UESTC

A Brief introduction for School of Life Science and Technology (SLST)

Contents

- History and Scale of SLST
- Mission, Vision and Goals of SLST
- Statistics and Achievements of SLST
- Action Plans
- New Project
- Summary

Building for Life Science

787/1412 Py

SLST

2001

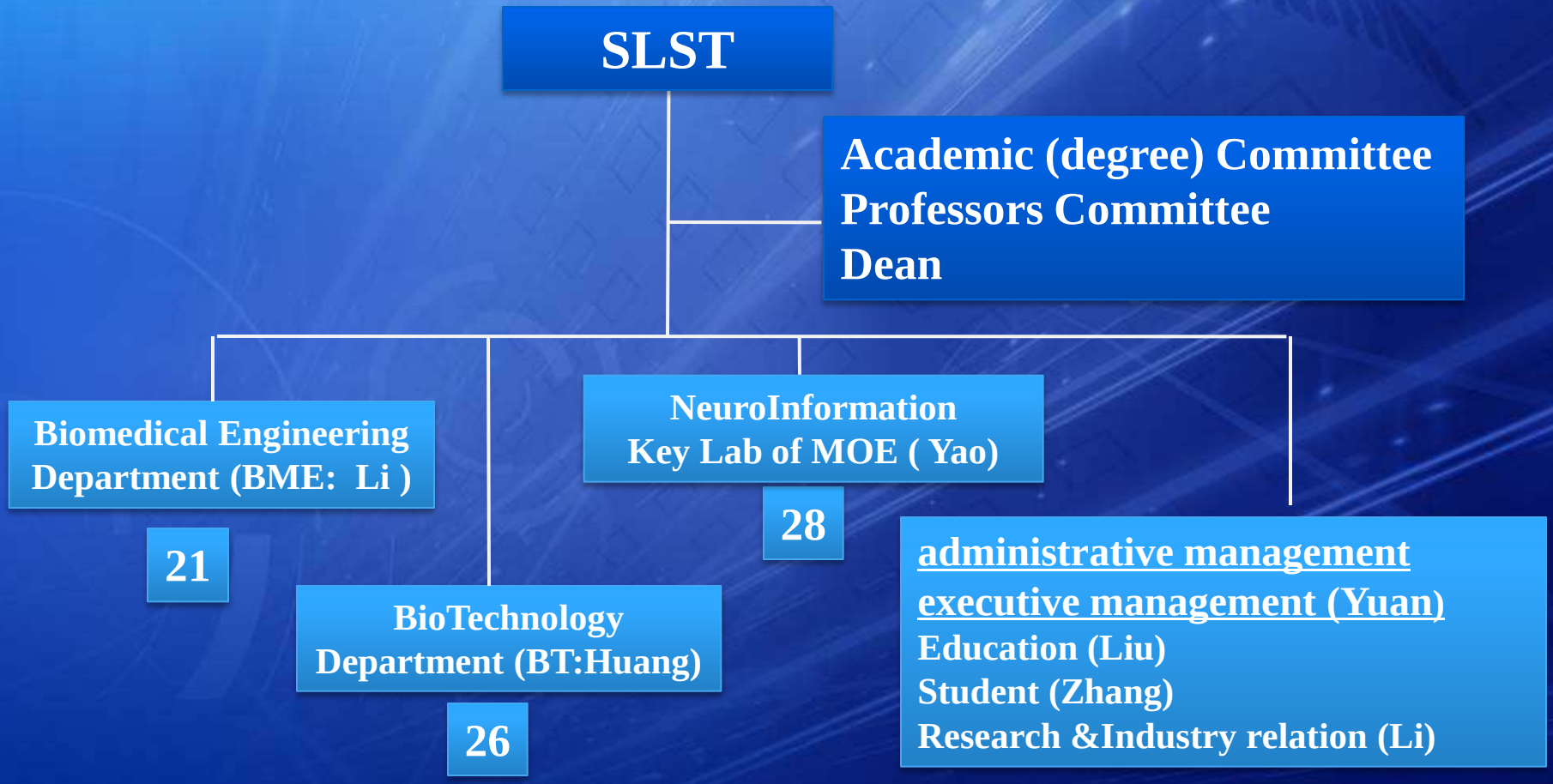
established

ShaHe Campus (1956-)

Academic Statistics

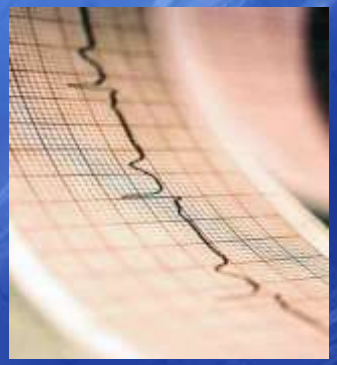
	SLST of UESTC
Faculty	60
Enrollment	BS 152/ MS 92/ Ph.D 18 (2010)
Graduates	BS 149/MS 81 /Ph.D 17 (2010)
Research Fund	10 million(RMB) (2010)

