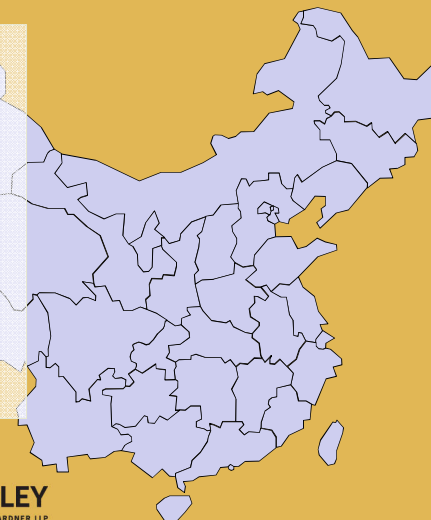
China Life Science

Greg B. Scott



China's future: #1 in life science?

- 7,500 life science companies
- 500 universities & institutes
- 2,500 leading researchers
- 58 life science parks
- 200+ life science incubators
- 2,500 novel drugs patented
- 500,000 returnees
- >85,000 BS, 60,000 MS, 16,000 PhDs each year



Driving Factors

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1. Low cost → high quality → innovation
2. Returnees or “sea turtles” (250,000+ returnees in last 4 years)
3. Drive to innovate (#2 in patent applications worldwide)
4. Government stimulus → significant funding for R&D
5. Many “Silicon Valleys” throughout China
6. Urbanization → increased demand (+300M by 2025)
7. Healthcare reform → bigger market, better care (\$124B)
8. Strong economy → China GDP growth “slows” to 10%



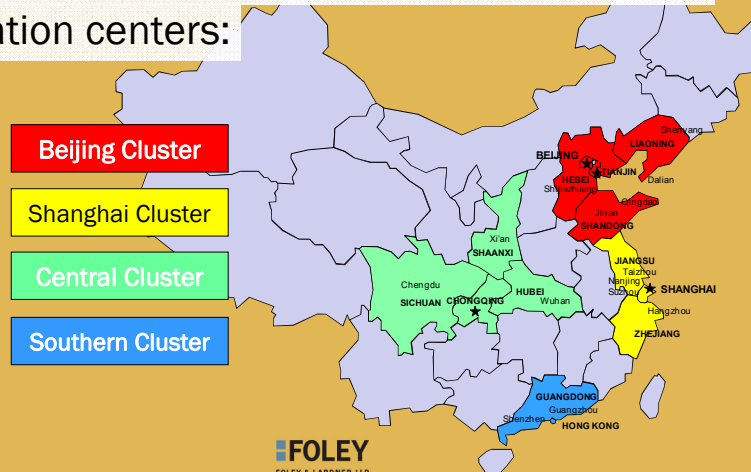
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Source: ChinaBio® Consulting, MOE 31

Innovation Centers

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Four clusters centered around China’s major innovation centers:



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Source: ChinaBio® Consulting

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Government Funding



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- Central Government
 - Ministry of Science and Technology (MOST)
 - Ministry of Health (MOH)
- Provincial/Regional/Municipal
- Life Science Parks / Incubators (58)
 - Zhangjiang Hi-Tech Park (Shanghai)
 - Zhongguancun (Beijing)
 - BioBay (Suzhou)
 - Guangzhou, Taizhou, Tianjin, Hong Kong, Wuhan, Nanjing, etc.



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Source: ChinaBio® Consulting 33

Government Funding (cont.)



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- Institutes/Universities (+500)
 - China Academy of Sciences (CAS)
 - China Academy of Medical Sciences (CAMS)



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Mega New Drug Development Program

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- First China government program dedicated solely to drug development
- More than \$12B available over 5 years
- Program led by MOST and MOH
 - New drugs, new processes, new platforms for drug development
 - Oncology, CVD, CNS, diabetes, immunology, and infectious disease
- Over \$1B US granted thus far to 53 universities/institutes
- Ultimately – 1000 projects, 200+ companies



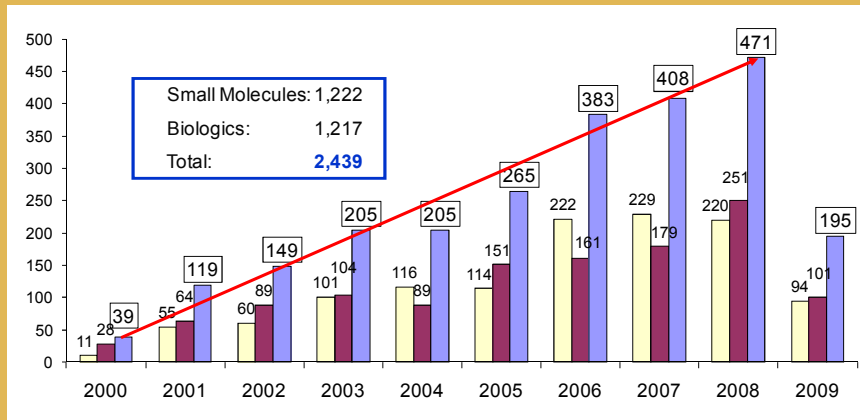
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Source: ChinaBio® Consulting 35

Novel Molecule Patents

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Up 12 fold since 2000; 36.5% average growth



