

BIOGRAPHICAL SKETCH

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NAME Linzhao Cheng, Ph.D.	POSITION TITLE Associate Professor		
eRA COMMONS USER NAME LCHENG2	Stem Cell Program, Institute for Cell Engineering Johns Hopkins University School of Medicine		
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
Univ. of Science and Technology of China, Hefei, Anhui Province, P.R. China	B. Sc.	1980-1985	Molecular Biology
Johns Hopkins University School of Medicine Baltimore, MD	Ph.D.	1985-1991	Molecular Biology and Genetics
NCI-Frederick Cancer Research & Development Center, Frederick, MD	Postdoctoral Fellow	1991-1994	Stem Cell and Developmental Biology

A. Positions and Honors:**Positions**

4/1986 - 1/1991	Ph.D. research with Dr. Thomas J. Kelly, Department of Molecular Biology and Genetics, Johns Hopkins University School of Medicine, Baltimore, Maryland
2/1991 - 9/1994	Postdoctoral research with Dr. Peter J. Donovan, Mammalian Genetics Laboratory, ABL-Basic Research Program, NCI-Frederick Cancer Research & Development Center, Frederick, Maryland
9/1994 - 12/1996	Research Scientist II and Group Leader, Stem Cell Biology/Gene Delivery Group, SyStemix, Inc., Palo Alto, California
1/1997 - 1/1999	Senior Research Scientist, and Manager for Molecular Stem Cell Biology and Stromal Biology Groups, Gryphon/Osiris Therapeutics, Inc, Baltimore, Maryland
2/1999 – 9/2005	Assistant Professor of Oncology, Johns Hopkins University School of Medicine
10/1999 – 11/2003	Co-Director, Viral Vector Core Facilities at Johns Hopkins Cancer Center
Since 11/2003	Member, Stem Cell Program in the Johns Hopkins Institute for Cell Engineering
12/2003 – 9/2005	Assistant Professor, Division of Developmental Genetics, Department of Gyn/Ob, Johns Hopkins University School of Medicine
7/2005 – 9/2005	Assistant Professor, Division of Hematology in Department of Medicine
Since 10/2005	Associate Professor of Gyn/Ob, Medicine and Oncology Johns Hopkins University School of Medicine

Honors

1985	The World Bank/China overseas graduate fellowship
1991-1994	ABL postdoctoral fellowship at NCI-Frederick Cancer Res. & Dev. Center
2000-2001	The (inaugural) Stewart Trust Scholar at Johns Hopkins Oncology Center
2003	USA Presidential Early Career Award For Scientists and Engineers (PECASE)

Academic services:

2001-2002, Member (*ad hoc*), NIH RIRG-C Grant Review Committee; 7/2003, Member, NIH/NIGMS Special Emphasis Panel for reviewing *National Stem Cell Research Center (P20)* grants; 4/2003, Member, NIH/NHLBI HLBP Workgroup 015 (for PPG review); 5/2004, Member, NIH/CSR Special Emphasis Panel, ZRG1 BDA-F (50); 2/2005, Member (*ad hoc*), NIH/CSR Hematopoiesis (HP) study section; 5/2005, Member, NIH/NCRR Review panel for *National Stem Cell Bank* contract; 6/2005, Member (*ad hoc*), NIH/CSR Development-2 (Dev-2) study section; Grant/award reviews for Cancer

Research UK, Swiss Nation Science Foundation, the National Natural Sciences Foundation of China; and Canadian Foundation of Innovation.