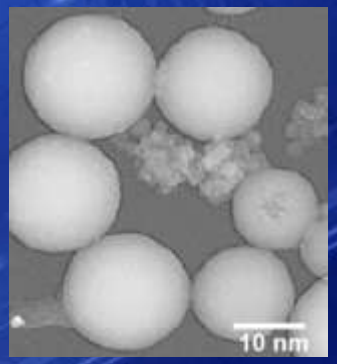
Organization of SLST

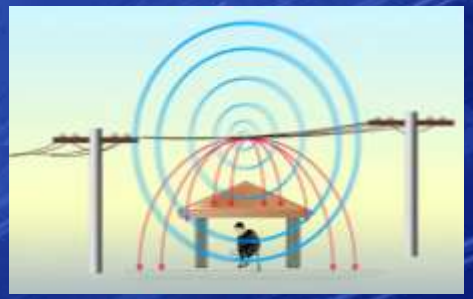


Biomedical Engineering Department

- Ultrasonic Medical Instruments
- Medical information system
- Cardiac information mimics
- Bioelectromagnetic effect
- Biomechanics
- Nano-biomaterials
- Bio-Electronics
- Medical Image Processing
- …..

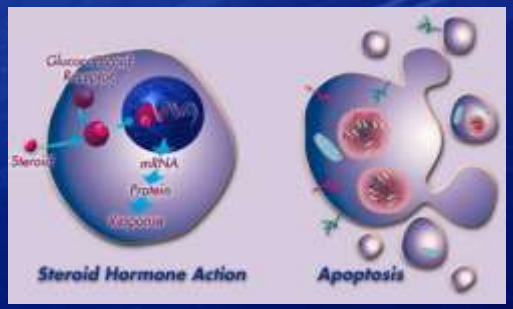






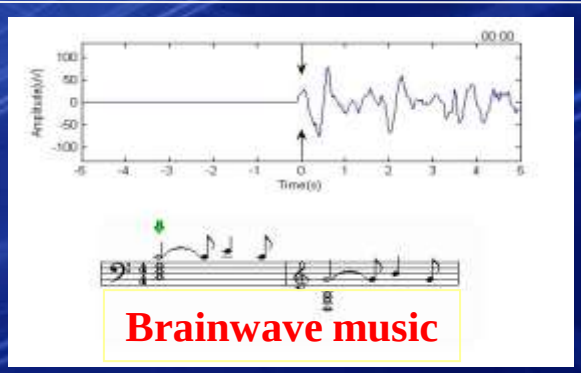
BioTechnology Department

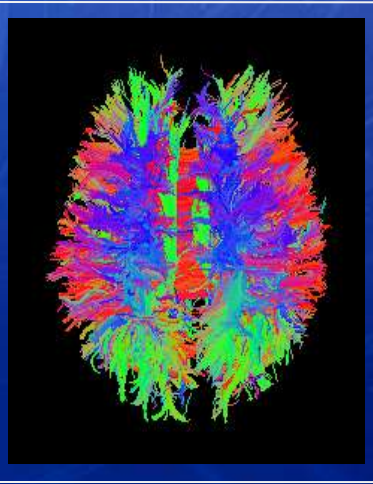
- Molecular Biology and Plant genetic seeding
- Protein Engineering
- Potato and bioenergy
- Bioinformatics
- Molecular neurobiology
- Molecular endocrinology
- neuroimmunology

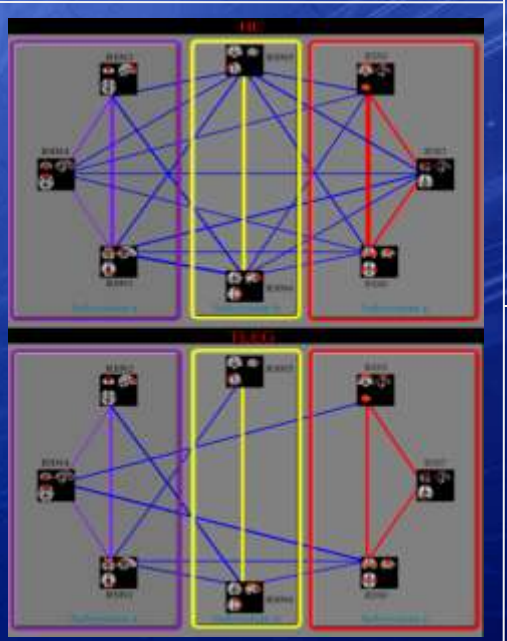


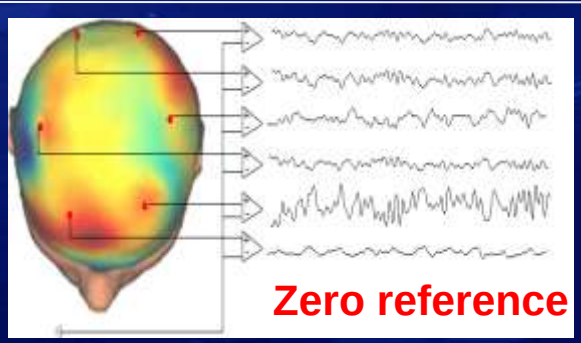
NeuroInformation, Key Lab of MOE

- EEG and Brain-computer interface
- Brain Imaging (MRI/DTI/fMRI,..)
- Neural coding
- Brain Connectome
- Visual mechanism and Modelling
- Attention and eye movement
- Music cognition









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Mission Statements (Grad.)

Foster Outstanding Students in BT & BME (M.S & PhD)

with

- **Creativity**
- **Adaptation**
- **Social Responsibility**
- **Effective Communication**

Mission Statements (Undergrad.)

