The Education and Research Opportunities with Zhejiang University School of Medicine

Tianhua Zhou, MD & PhD
Vice Dean for International Affairs
Zhejiang University School of Medicine

September 24, 2013
Contents

- Hangzhou City
- Zhejiang University
- Zhejiang University School of Medicine (ZUSM)
Zhejiang Province:

1% of land (0.1M/9.6M Km²)

3.5% of population (48M/1350M)

7% of Production (3.5T/53T RMB)

钱塘潮  High tide of Qiantangjiang
Hangzhou City

222 BC, Qiantang County

589, named as Hangzhou

923, Capital of Wuyue Kingdom

1138, Capital of Southern Song Dynasty
(one of the 7 ancient capital cities in China)
Hangzhou is the most beautiful and splendid city in the world.

-Marcus Polo (1254-1324)

Marco Polo is an Italian merchant traveler from the Republic of Venice.
Hangzhou City

The Logo of Hangzhou City
Hangzhou West Lake cultural landscape inscribed on world cultural heritage list (June 24 2011)
History of Zhejiang University

Originated from Qiushi Shuyuan (Truth Academy) founded by LIN Qi, the Magistrate of Hangzhou Prefecture in 1897

LIN Qi 林启 (1839-1900)
History of Zhejiang University

1928 formally named to National Zhejiang University

国立浙江大学
History of Zhejiang University

• 1998 Four universities in Hangzhou were merged to form the new Zhejiang University:
  • Zhejiang University
  • Hangzhou University
  • Zhejiang Agriculture University
  • Zhejiang Medical University
Facts of Zhejiang University

- 12 academic disciplines: philosophy, economics, law, education, literature, history, art, science, engineering, agriculture, medicine, management
- 7 faculties and 37 colleges/schools
- 44,874 full-time students
  - 13,704 graduate students
  - 8,241 Ph.D candidates
  - 22,929 undergraduates
- 3,156 international students from 128 countries
Campus of Zhejiang University

Zijingang  紫金港
(Zijin Harbour)
Yuquan   玉泉
(Jade spring)
Xixi    西溪
(West brook)
Huajiachi  华家池
(Huajia pool)
Zhijiang  之江
(Zhijiang River)
Hubin    湖滨
(Lakeside)
Zijingang Campus Birds Eye View
2012 London Olympic Champions **SUN Yang** and **YE Shiwen** are **Hangzhou natives**. Sun Yang is also an undergraduate student of Zhejiang University.
History of Medical School

Chekiang College of Medicine in 1912

In 1952 merged with Chekiang University Medical College (1946) to form Zhejiang Medical College, in 1960 renamed to Zhejiang Medical University

Zhejiang University School of Medicine in 1999

To moved to Zijingang Campus in 2006
The Centenary Celebration of Medical School (1912-2012)

百年浙医庆典
DUAN Shumin, PhD & MD
A Neuroscientist
Member, Chinese Academy of Sciences

Selected Publication (Corresponding Authors)

Dou et al., Cell Res, 2011
Song et al., Cell, 2009
Tong et al., J Cell Biol, 2009
Ge et al., Science, 2006
Shen et al., Neuorn, 2006
Li et al., Neuron, 2004
Zhang et al., Neuron, 2003
Yang et al., PNAS, 2003
Wang et al., Neuron, 2003
Xiang et al., Nature Neuroscience, 2002
National Ranking of Medical School

*Among 160 medical schools

WU Shuliang 2012
Organization of Medical School

Faculty of Medicine

School of Medicine

School of Pharmaceutical Sciences

Departments
- Public Health
- Basic Medicine
- Clinical Medicine
- Dental Medicine
- Nursing

Affiliated Hospitals
- 1st Hospital
- 2nd Hospital
- Sir Run Run Shaw Hospital
- Woman’s Hospital
- Children’s Hospital
- Dental Hospital
- Yiwu Hospital

The Institutes for Translational Medicine
Staffs of Medical School

All staff 12,519

University-based payroll 602
- Full Professors 140
- Associate Professors 96

Hospital-based payroll 11,917

*Data updated September, 2013*
International Cooperation of Medical School

Key partners: UCLA, Loma Linda University, University of Edinburgh
Education of Medical School

Students (2012)

- Undergraduate Students  1425
- Graduate Students      2260
- Overseas Students      517

Enrolled in 2013

- Undergraduate         487
- Graduates             520
- Overseas Students     96
Education of Medical School