B. Selected publications: (*Selected from ~50 total publications, in chronological order*).

1. Cheng L, and Kelly TJ (1989). Transcriptional activator Nuclear Factor I stimulates the replication of SV40 minichromosomes *in vivo* and *in vitro*. **Cell**, 59:51-551.
2. Cheng L, Workman, JL, Kingston RE, and Kelly TJ (1991). Regulation of DNA replication *in vitro* by the transcriptional activation domain of GAL4-VP16. **Proc. Natl. Acad. Sci. (USA)**, 89:589-593.
3. Resnick JL, Bixler L, Cheng L, and Donovan PJ (1992). Long-term proliferation of mouse primordial germ cells in culture. **Nature**, 359: 550-551.
4. Cheng L, Gearing, DP, White LS, Compton D, Schooley K, and Donovan PJ (1994). Role of leukemia inhibitory factor receptor (LIFR) for the growth of mouse primordial germ cells. **Development**, 120: 3145.
5. Cheng L, Fu J, Tsukamoto A, and Hawley RG (1996). Use of green fluorescent protein (GFP) variants to monitor gene transfer and expression in mammalian cells. **Nature Biotechnology**, 14:606-609.
6. Cheng L, Du C, Murray D, Tong X, Zhang YA, Chen BP, and Hawley RG (1997). A GFP reporter system to assess gene transfer and expression in viable human hematopoietic progenitor cells. **Gene Therapy**, 4:1013.
7. Donovan PJ, de Miguel M, Cheng L, Resnick JL (1998). Primordial germ cells, stem cells and testicular cancer. **APMIS**. 106(1):134. (review)
8. Cheng L, Du C, Lavau C, Chen S, Tong J, Chen BP, Scollay R, and Hawley RG, and Hill B (1998). Sustained gene expression in retrovirally-transduced, engrafting human hematopoietic stem cells and their lympho-myeloid progeny. **Blood**, 92:83.
9. Cheng L*, Qasba P*, Vanguri P and Thiede MA (2000). Human mesenchymal stem cells support megakaryocyte and pro-platelet formation from CD34⁺ hematopoietic progenitor cells. **J. Cellular Physiology**, 184: 58-69. (* Shared first authorship)
10. Liu X, Rapp N, Deans R, and Cheng L (2000). Molecular cloning of a candidate cytokine gene selectively expressed in human CD34+ cells. **Genomics**, 65:283-292.
11. Yang XM, Liu H, Li D, Zhou X, Jung WC, Deans AE, Cui Y, Cheng L (2001). Digital optical imaging of green fluorescent protein for tracking vascular gene expression. **Radiology**, 219: 171-175.
12. Shablott MJ, Axelman J, Littleman JW, Blumenthal PA, Huggins GR, Cui Y, Cheng L, and Gearhart JD (2001). Human embryonic germ cell derivatives express a broad range of developmentally distinct markers and proliferate extensively in vitro. **PNAS**, 98, 113.
13. Gao Z, Golob J, Tanavde V, Civin CI, Hawley RG and Cheng L (2001). High levels of transgene expression following long-term NOD/SCID repopulating human cells with a modified lentiviral vector. **Stem Cells**, 19: 247-259.
14. Yang X, Atalar E, Li D, Serfaty J, Kumar A, Cheng L (2001). Magnetic resonance imaging (MRI) permits in vivo monitoring catheter-based vascular gene transfer. **Circulation**, 104: 1588-90.
15. Cui Y, Golob J, Kelleher E, Ye Z, Pardoll D, Cheng L (2002). Targeting transgene expression to antigen presenting cells derived from lentivirus transduced, engrafting human hematopoietic stem/progenitor cells. **Blood**, 99; 399-408.
16. De Miguel MP, Cheng L, Holland EC, Federspiel MJ, Donovan PJ (2002). Dissection of the c-Kit signaling pathway in mouse primordial germ cells by retroviral-mediated gene transfer. **PNAS**, 99(16):10458-63.
17. Whartenby KA, Straley EE, Kim H, Racke F, Gorski KS, Cheng L, Pardoll DM and Civin C (2002). Transduction of donor hematopoietic stem-progenitor cells with Fas ligand enhanced engraftment in allogeneic bone marrow transplant. **Blood**, 100: 3147-3154.
18. Cui Y, Kelleher E, Straley E, Fuchs E, Gorski K, Levitsky H, Borrello I, Civin C, Schoenberger S, Cheng L, Pardoll DM, Whartenby KA. (2003). Immunotherapy of established tumors using bone marrow transplantation with antigen gene-modified hematopoietic stem cells. **Nature Medicine**, 9: 952-958.
19. Cheng L, Hammond H, Ye Z, Zhan X, and Dravid G (2003). Human adult marrow cells support prolonged expansion of human embryonic stem cells in culture. **Stem Cells**, 21:131-142.
20. Angelopoulou M, Novelli E, Grove JE, Henry M, Rinder M, Civin C, Cheng L, Krause DS (2003). Co-transplantation Of Human Mesenchymal Stem Cells Enhances Human Myelopoiesis And Megakaryocytopoiesis In NOD/SCID Mice. **Experimental Hematology**, 31(5): 413-420.