BT Students with Information Science Knowledge

to be

- **Effective Communication Skill**
- **Information Technology Skilled**
- **Understand Life With Information theory**
- **Fundamental BT Knowledge**

Mission Statements (Undergrad.)

BME
Electrical Engineering Students with Biomedical Knowledge

to be

Effective Communication Skill

Comprehend human anatomy structure

Understand Information Process in Life

Fundamental Electrical Engineering Knowledge

Vision Statements

World-Level SLST

- possesses world-class faculty and outstanding students
- provides break-through science and technologies for a better quality of life

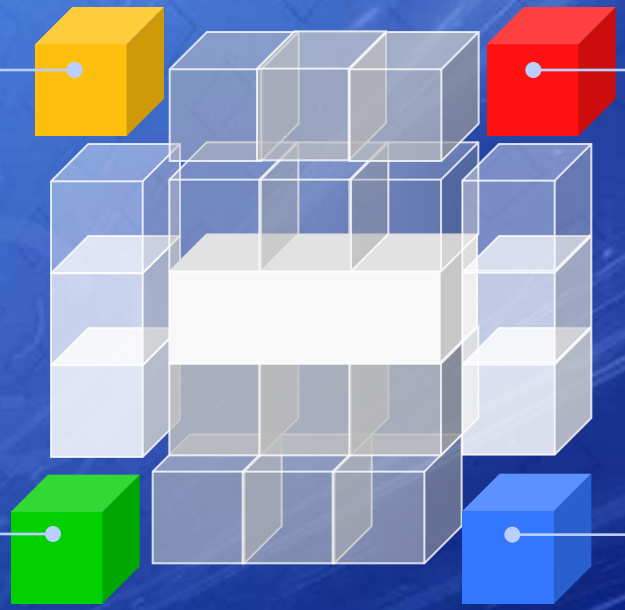
Mission

-Foster Outstanding BT and BME Students

Goals in 2020

Neural Engineering

Medical Informatics



Plant Genetics Bio-energy

Protein engineering

Strengthen the global competitiveness in our area

Goals in 2020

Faculty

72-120

Foreign faculty: 10-20%

Researcher, PostDoc: 60

Students

MS Sudent80→200/year

PhD Students 30→80/year

Bachelors 150/year

Foreign students 20%

Funding

10 Millions→ 50 millions

Additional Space

4000square meters

-> 15000 square meters

Strengthen the global competitiveness in our area

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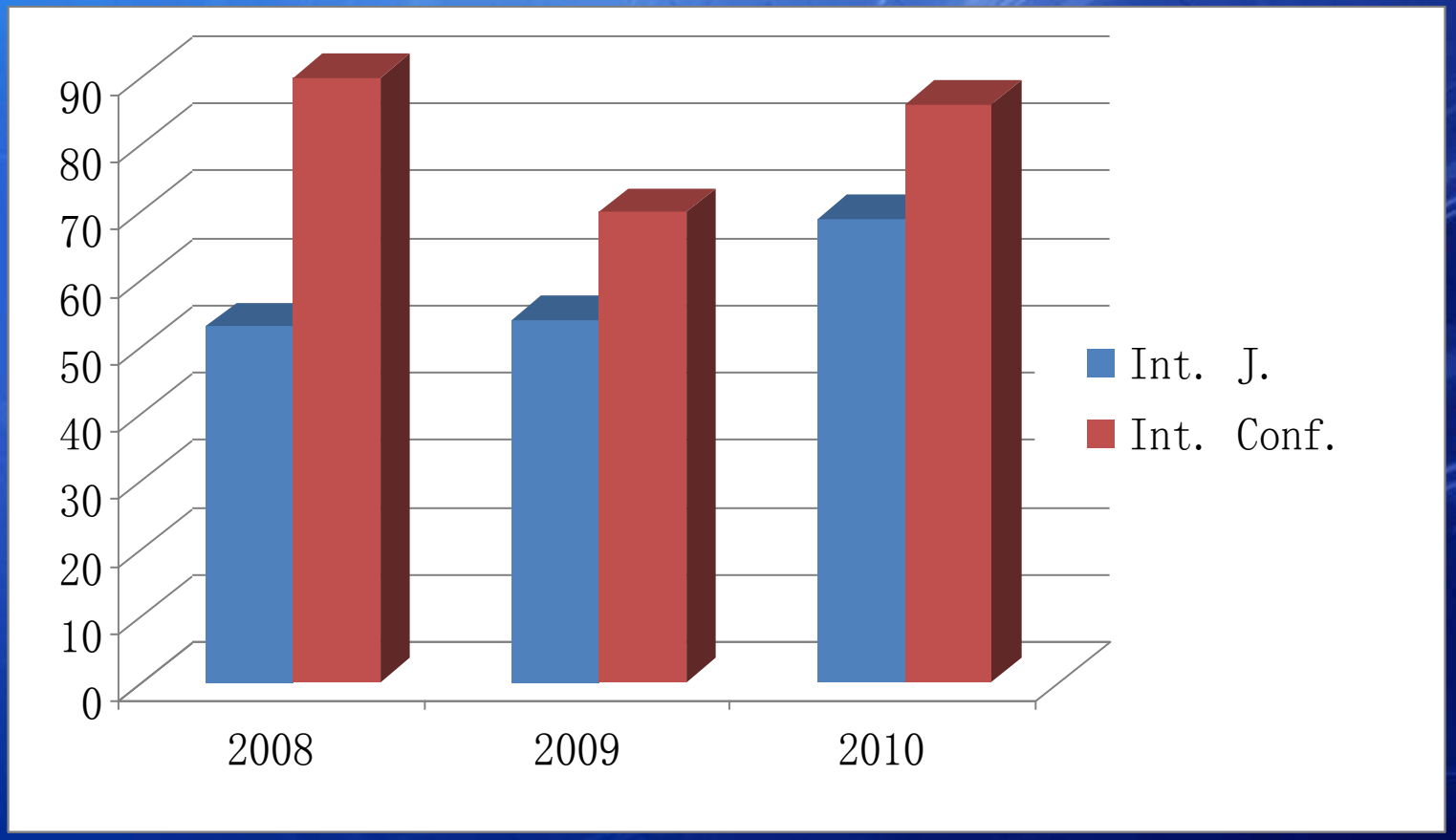