Programs for Medical Education

- MD (8′), 2005
- Bachelor of Biomedical Sciences (with Master of Edinburg University), 2012
- MBBS for International Students (51/2′), 2006
- Bachelor of Medicine (5′), 2012
- MD-PhD, 2004
- Master of Medicine (7′), 1988-2011
- Master of Dental Medicine (7′), 2002
- Master of Public Health (MPH) (7′), 2006
- Master of Science in biomedical sciences(7′), 2006
- Master Program for Nursing (3′), 1997
8-year M.D. program - 1

An entire new training mode: “4+4”

Throughout 8 years, 2 entire stages

“4+4” mode

High school graduates

Chu Kochen Honors College, Zhejiang University

1st “4”-year

Bachelor degree in any major other than medicine

Medical doctor (M.D.) degree

2nd “4” year

Zhejiang University School of Medicine
# An entire new training mode: “4+4”

## Unique in China

<table>
<thead>
<tr>
<th>ZJU School of Medicine</th>
<th>Other medical schools</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2 entire stages</strong></td>
<td></td>
</tr>
<tr>
<td>“4 +4”</td>
<td></td>
</tr>
<tr>
<td>Undergraduate courses</td>
<td>Pre-medical courses</td>
</tr>
<tr>
<td>Medical courses</td>
<td>Medical courses</td>
</tr>
<tr>
<td></td>
<td>Post-medical courses</td>
</tr>
<tr>
<td><strong>1 medical degree+1 other degree</strong></td>
<td>2 medical degrees</td>
</tr>
<tr>
<td>Non-medical Bachelor</td>
<td>Bachelor of medicine</td>
</tr>
<tr>
<td>&amp;</td>
<td>&amp;</td>
</tr>
<tr>
<td>Medical doctor (M.D.)</td>
<td>Medical doctor (M.D.)</td>
</tr>
</tbody>
</table>
New curriculum-1st “4” year

“4+4” mode

1st “4”-year
Chu Kochen Honors College,
Zhejiang University

Medical school entrance requests

Get bachelor degree
Finish medical foundation courses
Pass CET-6

undergraduate 4 years
8-year M.D. program - 4

New curriculum-2nd “4” year

“4+4” mode

2nd “4” year
Medical School,
Zhejiang University

Years 1 & 2
Human Biology and integrated medicine---
-Adopt Human Biology and Diseases (HBD) curriculum from UCLA

Year 3:
Junior Clerkship

Year 4:
Senior Clerkship

Years 1 & 2
for preclinical phase

Years 3 & 4
for clinical phase

Integrated medicine
clinical foundation

Junior Clerkship
Senior Clerkship
New curriculum-2nd “4” year

Years 1 & 2: Human Biology and integrated medicine

Principle

Integrate basic, clinical and social sciences

Promote active learning for deep understanding

Disease based learning

Promote student research
Years 1 & 2: Human Biology and integrated medicine

A typical week

**Weekly theme & goals**

- **PBL:** 4 hours
- **Lectures:** 13-16 academic hours (45 min/a.h.)
- **Lab:** 8 a.h.
- **Doctoring:** 4 a.h.

**Weekly online formative assessment**
8-year M.D. program - 7

<table>
<thead>
<tr>
<th>Years 3 &amp; 4: Junior &amp; senior clerkship</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Junior clerkship</strong></td>
</tr>
<tr>
<td>60 weeks</td>
</tr>
<tr>
<td>In a ward medical team</td>
</tr>
<tr>
<td>Be on duty</td>
</tr>
<tr>
<td>Join in doctor consultation</td>
</tr>
<tr>
<td>Outpatient service (1/2 day per dept)</td>
</tr>
</tbody>
</table>

| Senior clerkship                       |
| 34 weeks                               |
| Special clinical skills training       |
| Clinical training at higher levels     |
| Treat emergency and serious patients   |

Track the onset and course of the disease
In 2012, as a part of the pilot reform project, the School of Basic Medical Sciences established the Program of Biomedical Sciences.

Core mission: to prepare the students to be leaders in the field of BMS in the 21st century.
New Biomedical Sciences program - 2

Design: 3 + 1 + X Degree Program

1. Zhukezhen Honor College
   - Common Courses

2. Basic Medical Science
   - Majored Courses

1. The University of Edinburgh
   - Master Program

Multiple Channel

Curriculum & Research Training

Diverse Development

Recommendation

High School SS (G11)

Selection

Biomedical Sciences PhD

Management/Law/...
New Biomedical Sciences program -3

◆ Admission of the BMS Students
  □ Excellent high school students: Recommended, Exam-free, Interview
  □ Selection from excellent freshmen in ZJU
◆ Special curriculum and training model
  □ First year in Chu KoChen Honor College, under a special ZJU program for training innovative scientists.

