

Post-Industrial East Asian Cities: Singapore

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Singapore's Biotech Sector

- In 2004, biomedical manufacturing (including pharmaceuticals and medical technology) accounted for 2.6% of employment, 9.1% of output, and 21.3% of value-added in manufacturing.
- Singapore's effort in creating biotech cluster is following closely to the emergence of biotech clusters in the United States.
- Key ingredients of the US model are:
 - Universities, and linkages with businesses
 - Star scientists as inventors and entrepreneurs
 - Role of risk capitals
 - Large pharmaceutical firms
 - Clusters around key hospitals, universities, government labs
 - Urban amenities

Singapore's Biotech Sector

- The elements of strategies adopted by Singaporean government.
- The creation of Biopolis
 - Investment of US\$286 million
 - Houses five public institutes
 - Close to NUS Hospital
 - Place where researchers can “work, live, play, and learn”
- Attracting MNCs through FDI incentives (first for manufacturing, then gradually shifting to research activities)
- Global linkages to make Singapore as a cost-efficient clinical trial site

Singapore's Biotech Sector

- Attracting star scientists from abroad
 - Jackie Ying, Alan Coleman, Bernat Soria, Axel Ulrich, Sydney Brenner, Edison Liu, David Lane, Yoshiaki Ito
 - Taking advantage of English being the official language which facilitates communication among researchers from around the world
- Investment in domestic human capital
 - Establishment of specialized degree programs in Singapore
 - (bonded) Scholarship programs to provide overseas training
 - Modification of curriculum at tertiary and secondary school to include subjects on life sciences and entrepreneurship

Singapore's Biotech Sector

- Venture funds backed by government
- Improving the quality of research at universities
- Stimulating University-Industry Linkages

Singapore's Biotech Sector

- Competition: Korea, Taiwan (China), China, and India.
- The growth opportunity is large but uncertain.
 - US spends 16% of GDP on health care
 - Other countries spend close to 6%
 - With aging and rising incomes in other countries, the opportunities for biotech sector is large, especially for medicine
- However, the future of pharmaceutical industry uncertain
 - Rising costs of new product development, yet fewer blockbuster drugs in the pipeline
 - Possible backlash against rising medical costs in advanced countries and scandals with major drugs
 - Whether Singapore has enough scale
 - Heavy reliance on foreign firms and talents