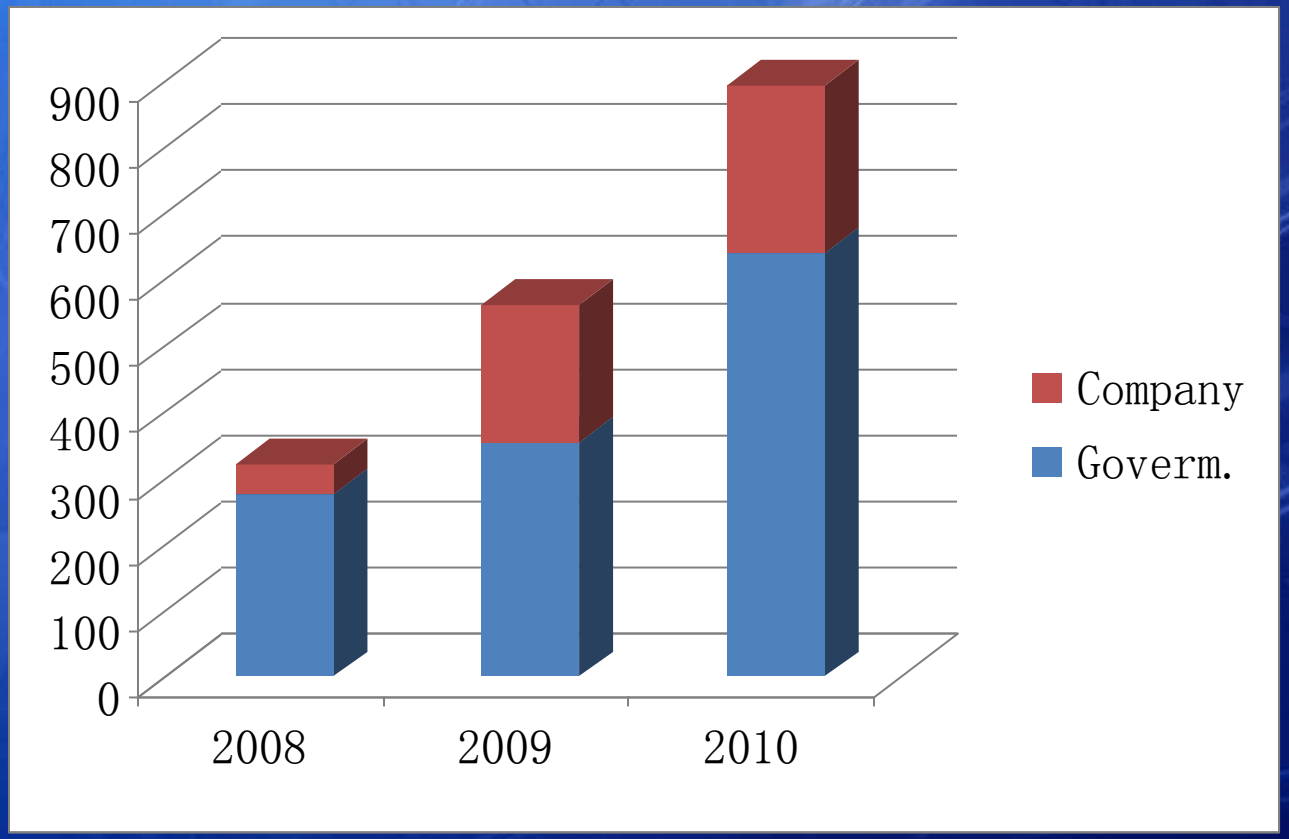
Publications in 2008~2010



Research Funding (then thousands) in 2008~2010



Achievements

- World first observation of separate codon Usage associated with DNA replication in plasmids (F.B. Guo)
- World first high-starch GM sweet potato using sucrose transport control. (X.L. Zheng)
- World first introduced new alien chromatin from *Dasypyrum breviaristatum*, *Secale africanum*, *Thinopyrum trichoporum* to common wheat.(Z.J.Yang)
- World first cluster models for systematic internal rotation in molecular crystals (X.I. Wang)
- World first the theory of nonlinear quantum mechanicsand the mechanism and theory of mechanism of bio-photon emision were proposed (Xiao-feng Pang)
- World successully the theory of bio-energy transport and the mechanism and theory of biological effect of magnetic-field in life systems were proposed (Xiao-feng Pang)
- world's first systematic investigation of properties of nonclassical receptive field in cat's visual cortex(Y.C.Cai)
- World first freely accessible web tool for mimotope-based epitope mapping (J. Huang)
- World largest mimotope database (J. Huang)
- Scale free music of the brain (Wu)
- L0 norm EEG inverse (Xu Peng)
- Zero-reference for EEG (Yao DZ)
- Non-linear causal network of the brain (Chen HF)
- ……