◆ Developing partnership with leading universities around the world
  □ In 2012, the “3+1” collaborative agreement with U. Edinburgh:
    ➢ Bachelor Degree at Zhejiang University (3 years)
    ➢ Master Degree at the University of Edinburgh (1 year).
MBBS program for International Students - 1

Started in 2006
English Medium, 5.5 years

<table>
<thead>
<tr>
<th>Batch</th>
<th>Student</th>
<th>Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>43</td>
<td>8</td>
</tr>
<tr>
<td>2007</td>
<td>100</td>
<td>19</td>
</tr>
<tr>
<td>2008</td>
<td>73</td>
<td>16</td>
</tr>
<tr>
<td>2009</td>
<td>78</td>
<td>21</td>
</tr>
<tr>
<td>2010</td>
<td>82</td>
<td>18</td>
</tr>
<tr>
<td>2011</td>
<td>86</td>
<td>10</td>
</tr>
<tr>
<td>2012</td>
<td>93</td>
<td>12</td>
</tr>
<tr>
<td>2013</td>
<td>96</td>
<td>20</td>
</tr>
</tbody>
</table>
Research of Medical School

Institutes: 28 in campus and hospitals
Key laboratories: 23 (1 at the national level)

Research space in main campus:

100 PI units with 500,000 feet
Principal investigators (PI): 60
Animal center: 86,000 feet\(^2\)
Research of Medical School

Strengths in Research

- Infectious Disease
- Organ Transplantation
- Surgical Technology
- Oncology
- Pediatrics
- Reproductive Medicine
- Hematology
- Emergency Medicine
- Environmental Health
- Pathology
- Immunology
- Neuroscience
- Cell Biology
## Research of Medical School

<table>
<thead>
<tr>
<th>Year</th>
<th>NSFC grants</th>
<th>Funds (millions RMB)</th>
<th>International Papers (SCI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>2</td>
<td>4.99</td>
<td>15</td>
</tr>
<tr>
<td>2003</td>
<td>29</td>
<td>47.5</td>
<td>130</td>
</tr>
<tr>
<td>2004</td>
<td>49</td>
<td>62.7</td>
<td>162</td>
</tr>
<tr>
<td>2005</td>
<td>41</td>
<td>72.2</td>
<td>198</td>
</tr>
<tr>
<td>2006</td>
<td>69</td>
<td>87.3</td>
<td>257</td>
</tr>
<tr>
<td>2007</td>
<td>75</td>
<td>123</td>
<td>428</td>
</tr>
<tr>
<td>2008</td>
<td>93</td>
<td>142</td>
<td>550</td>
</tr>
<tr>
<td>2009</td>
<td>127</td>
<td>241</td>
<td>728</td>
</tr>
<tr>
<td>2010</td>
<td>170</td>
<td>476</td>
<td>820</td>
</tr>
<tr>
<td>2011</td>
<td>230</td>
<td>345.90</td>
<td>860</td>
</tr>
<tr>
<td>2012</td>
<td>261</td>
<td>490.55</td>
<td>1097</td>
</tr>
</tbody>
</table>
Research of Medical School

Original Papers with high impact

2012

2013
Research of Medical School

The Institutes for Translational Medicine

- nervous and mental diseases
- gastrointestinal cancer
- cardiovascular diseases
- reproductive and genetic medicine
- ophthalmology
- hematology and stem cell

Priority fields in both basic and clinical research
Affiliated Hospitals

- The First Affiliated Hospital
- The Second Affiliated Hospital
- Sir Run Run Shaw Hospital
- Women’s Hospital
- Children’s Hospital
- Dental Hospital
- Yiwu Hospital
## Affiliated Hospitals

### Hospital Beds

<table>
<thead>
<tr>
<th>Affiliated Hospital</th>
<th>Beds (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The 1st Hospital</td>
<td>2500 (2945)</td>
</tr>
<tr>
<td>The 2nd Hospital</td>
<td>2000 (3200)</td>
</tr>
<tr>
<td>Sir Run Run Shaw Hospital</td>
<td>1200 (2400)</td>
</tr>
<tr>
<td>Woman’s Hospital</td>
<td>1120 (1120)</td>
</tr>
<tr>
<td>Children’s Hospital</td>
<td>1000 (2250)</td>
</tr>
<tr>
<td>Dental Hospital</td>
<td>50 (50)</td>
</tr>
<tr>
<td>Yiwu Hospital (under construction)</td>
<td>0 (800)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7870 (12765)</strong></td>
</tr>
</tbody>
</table>

