



THE BEUTLER INSTITUTE



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Bruce Alan Beutler

Director, Center for the Genetics of Host Defense, University of Texas Southwestern Medical Center in Dallas, Texas, USA

The Beutler Institute

The Beutler Institute is established and named in honor of Dr. Bruce Beutler, 2011 Nobel Prize winner in Physiology or Medicine. The Institute is located in Xiang'an campus of Xiamen University. It is affiliated with the Innovation Center for Cell Signaling Network, jointly established by Xiamen University, Zhejiang University, University of Science and Technology of China, Institute of Biochemistry and Cell Biology of Chinese Academy of Science and WuXi AppTec. Committed to the cultivation of outstanding talents in the field of life sciences, the Institute serves as a unique platform which offers unparalleled opportunities for promising students and prepares them for future achievement.

From 2015 onwards, the Institute will start annual recruitment of outstanding third year undergraduates from Xiamen University, Zhejiang University and University of Science and Technology of China. The Institute will offer students an elaborately designed program which mainly consists of two sessions: a semester of core courses study in Xiamen University and a 6- to 12- month period of scientific training (B.S. thesis research) at UT Southwestern Medical Center, Xiamen University, Zhejiang University, University of Science and Technology of China, Institute of Biochemistry and Cell Biology of Chinese Academy of Science or WuXi AppTec. Students who excel in the final assessment will be recommended to pursue further study at UT Southwestern Medical Center or in one of the five core partners of the Innovation Center.

THE INNOVATION CENTER FOR CELL SIGNALING NETWORK

The Innovation Center was established in August of 2012. Currently, it is jointly sponsored by Xiamen University, Zhejiang University, University of Science and Technology of China, Institute of Biochemistry and Cell Biology of Chinese Academy of Science and WuXi AppTec. The Innovation Center is the hub of distinguished Chinese scientists in the field of biomedical science. The research interests of the Center lie in the following four areas: cell proliferation and differentiation, cell survival and death, cell metabolism, and cellular stress and homeostasis. The goal of these studies is to understand the molecular mechanisms of physiological and pathological processes at the cellular level and their relation to human health and to explore new treatments of human diseases.



细胞信号网络协同创新中心
Innovation Center for Cell Signaling Network

The University of Texas Southwestern Medical Center

The University of Texas Southwestern Medical Center (UT Southwestern), established in 1943, is one of the leading medical education and biomedical research institutions in the United States. The medical center includes three degree-granting institutions/schools: UT Southwestern Medical School, UT Southwestern Graduate School of Biomedical Sciences, and UT Southwestern School of Health Professions.

All of UT Southwestern Medical Center's activities are directed toward the goal of educating the next generation of leaders in patient care, biomedical science, and disease prevention. UT Southwestern's faculty has many distinguished members, including six Nobel Prize recipients since 1985.



Xiamen University

Xiamen University was founded in 1921 by Tan Kah Kee, the well-known patriotic overseas Chinese leader. It was the first university in China founded by an overseas Chinese. The school motto is "Pursue Excellence, Strive for Perfection." The University is a comprehensive research university with distinctive features and a national as well as international impact. Since its founding, Xiamen University has produced more than 200,000 undergraduates and graduates for the country and over 60 academicians of the Chinese Academy of Sciences (CAS) and the Chinese Academy of Engineering (CAE) have studied or worked at Xiamen University.



Zhejiang University

Zhejiang University is a prestigious institution with a long history. Qiushi Academy, the predecessor of Zhejiang University, was founded in 1897 and was one of the earliest modern academies of higher learning established in China. Praised by the famous British scholar Joseph Needham as the “Cambridge of the East,” Zhejiang University has long held the educational philosophy of putting people foremost, cultivating all-round competence in students, seeking the truth and pioneering new trails in search of excellence, and is committed to developing future leaders with an international perspective. As of now, there have been more than 160 alumni elected members of Chinese Academy of Sciences and Chinese Academy of Engineering.



University of Science and Technology of China

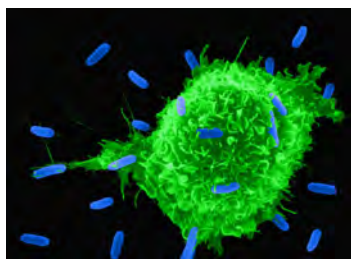
The University of Science and Technology of China (USTC) was established by the Chinese Academy of Sciences (CAS) in 1958. USTC is regarded in China as the “Cradle of Scientific Elites.” It is a prominent university in China and enjoys an excellent reputation worldwide. USTC's mission has been to “focus on frontier areas of science and technology and educate top leaders in science and technology for China and the world.” Central to its strategy has been the combination of education and research, as well as the emphasis on quality rather than quantity. Its educational principle emphasizes fundamental theories and provides students with a wide range of high-level training that incorporates newly emerging as well as interdisciplinary fields of study. It upholds the combination of science with technology, teaching with research, and theory with practice. In a short period, USTC has turned into a comprehensive national key university of science and technology, with emphasis on the forefront of science and high and new technology.