SLST (Under)
(Bachelor students admitted)

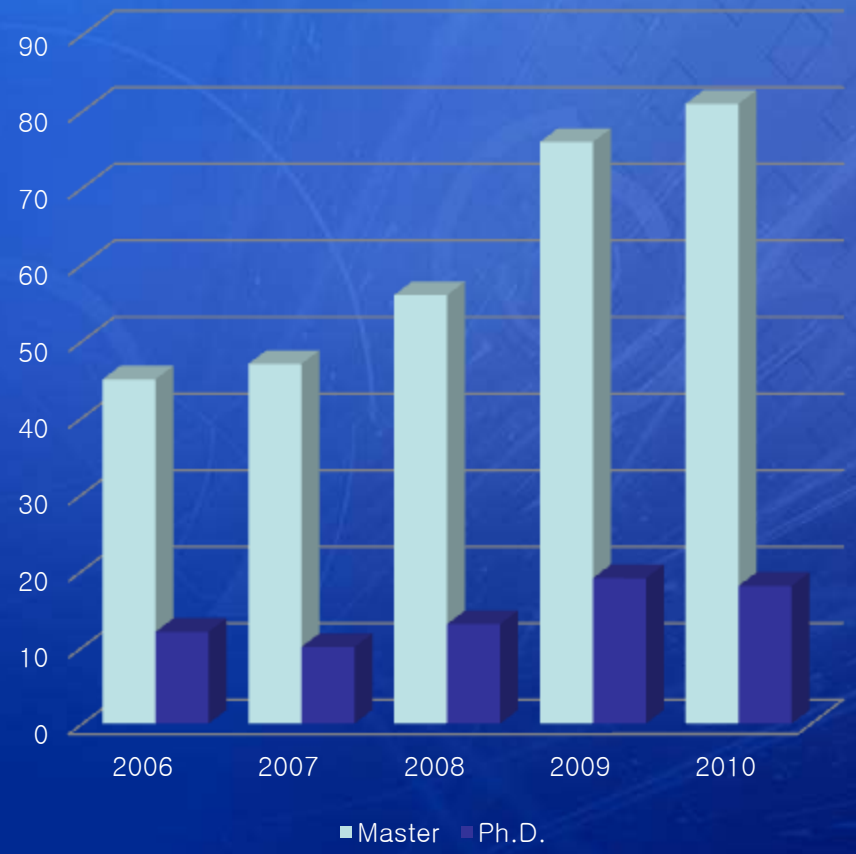
Under- Academic Paper pub (2010)

Li Shiyong	SAROTUP: Scanner And Reporter Of Target-Unrelated Peptides	Journal of Biomedicine and Biotechnology
Li Shiyong	MimoDB: a new repository for mimotope data derived from phage display technology	Molecules (Basel, Switzerland)
Chen Rui	Effects of redox state of disulfide bonds on the intrinsic fluorescence and denaturation of Trx-fused Gibberellin-induced cysteine-rich protein from Gymnadnia conopsea	Spectroscopy and spectral analysis
Chen Rui	Application of polarization fluorescence to study the effect of darkeness on the wheat chloroplast	Spectroscopy and spectral analysis
Chen Rui	Studies of intrinsic fluorescence in the process of acid cleavage of Trx-fused g-thionin from Gymnadnia conopsea	Spectroscopy and spectral analysis
Tong Hao	Automatic prediction of non-coding RNA genes in prokaryotes based on compositional statistics	Journal of Theoretical Biology
Zhang Xianliang	Prediction of subchloroplast locations of proteins using pseudo and composition	Current Proteomics
Li Shijie	Relationship of Mean Protein Sequence Entropy with Whole Genome ORF Prediction Accuracy for Bacteria Genomes	ICCEE 2010

