Training Course for Stem Cell Technology

(Provisional Agenda)

DATE	LECTURE	LECTURE OUTLINE
10/11/2008, Saturday	Student Registration	
10/12/2008, Sunday		
8:30-9:30 am Cheng, Tao University of Pittsburgh, USA	Overview of stem cell research	• Properties of stem cells: self-renewal and differentiation • Types of stem cells: adult stem cells, ES cells and iPS cells • Mechanisms of stem cell self-renewal and Stemness • Cell-cycle control in stem cells
9:30-10:30 am Xu, Renhe University of Connecticut, USA	Culture and Differentiation of Human ES Cells	1. Overview of hESC research 2. hESC culture: • MEF preparation (with live MEF preferred) • Thawing hESCs • Splitting hESCs • Selecting and maintaining hESCs (with live hESCs preferred) • Freezing hESCs 3. Cell surface markers of hESC and mESC 4. Extrinsic factors for hESC self-renewal and long-term culture 5. Animal-free conditions for hESC culture
10:30-11:30 am Xu, Renhe Chen, Guibin	Demonstration of hES cell culture	
11:30-1:00 pm	**Lunch break**	discussion between faculties and students
1:00-2:00 pm Xiao, Lei Shanghai Institute of Biochemistry and Cell biology, Shanghai	Long-term preservation and quality control of stem cells	How to do characterization and quality control of human ES cell
2:00-3:00 pm Wang, Zack Maine Medical Center, USA	Cardiovascular differentiation of ES cells	• Maintenance and differentiation of mES cells • Cardiomyocyte differentiation from mES cells • Endothelial and smooth muscle differentiation from hES cells
3:00-4:00 pm Lu, Shijiang Advanced Cell Technology, USA	Hematopoietic differentiation of human ES cells	• Hematopoietic system and HSC • hematopoietic differentiation of hESCs with stromal cell co-culture • hematopoietic differentiation of hESCs by EB formation with serum • hematopoietic differentiation of hESCs by EB formation without serum • hematopoietic differentiation of hESCs through Hemangioblasts • erythroid differentiation

		• megakaryocyte differentiation---platelets
4:00-5:30 pm Lu, Shijiang Chen, Guibin	Demonstration of hES cell culture	
10/13/2008, Monday		
8:30-9:30 am Shen, Qin Albany Medical School, USA	neural stem cell assays	• Locations of neural stem cells • Isolation and cultures of neural stem cells: adherent or non-adherent cultures • Self-renewal and differentiation assays
9:30-10:30 am Zhao, Chunhua Institute of Basic Medical Sciences, CAMC, Beijing	How to get stem cell products into clinical trails in China	
10:30-11:30 am StemCell Technologies	Presentation Demonstration	
11:30-1:00 pm	**Lunch break**	
1:00-2:20 pm Cheng, Tao University of Pittsburgh, USA	Hematopoietic stem cell assays	• CFU, • CAFC, • HSC single cell clonogenic assay, • CRU
2:30-3:50 pm Zhou, Daohong Medical University of South Carolina, USA	Assays for stem cell aging and damages	• ROS production, • DNA damage, • apoptosis, • senescence
4:00-5:20 pm Hang, Zhongchao Institute of Hematology, CAMC, Tianjin	Isolation and differentiation of mesenchymal stem cells	
10/14/2008, Tuesday		
8:30-9:50 am Feng, Lixin Shanghai Jiaotong University, Shanghai	Culture and Manipulations of Germ Line Stem Cells	• Isolation and characterization of spermatogonial stem cells. • Culture and pluripotency study of spermatogonial stem cells.
10:00-11:20 am Yu, Junying University of Wisconsin, USA	iPS cells	
11:30-1:00 pm	**Lunch break**	discussion between faculties and students
1:00-2:20 pm Yang, Yongguang Harvard University, USA	Animal models for stem cell research	• Selection of mouse strains for human and mouse hematopoietic stem cell transplantation • Conditioning protocols for HSC transplantation • Assessment of HSC engraftment and

		differentiation
2:20-3:40 pm Li, Shaoguang The Jackson Laboratory, USA	Phenotype and In vivo models of leukemia stem cells	• Model human blood cancers in mice • Survival mechanisms of leukemic stem cells • Application of mouse leukemia models in translational research
3:40-4:30 pm Wu, Wen-shu Maine Medical Center, USA	Isolation and analysis of stem cells by FACS	• Basic Flow Cytometry Theory • Analysis of HSCs and other stem cells (cell cycle, proliferation, apoptosis) • Stem cell sorting
4:30-5:30 pm BD Biosciences	Flow cytometry demonstration	
10/15/2008,Wednesday		
8:30-9:50 am Qu, Cheng-Kui Case Western Reserve University, USA	Derivation of mouse ES cells from blastocyst and chimeric mouse analysis	• Derivation of mouse ES cells from blastocyst • Gene targeting strategies • Introduction of transgenes into ES cells • Isolation of individual ES cell colonies and genotyping • Types of chimeras • Production of chimeric mice
10:00-11:20 Gao, Shaorong NIBS, Beijing	Nuclear reprogramming and epigenetics	• fundamental mouse embryology techniques • somatic cell nuclear transfer • epigenetic reprogramming
11:30-1:00 pm	**Lunch break**	
1:00-2:20 pm Cheng, Linzhao Johns Hopkins University, USA	Genetic manipulation of stem cells	
2:30-3:50 pm Li, Linheng Stowers Institute for Medical Research, USA	Identification of stem cell niche	• The concept of stem cell niche • Historic review of stem cell niche discovery • Stem cell niche in multiple species and tissues • Hematopoietic stem cell niches • Multiple cellular components of the stem cell microenvironment and zone concept
Relocation to stem cell conference and Buffet Dinner	**Socialization**	discussion between faculties and students