Training Program

Four academically stimulating courses are designed for 3rd year undergraduate students in their spring semester: Immunity, Mammalian Genetics and its Applications, Signal Transduction and Pathophysiological Implications, and Scientific Writing and Oral Presentation. The total credits of the courses amount to 20. Each course has 5 credits. The Institution will generate a transcript and the credits earned can be transferred back to the students' home university and accepted for degree application.

Upon the completion of the courses, the students will conduct their B.S. thesis studies (6 to 12 months) at UT Southwestern Medical Center, Xiamen University, Zhejiang University, University of Science and Technology of China, Institute of Biochemistry and Cell Biology of Chinese Academy of Science or WuXi AppTec. When the thesis is completed, students will return to their home university for thesis defense and B.S. Degree application.



Immunity

This course aims at providing students with the essential concepts of immunology and encouraging critical analysis in the diagnosis, interpretation and discussion of immunological diseases. Topics to be covered include: a) microbes and epidemiology; b) the evolution of the immune system, and model systems for the study of immunity; c) the ontogeny of the immune system; d) the innate immune system; e) the adaptive immune system; f) self/non-self discrimination; g) mechanisms of host evasion.

Teaching on the subjects of immune deficiency, autoimmunity, autoinflammation, genetics and the analysis of immunity, and medical interventions will be included to inform the students of examples from nature that have led to immunological principles.

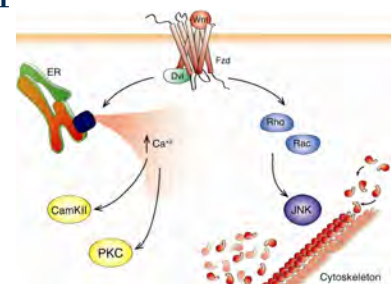
Mammalian Genetics and its Applications

This course centers on the fundamental principles of mammalian genetics, the latest achievements in molecular genetics and the common research techniques in the field. The contents include: a) mammalian evolution and the diversity of mammalian genomes; b) epigenetics, imprinting, and sex determination; c) mammalian development; d) mammalian physiology and pathology; e) mammalian immunity; f) cancer; g) aging. Basic principles of heredity will also be revisited, alongside discussion of the most modern methods used to probe heredity: gene targeting, gene trapping, conditional knockouts, mutagenesis, and forward genetics.



Signal Transduction and Pathophysiological Implications

This course will explore different types of signaling pathways activated by receptor-ligand interactions. Topics to be covered include, but are not limited to: G-protein linked receptors, adenylate cyclases, small GTPases, kinases and phosphatases, nitric oxide, phospholipases, steroid hormone signaling, ubiquitin signaling, and pharmacological applications of signaling pathways. Major disease categories (developmental, autoimmune, cardiovascular, degenerative, metabolic, and neoplastic) will be examined in terms of genetics, pathology, gross and microscopic morphology, and the underlying molecular mechanisms.



Scientific Writing and Oral Presentation

Persuasive speaking and writing in English remain an important requirement for success in science in the 21st century. This course is aimed at developing students' academic writing and public speaking skills to make professional presentations about the progress and results of their work to a scientific audience. The course is to be taught by example. Students will be presented with a scientific story in Chinese, given data, and then instructed to write a paper in English. There will also be a requirement to make slides and deliver a practice lecture on papers in English.



Classes will last three hours, three days per week

Lecturers

The Beutler Institute is an exceptional academic platform where great minds converge. Apart from the distinguished professors of the Innovation Center, Dr. Bruce Beutler has brought in outstanding scholars in the circle of life sciences from all over the world to deliver lectures or give lessons.



Bruce Alan Beutler, M.D.

Director, Center for the Genetics of Host Defense, University of Texas Southwestern Medical Center in Dallas, Texas.

Lecture Topic:

Infection and immunity: the big picture
Innate immunity
Genetic studies of immunity in the mouse

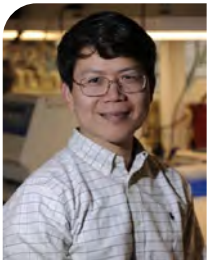


Jean-Marc Reichhart, Ph.D.

Professor, University of Strasbourg
Director, UPR9022, CNRS

Lecture Topic:

Genetic studies of immunity in drosophila



James Chen, Ph.D.

Investigator, Howard Hughes Medical Institute
Professor, Department of Molecular Biology, University of Texas Southwestern Medical Center in Dallas, Texas

Lecture Topic:

Sensing RNA (the RIG-I/MDA5/MAVS story)
Sensing DNA (the cGAS/cGAMP/STING story)



Chris Goodnow, Ph.D.