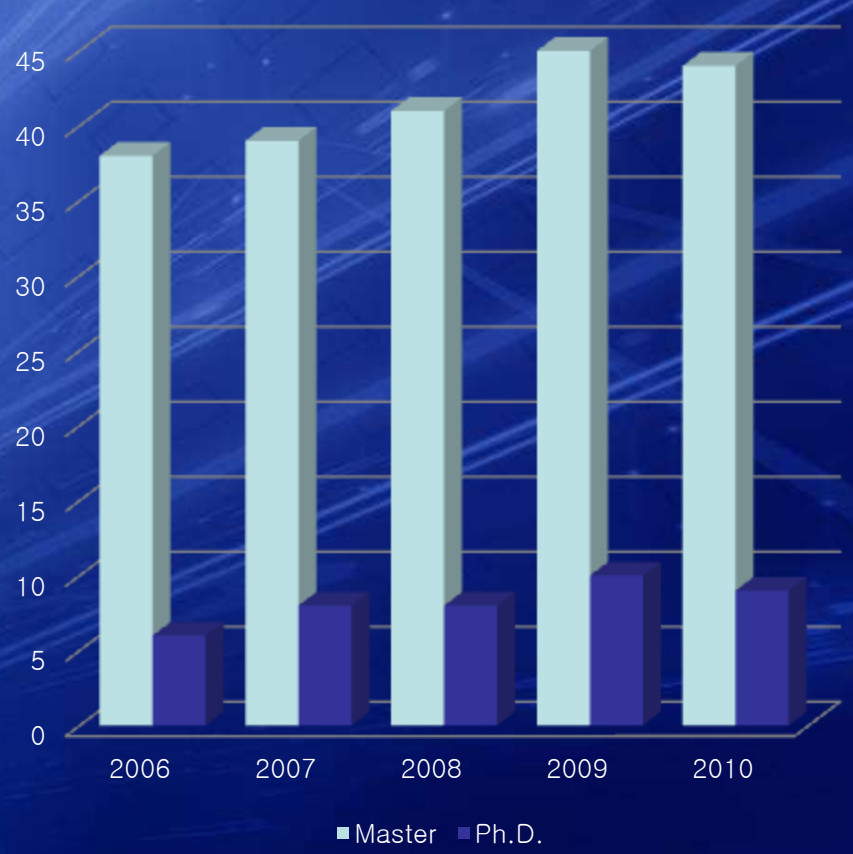
Students

Admitted & Graduated in 2006~2010(Master and Ph D students)

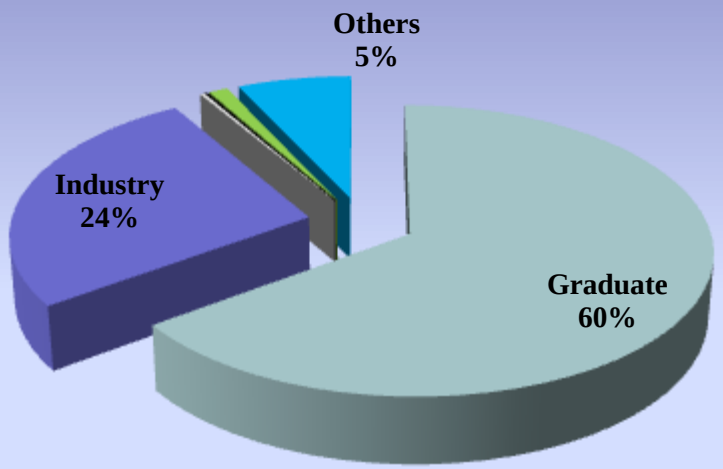
Admitted



Graduated

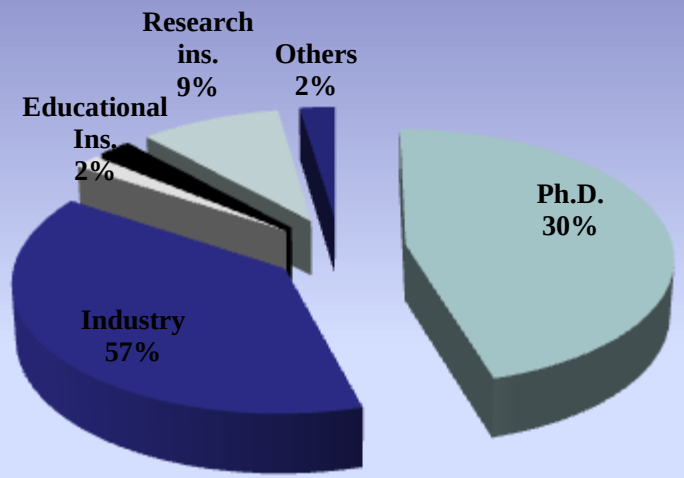


Posts After Graduation



B.S.Students[June.2006-June.2010]