* The predicted bed number in 2015
## Affiliated Hospitals

<table>
<thead>
<tr>
<th>Year</th>
<th>Income (billion RMB)</th>
<th>Inpatients (10^4)</th>
<th>Outpatients (million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>0.945</td>
<td>5.34</td>
<td>2.9000</td>
</tr>
<tr>
<td>2006</td>
<td>3.651</td>
<td>17.52</td>
<td>6.4030</td>
</tr>
<tr>
<td>2007</td>
<td>4.183</td>
<td>19.51</td>
<td>7.2153</td>
</tr>
<tr>
<td>2008</td>
<td>5.191</td>
<td>21.79</td>
<td>8.0775</td>
</tr>
<tr>
<td>2009</td>
<td>6.233</td>
<td>23.69</td>
<td>7.9791</td>
</tr>
<tr>
<td>2010</td>
<td>6.967</td>
<td>27.43</td>
<td>8.6327</td>
</tr>
<tr>
<td>2011</td>
<td>7.73</td>
<td>30.9</td>
<td>10.146</td>
</tr>
<tr>
<td>2012</td>
<td>8.845</td>
<td>36</td>
<td>11.1146</td>
</tr>
</tbody>
</table>
The First Affiliated Hospital

- Founded in 1947
- > 3000 staff members
- 83,017/year inpatients
- 2,599,300 / year outpatients
- JCI (Joint Commission international) accredited, Feb 2013
The First Affiliated Hospital

• Featured Departments (1)
  – The Department of Infectious Diseases

H7N9 Bird Flu
The First Affiliated Hospital

• Featured Departments (2)
  – The Liver Transplantation Center

Prof ZHENG Shusen and his team successfully completed 3 cases of live-donor liver transplantation in Jakarta, Indonesia
The First Affiliated Hospital

- Featured Departments (3)
  - Kidney Disease Center
The First Affiliated Hospital

- Featured Departments (4)
  - Bone Marrow Transplantation Center
The Second Affiliated Hospital

- Founded in 1869
- 2342 staff members
- 68,453/year inpatient
- 1,923,271/year outpatient
- JCI accredited Feb 2013
The Second Affiliated Hospital

- Featured Departments
  - PET Center
The Second Affiliated Hospital

- Featured Departments
  - The Emergency Center
The Second Affiliated Hospital

• Featured Departments
  – The Cardiology Center

Prof Wang Jian’an in Hybrid operation room
Aug 24 2011, Dr William Oppenheim from UCLS provides tele-consultation for a girl (Niuniu) who fell from 10th floor.
Sir Run Run Shaw Hospital

- Third Affiliated Hospital
- Founded in 1994
- Established with Loma Linda University
- 2,218 staff members
- 49,508/year inpatient
- 997,966/year outpatient
- Accredited JCI in 2006
Dr Cai Xiujun and his team performed more cases of laparoscopic hepatectomy in single institute than others in the world (3D laparoscopy)
Sir Run Run Shaw Hospital

- Heart Center- Hybrid Operation room

Hybrid Operation room
Founded in 1951
934 staff members
38,964/year inpatients
1,092,171/year outpatients
One of biggest women’s hospital in China
Children’s Hospital

- Founded in 1951
- 1421 staff members
- 33,857/year inpatients
- 1,124,000/year outpatients
- One of biggest children’s hospital in China
Dental Hospital

- Founded in 1991
- 238 staff members
- 500/year inpatients
- 200,000/year outpatients
New Hospitals: Yiwu Hospital

- Founded in Dec. 2009
- To open at the end of 2013
- 12.6 hectares
- 800 beds (stage 1)
New Hospitals: Medical Center

- To open at the end of 2016
- 20 hectares
- Clinical Unit: 1200 beds
- Research Unit: 100,000 m²
New Campus of Affiliated Hospitals

Binjiang Campus
of Children’s Hospital
1250 beds

Xiasha campus
of 2nd Affiliated Hospital
1200 beds

Xiasha campus
of 3rd Affiliated Hospital
1200 beds
Challenges for Medical Education & Research

1. How to Teach students in Future?
   - MOOC (massive online open courses)
   - Reorganization of medical education systems
   - Why do we still need teachers

2. New Paradigm of Medical Research in “Big Data” Era?
   - Systems medicine (Med-X)
   - Hypothesis-driven research
   - Data mining or meta-analysis

3. How to Prepare for the Globalization of Medicine?
   - How to make international collaboration efficiently
   - Authorship in big project with international collaboration
   - Medical students in international collaboration
Thanks!