Head of the Department of Immunology, the Australian National University, Canberra

Lecture Topic:

Adaptive immunity and self-tolerance
Autoimmunity



Pamela C. Ronald, Ph.D.

Professor, Plant Pathology, University of California, Davis
Director of Grass Genetics, Joint Bioenergy Institute, Emeryville

Lecture Topic:

The genetics of plant disease resistance
Developing flood tolerant rice

Lecturers



Lalita Ramakrishnan, M.D., Ph.D.

Professor of Immunology and Infectious Diseases
Wellcome Trust Principal Research Fellow
University of Cambridge

Lecture Topic:

The zebra fish as a model for studying immunity



Jean-Laurent Casanova, M.D., Ph.D.

Investigator, Howard Hughes Medical Institute
Senior Attending Physician, Professor, St. Giles Laboratory of Human
Genetics of Infectious Diseases

Lecture Topic:

Innate immunity in the fruit fly Innate immunity in the fruitfly, *Drosophila*
melanogaster: Toll and the Imd pathway
Antiviral immunity: what we know and what remains unknown



Michel C. Nussenzweig, M.D., Ph.D.

Investigator, Howard Hughes Medical Institute
Zanvil A. Cohn and Ralph M. Steinman Professor
Laboratory of Molecular Immunology

Lecture Topic:

Dendritic cells
HIV



Peter J. Hotez, M.D., Ph.D.

President and Director, Sabin Product Development Partnership
President, Sabin Vaccine Institute and Texas Children's Hospital Center for
Vaccine Development and dean of the First National School of Tropical
Medicine at Baylor College of Medicine

Lecture Topic:

Parasitic diseases
The case of hookworm



Etienne PAYS, Ph.D.

Professor, Universite Libre de Bruxelles

Lecture Topic:

Trypanosomiasis and host resistance
The genetics of resistance and its relation to kidney disease



Lecturers



Yoshihiro Kawaoka, Ph.D.

Professor, Department of Microbiology and Immunology, Institute of Medical Science, University of Tokyo, Japan

Lecture Topic:

Influenza



Jiahuai Han, Ph.D.

Professor, School of Life Sciences, Xiamen University
Director, State Key Laboratory of Cellular Stress Biology
Dean, Faculty of Medicine and Life Sciences, Xiamen University, China

Lecture Topic:

Cellular signaling pathways



Shengcai Lin, Ph.D.

Professor, Dean, School of Life Sciences, Xiamen University

Lecture Topic:

Regulatory Biology



Jinrong Peng, Ph.D.

Professor, Dean, College of Life Sciences, Zhejiang University

Lecture Topic:

Liver development in zebrafish



Xinhua Feng, Ph.D.

Professor, Distinguished Investigator
Director, Life Sciences Institute, Zhejiang University

Lecture Topic:

Proteins modifications and signaling networks in cell growth control, tumorigenesis and development

Lecturers



Tian Xue, Ph.D.

Professor, Dean, School of Life Sciences
University of Science and Technology of China

Lecture Topic:

Neurobiology



Zhigang Tian, Ph.D.

Professor and Director, Institute of Immunology
School of Life Sciences
University of Science and Technology of China

Lecture Topic:

NK cells, liver immunology and major diseases (cancer, infection and autoimmunity)



Mian Wu, Ph.D.

Professor, School of Life Sciences, University of Science and
Technology of China

Lecture Topic:

P53 and tumor metabolism
Non-coding RNA and tumor
Molecular mechanisms of iPS



Xiaolong Liu, Ph.D.

Professor, Director of IBCB, Institute of Biochemistry and Cell Biology,
Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences

Lecture Topic:

Molecular mechanisms of thymocyte development



Marius Sudol, Ph.D.

Associate Professor, Mechanobiology Institute, National University of
Singapore

Lecture Topic:

Scientific writing and oral presentation in English



Scott C. Schuyler, Ph.D.

Assistant Professor, Department of Biomedical Sciences, College of
Medicine, Chang Gung University, Taiwan

Lecture Topic:

Scientific writing and oral presentation in English

Application

Who can apply?

Each year, we will recruit about 30 third-year undergraduates majoring in life sciences or other relevant disciplines from the three partner universities (Xiamen University, Zhejiang University and University of Science and Technology of China). We welcome candidates who have:

- ★ a great interest in the study of life sciences
- ★ a strong consciousness of innovation and an enquiring mind
- ★ strong spirit of teamwork and sense of academic morality
- ★ good communication and writing skills



How to apply?

We accept applications in every October. Applicants are required to submit a personal statement specifying the following details: personal academic interests, scientific activities in which they have participated, future career plans, transcript, class ranking and personal thoughts on the specialized courses and academic activities. The recruitment committee will then conduct preliminary evaluations based on the statements submitted. Candidates who pass this round will be asked to give an oral defense and the recruitment committee will select the best qualified.





The Beutler Institute

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