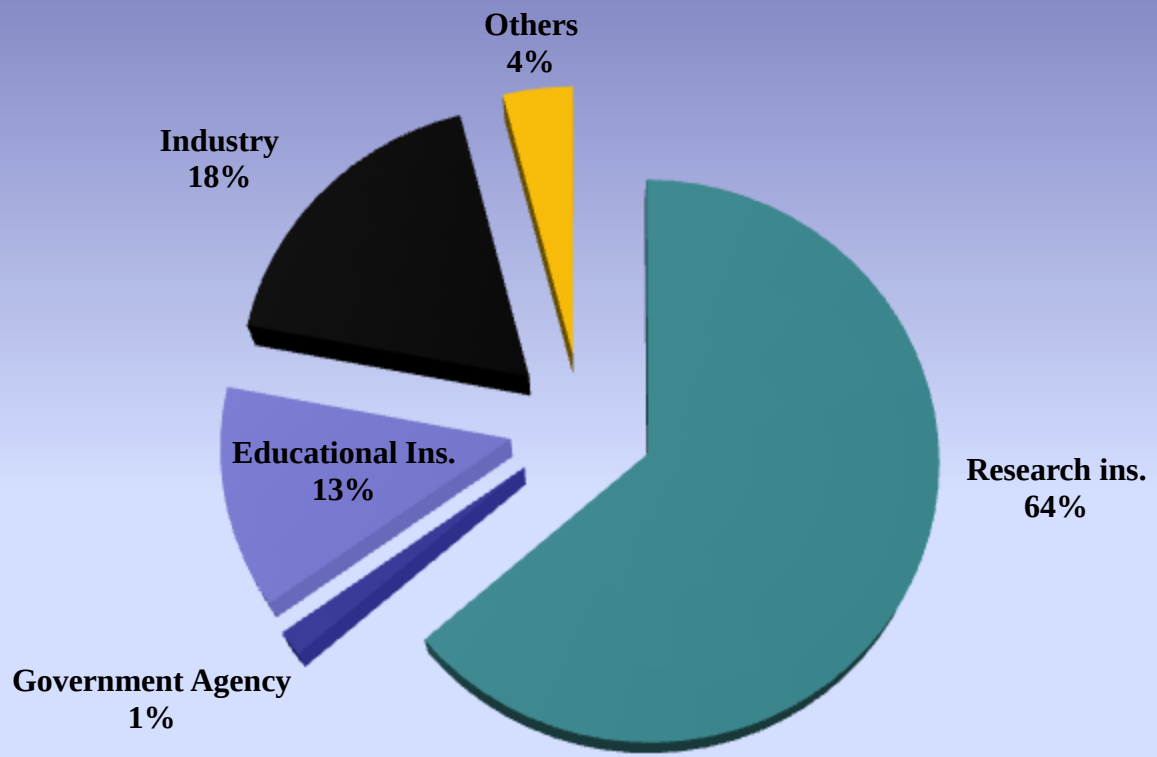
Bechelors



M.S.Students [June.2006-June.2010]

Masters

Posts After Graduation



Ph.D. Students [June.2006-June.2010]

Laboratories and Directors

Professor	Research aspects	Professor	Research aspects
Dezhong Yao	Biomedical Signal Processing (Key Lab, Ministry of Information)	Hong Zhou	Neuro-Endocrine
Chaoyi Li	Visual Mechanism	Zili You	Neuro-immune
Yongjie Li	Visual Modeling	Zheng Guo	systems biology
Huafu Chen	NeuroImaging	Jian Huang	Immune Informatione
Tianzi Jiang	Computational Medicine (LIAMA-UESTC)	Zujun Yang	plant genetics
Nini Rao	Cardiac Imaging	Yiyao Liu	Nano-biomaterial
Ke Li	Medical Information system ((Key lab, Sichuan Province)	Peng Xu	Brain-computer interface
Xiaofeng Pang	Electromagnetic life effect (Key Lab, Sichuan province)	Fengbiao Guo	Bioinformatics

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Action Plans--Education

1. Curriculum for undergraduates

Type of Courses		Credits	Percentage in Total Credits
Basic Courses	Required	63.5	37.2%
	Quality Education	6	3.5%
Basic course in Discipline		50	30.5%
Courses in Specialty	Key Courses	11	6.5%
	Elective Courses	19	11.1%
Practice and Training		15	8.9%
Creative credits		4	2.3%
Total		168.5	100%

Action Plans--Education

Acknowledge structure outline for Biomed Engineering

Key courses

Circuit Analysis, Signals and System, Medical Informatics, Digital Image processing, Bioinformatics, Human Anatomy, Physiology , Computer Science, Analog Circuit

Bio-electronic Instrumentation

Medical Ultrasound Technology, Medical Instruments Principles, Medical Imaging Technologies, Biomedical Signal Processing, EDA Technologies, Medical Instrument Design, chip Theory and Application

Bio-med-Informatics and Software

Computer Network, Computer Operating System, Database Technologies, Data Structure, C++ Programming Language, Numerical Computation & matlab

Anatomy
Physiology
Molecular Biology

Action Plans--Education

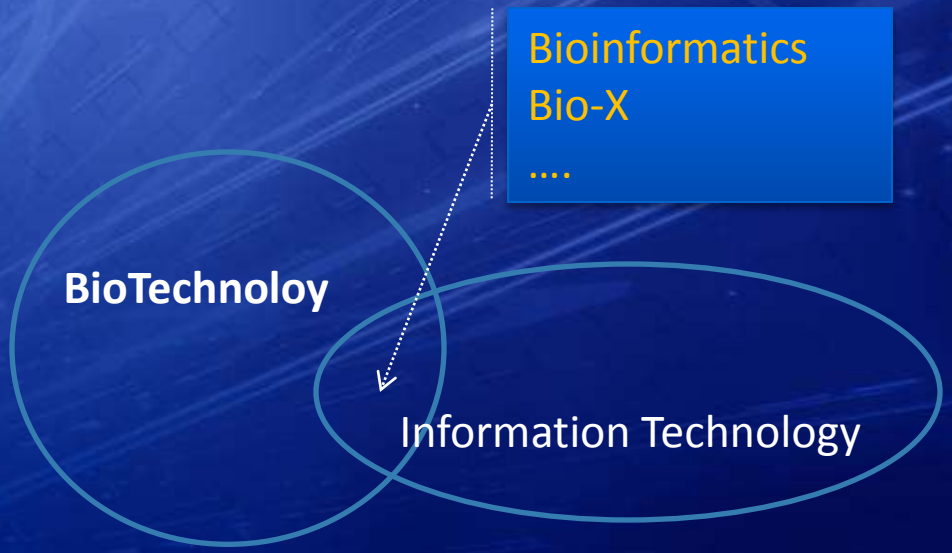
Acknowledge structure outline for BioTechnology

Key courses

Biochemistry, Molecular Biology, Genetics, Cell biology, General Biology, Microbiology, Fermentation Engineering, Immunology, Genetic Engineering, Biotechnological Pharmaceutics , Bioinformatics, Biophysics, Structure Biology