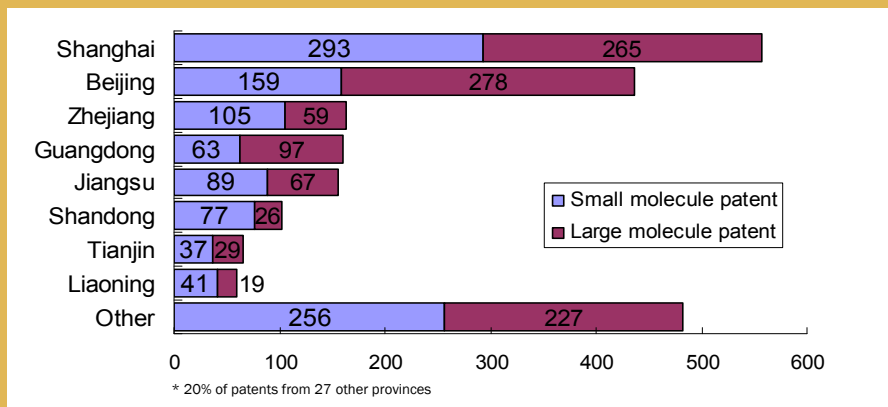
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Source: ChinaBio® Consulting, SIPO 36

Patents by Location

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46% of novel molecule patents from Shanghai & Beijing



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Source: ChinaBio® Consulting, SIPO 37

Institutional Funding

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For life science companies:

- VC Funding – \$253M, Q1; \$23M/deal
- IPOs – 9 in H1 2010, generating \$1.7B US

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Source: ChinaBio® Consulting 38

Sample Partnering Deals

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Company A	Company B	Date	Collaborate type
Peking University	Pfizer China *	Q1 '09	Partnership
Hutchison MediPharma *	Ortho-McNeil-Janssen Pharmaceuticals, Inc.	Q1 '09	Co-development
Simcere Pharma	Epitomics, Inc.	Q1 '09	Co-development
Lee's Pharmaceutical	Nippon Shinyaku	Q1 '09	In-license
Tianjin Tianda Pharmaceutical Co., Ltd.	Simcere Pharmaceutical Group	Q4 '09	Partnership
BMP Sunstone Corporation	Pfizer China*	Q4 '09	Co-marketing
Tianjin Tianda Pharmaceutical Co., Ltd.	Simcere Pharmaceutical Group	Q4 '09	Partnership
Ascentage Pharma Group Corporation, Ltd.*	3SBio Inc. *	Q1 '10	Co-development & Co-marketing
Mindray Medical	Pulsion Medical Systems	Q2 '10	In-license
Genzyme Corporation	Tianjin (TJAB) *	Q2 '10	Partnership



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Partnering in China



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Due Diligence

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- Use a specialist in background investigations
- Check status of licensee, permits, licenses and reputation
- Check with local connections and government authorities
- On-site due diligence



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Forms of Agreements

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- License agreement
- Joint venture
- Wholly Foreign Owned Enterprise (“WFOE”) – issues to consider are the amount of control and amount of investment



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Key Issues in Technology Transfer Agreements



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- Description of the technology licensed or developed
- Specifications – functional-technical
- Payment mechanism such as royalties (up-front or staged, caps)
- Development responsibilities
- Milestones
- Liquidated damages
- Ability to make derivative works
- Ownership of modification
- Warranties of licensor (utility of technology, protection of know-how etc)
- Termination of agreement



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PRC Requirements



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- Cannot impose unreasonable conditions such as requirement to purchase unnecessary technology, raw materials, products, equipment or services
- Payment for expired patents
- Prohibiting licensee from making improvements or using improvements
- Prohibiting licensee from obtaining competitive technology
- Unreasonable restraints on channels or sources of raw materials or spare parts



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PRC Requirements (cont.)

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- Unreasonable restraints on product volume, types or prices
- Unreasonable restraints on export channels or products manufactured out of the contracted technology
- Term cannot extend beyond the life of the patent
- Licensor warranties –it is the owner, the technology is complete, error free, valid and capable of accomplishing the contracted purpose
- Indemnity –licensor must indemnify licensee for infringement of third party rights



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Strategies to Mitigate/Avoid Disputes



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Best Practices to Avoid a Dispute

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- Local presence with constant communication
- Relationship building
- On-going monitoring
- Work hard to keep interests aligned



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Dispute Resolution

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- Negotiation
- Intermediaries
- Mediation
- Get the government involved
- Lawsuit (last resort)



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Arbitration in China

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- Types of arbitration
 - 1) Domestic arbitration
 - 2) Foreign related arbitration and foreign arbitration
- CIETAC – The China International Economic Trade Arbitration Commission –viewed with concern by foreign companies as a result of transparency of arbitrator compensation, improper influence, bias etc.
- HKIAC -Hong Kong International Arbitration Commission



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Questions & Answers

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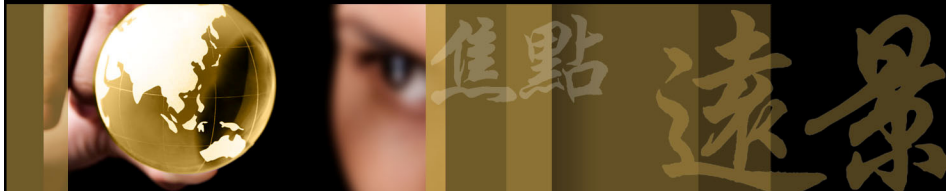
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谢谢!



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