

Health Care Reform and Biomedical Sciences in Academic Institutes in China

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Three topics will be discussed:

- 1) Health care reforms in China**
- 2) Biomedical sciences in academic institutes**
- 3) Industry-academia-research system and patent management in SYSU**

1) Health Care Reforms

Objectives of Current China Health Care Reforms

To meet basic health care needs equitably for billions of people, under a budgetary constraint

- Significant increase in health insurance coverage
- Controlling for drug spending by establishing an essential drug list
- Establishing / improving basic health care delivery systems
- Promoting public health
- Exploring reform options for a hospital system predominated by public hospitals

Significant investment needed to improve China's health care research infrastructures

Objectives

- **Improving health care quality, outcomes, and efficiency**
 - Promoting evidence-based medicine
 - Integrated health IT systems (electronic health records)
- **Advancing medical science and technologies**
 - Discovery of new treatments
 - Participation in multi-site / national clinical trials
- **Training the next generation of health care providers**

Significant investment needed to improve China's health care research infrastructures

Such research infrastructures are also keys to future economic vitality, as health care industries become an integral part of national / local economies.

- Duke-National University of Singapore Graduate Medical School**
- Push for “medical tourism” throughout southeast Asia**
- Health care, one of the key areas for economic recovery in Hong Kong**

However, China's national health care priority — meeting the basic health care needs of billions — may deter governmental investment needed for such improvements.

Exploring reform options for a hospital system predominated by public hospitals

Current hot debate topic:

**A China-style private for-profit hospital:
Public-private partnership (PPP)**

Guangzhou is planning for a “Healthy City” center for Southern China

- About 3.7 square kilometers**
- Establishment of a cancer center, a heart center, a rehabilitation center, and a general hospital**
- Public-private partnership**
- International investment is encouraged**

2) Biomedical Sciences in Academic Institutes

Sun Yat-sen University Cancer Center

- Bioscience is of the eight key disciplines of Sun Yat-sen University
- The largest specialized cancer center in southern China



Cancer Center Clinical Departments

Head and Neck Surgery

Nasopharyngeal Carcinoma

Thoracic, Abdominal

Liver and Biliary

Gynecological Surgery

Radiotherapy

Biotherapy

Endoscope and Laser

Traditional Chinese medicine

Anesthesiology, ICU,

GCP Center

Research

Main focuses:

- NPC research
- Comprehensive treatment of liver cancer
- Anti-cancer gene therapy
- Establishment of community cancer registry network

Research

Research Organizations:

State Key Laboratory of Oncology in Southern China

National Clinical Study Center for Anticancer Drugs

Grants:

National Science and Technology Plan

National Excellent Young Fund

National 863 Program of High and New Technology

National 793 Climbing Program

National Natural Science Fund

American CMB Fund, etc.

Facilities and resources



Representative publications

1. The pivotal role of c-Jun NH2-terminal kinase-mediated Beclin 1 expression during anticancer agents-induced autophagy in cancer cells. **Oncogene** 2009; 28(6):886
2. Aurora kinase inhibitory VX-680 increases Bax/Bcl-2 ratio and induces apoptosis in Aurora-A-high acute myeloid leukemia. **Blood** 2008; 111:2854
3. Aurora-A, a negative prognostic marker, increases migration and decreases radiosensitivity in cancer cells. **Cancer Res** 2007; 67:10436
4. Aurora A, mitotic entry, and spindle bipolarity. **Proc Natl Acad Sci USA** 2006; 103: 5811
5. Bmi-1 is a novel molecular marker of nasopharyngeal carcinoma progression and immortalizes primary human nasopharyngeal epithelial cells. **Cancer Res** 2006; 66(12):6225

Representative publications

6. Preparing the “soil”: the primary tumor induces vasculature reorganization in the sentinel lymph node before the arrival of metastatic cancer cells. **Cancer Res.** 2006; 66(21):10365
7. Genomic sequence analysis of Epstein-Barr virus strain GD1 from a nasopharyngeal carcinoma patient. **J Virol** 2005; 79(24):15323
8. Chapter: Tumours of the Nasopharynx. In: **WHO Classification of Tumors**, Pathology and Genetics of Head and Neck Tumors, 95-97. IARC press, 2005.
9. Phase III study comparing standard radiotherapy with or without weekly oxaliplatin in treatment of locoregionally advanced nasopharyngeal carcinoma: preliminary results. **J Clin Oncol** 2005; 23(33):8461
10. Genome-wide scan for familial nasopharyngeal carcinoma reveals evidence of linkage to chromosome **Nature Genet** 2002; 31(4):395

Prizes and Awards

National Prize for Natural Sciences (2nd class)

Chinese Medical Sciences & Technology Award in 2005 (1st class)

Natural Science Award of Ministry of Education (1st class)

Guangdong Province's Technology Advancement Award (1st class)



International collaborations

- **WHO Collaborative Center in Cancer Research**
- **Sister institution of the University of Texas MD Anderson Cancer Center in the US**
- **Collaborative laboratory with Karolinska Institute in Sweden**

Challenges of biomedical development

Cancer — the most serious human disease

Aims:

Prevent and treat cancers

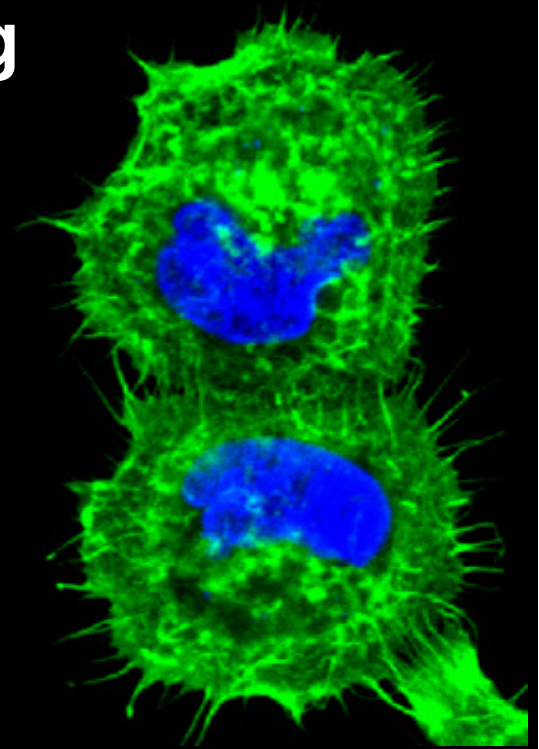
Improve survival & reduce suffering

Requirements:

Significant financial inputs

Great intellectuals

Organizational resources



The collaborative directions of the future

I: Scientific and technological exchanges

1. Reciprocal visits of scientists

2. International conferences

3. Joint educational projects

- **No-barrier communication**
- **Focus on leading-edge biomedicine**
- **Train scientific successors**



Distant consultation



Scholar communication

II: Resource sharing

Sun Yat-sen University Cancer Center

- **> 1500 staff members**
- **> 200 senior specialists**
- **43 Ph.D. program supervisors**
- **Many young and energetic specialists**

- **1100 ward beds**
- **350 000 out-patients per year**
- **25 000 in-patients per year**
- **>10 000 new patients per year**

II: Resource sharing

Sun Yat-sen University Cancer Center

Large-scale specimen storeroom

- **blood samples: >30 000**
- **normal tissue samples: > 6000**
- **tumor tissue samples: > 6000**



III: Clinical trials

National Clinical Center for Anticancer Drugs

Good Clinical Practice (GCP) Center

- Phases I – III clinical trials
- Individualized chemotherapy
- Training specialists in clinical trials



Enormous potential in shared systems

- **Build a multi-institutional collaboration model**
- **Study the appropriateness and effectiveness of treatments**
- **Exceed the sum of contributions by the individual campuses**

The goals of the collaboration

- Built a firm collaborative mechanism, creating mutual systems to integrate clinical research and care across the two countries
- Creating a biospecimen repository that has broad racial and ethnic representations.
- Advance the science of prevention, screening, diagnosis, and treatment of breast cancer
- Worldwide university network of academic medical centers

3) Industry-Academia-Research System and Patent Management in SYSU

SYSU's Innovations and Technology Transfer Accomplishments (2006-2009)

SYSU has

- applied for 110 new invention patents**
- applied for 12 new utility model patents**
- 69 issued patents**

The most significant change in the content of the university research in China has been the rise of biomedical research and inventive activity.

From Innovation to Invention

- The prime **role** of a research university is excellent basic research
- Universities are globally the prime **source** for innovation and creativity
- Our mission statement is knowledge transfer to the scientific community, industry, and the general public
- **Technology transfer** as a specific case of knowledge transfer

The Route to Tech Transfer

- **Any member of the university staff has the option – but not on obligation – to file patents to protect intellectual properties**
- **All patenting activities are handled by the Tech Transfer companies**
- **The decision to file a patent application is based on both the technology and a market analysis**
- **Faculty member is entitled to part of the commercialization revenues**

Options for Commercialization

- **Licensing of the technology to a large company**
- **Establishment of a start-up company (equity equivalents as alternative to licensing payments)**
- **Technology maturation in the framework of the university (for example the TAU-Tech partnership).**
- **Sponsored research and options**

Technology Transfer Approaches

- **Pure licensing approach**
 - **Non-exclusive**
 - **Exclusive**
- **Spin-off enterprises**
 - **Faculty typically are owners and/or principal scientists.**
 - **University may or may not require an ownership stake as a condition of licensing.**
 - **University may have concerns about the faculty member's allocation of effort between university duties and the spin-off company.**

Potential Problems In Protecting Intellectual Property during International Collaborations

- **Most research outcomes are published as theses instead of patents**
- **Management for the property rights of intellectual property is nonstandard and limited**
- **Management for the participations in the international collaborations is limited**

Solutions

- **Bring up specialists for patent application and management. Build a patent-central scientific research management system in the university**
- **Reform and improve the standards involved in protection of intellectual property of the international cooperation**

Based on: friendship thoughts

benefit evaluation stimulation

Concluding remarks

If all British and Chinese researchers and health care providers work together in an organized and cohesive way as equal partners, there will be a tremendous opportunity to leverage research to improve prevention, diagnosis, treatment, and survivorship for cancer patients.

WE DON'T HAVE TO BE AFRAID OF

cancer

THANK
YOU!!