Our attentions

Stress Biological Fundament With knowledge of Information Technology Emphasize Practice and Application



Master Degree Requirements

At least 26 credits needed (including 24 course credits)

- **Common mandatory (5)**
- **Major mandatory (12)**
- **Electives > 7**
- **Research/Practice (2)**

Period: 2.5 or 3 year, not beyond 4 year

Tuition fee: 8000 RMB/year

Scholarship:

-First-class (30%): 8000 RMB/year

-Second-class (30%): 6000 RMB/year

-Third-class (20%): 4000 RMB/year

Beyond 3 three year, no scholarship

Action Plans--Education

Ph.D Degree Requirements

- Average study period
  - 3 years to 6 years (limited)
- Tuition fee: 10000 RMB/year
- Scholarship: about 1700 RMB/month

  (no scholarship for 4th and higher students)

At least 14 credits needed (including 12 course credits)

- Common mandatory (4)
- Major mandatory > 4
- Electives > 6
- Research/Practice (2)

Action Plans--Education

Research directions (not limited) for Ph.D

Neuroinformation Engineering (EEG, fMRI, BCI)
Medical imaging and processing
Bioelectromagnetics
Bioinformatics and System Biology
Signal transduction and gene expression
Molecular neurobiology
Biomechanics
Nanomedicine
Neuro-Endocrine

….

Action Plan: Faculty

- **Strengthen our areas**
  - NeuroImaging
  - Brain-Computer Interface
  - Plant gentic seeding
  - Nano-biology
  - Bioinformatics
- **Expand new areas**
  - Neuroscience
  - Bio-energy

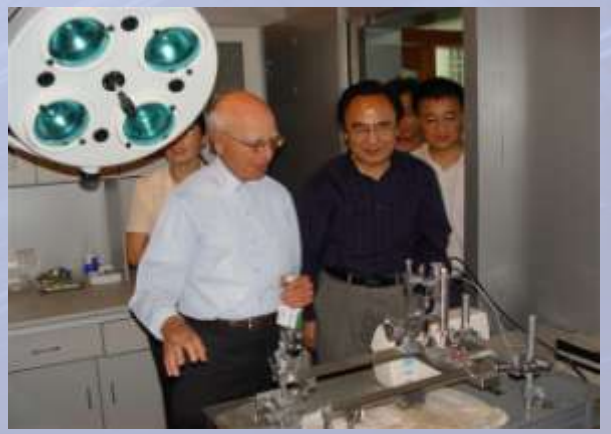
Action Plan: Globality

- **Foreign faculty**
  - 5% → 20%
  - Recruit world-class senior faculty and promising junior faculty
- **Foreign students**
  - → 10-20%
  - From worldwide (most from asia area)
  - Recruit excellent students
- **Promoting international activity**
  - Editorial, Committee, Invited talk, …
- **Dual degree program**
- **Joint Program**

Action Plan: Globality

Joint Research Center (LIAMA) (China- French)

Action Plan: Globality



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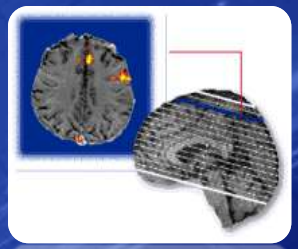
(1) Brain Connectome

From Imaging to Network

Bold Network

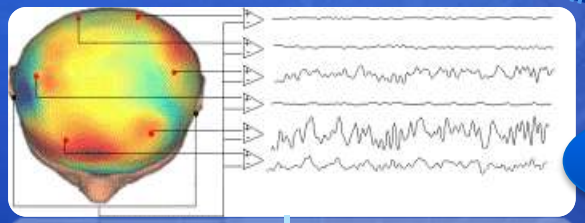


SPM/ICA

EEG-informed SPM

NESOI

3SCO



Brain Network
(spatio-temporal)

Scalp Network
(REST)

3T MRI system

(2) Nanomedicine and Cell Biomechanics

Vascular disease (AS)

Cancer metastasis

Molecular mechanism

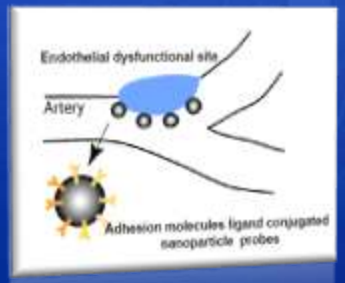
Biomarkers / targets

Nanomedicine/ Nanobiotechnology

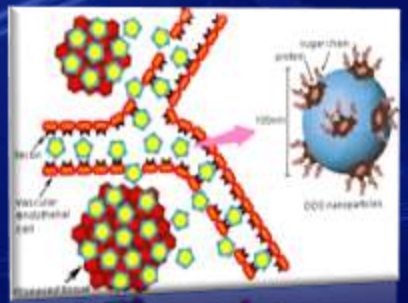
Molecular Imaging (diagnosis)

Drug/gene delivery (therapy)

Diagnosis and imaging for diseases



Targeted DDS for diseases



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Summary

- **Education**
  - Curriculum: Breadth, Depth, and BT-IT cross
  - Focus fundamental and ability
- **Research**
  - High-risk high-return, Technology innovation
  - World-class faculty and foreign students
  - International visibility
- **Action Plan**
  - **Brain connectome**
  - **Nano-biomaterials and Biomechanics**

Welcome !

Thank You !