21. Yu X, Zhan X, D'Costa J, Tanavde VM, Ye Z, Peng T, Malehorn MT, Yang X, Civin CI and Cheng L (2003). Lentiviral Vectors with Two Independent Internal Promoters Transfer High-Level Expression of Multiple Transgenes to Human Hematopoietic Stem-Progenitor Cells. **Molecular Therapy**, 7(6): 827-838.
22. McCauslin CS, Wine J, Cheng L, Klarmann KD, Candotti F, Clausen PA, Spence SE, Keller JR (2003). In vivo retroviral gene transfer by direct intrafemoral injection results in correction of the SCID phenotype in Jak3 knockout animals. **Blood**, 102: 843-848.
23. Zhou X, Cui Y, Huang X, Yu Z, Thomas AM, Ye, Z, Pardoll DM, Jaffee EM, and Cheng L (2003). Lentivirus-Mediated Gene Transfer and Expression in Established Human Cytotoxic T cells Specific to Tumor Antigen and Primary Unstimulated T Cells. **Human Gene Therapy**, 14:1089-1105.
24. Ye Z and Cheng, L (2003). Making lentiviral vectors more powerful and universal. **Discovery Medicine**, 3: 48-49 (review).
25. Pan F, Ye Z, Cheng L, Liu JO (2004). Myocyte enhancer factor 2 mediates calcium-dependent transcription of the interleukin-2 gene in T lymphocytes. **J Biol Chem**. 279: 14477-14480.
26. Dunlap S, Yu X, Cheng L, Civin CI, Alani RM (2004). High-Efficiency Stable Gene Transduction in Primary Human Melanocytes Using a Lentiviral Expression System. **J Invest. Dermatol**. 122: 549-551.
27. Zhan X, Dravid G, Ye Z, Hammond H, Shambloott M, Gearhart J, and Cheng L (2004). Functional antigen-presenting leukocytes derived from human embryonic stem cells: implications for improving transplant outcome. **Lancet**, 364: 163-171.
28. Chen HH, Zhan X, Kumar A, Du X, Wang D, Cheng L, Yang X (2004). Detection of Dual Gene Expression in Arteries Using an Optical Imaging Method. **J. Biomedical Optics** 9(6):1223-1229.
29. Du, X, Qiu B, Zhan X, Kolmakova A, Gao F, Hofmann LV, Cheng L, Chatterjee S, Yang XM (2005). Intravascular MR/Radiofrequency-Enhanced Vascular Gene Transduction/Expression: Feasibility Study in Pigs. **Radiology**, 236: 939-944.
30. Chou W-C, Chen H-Y, Yu S-L, Cheng L, Yang P-C, Dang CV (2005). Arsenic suppresses gene expression in promyelocytic leukemia cells partly through SP1 oxidation. **Blood**, 106(1):304-310.
31. Dravid G, Ye Z, Hammond H, Chen G, Pyle A, Donovan PJ, Yu X and Cheng L (2005). Defining the role of Wnt/beta-catenin signaling in the survival, proliferation and self-renewal of human embryonic stem cells. **Stem Cells**, 23: 1489-1488.
32. Wang K, Xue T, Tsang SY, Van Huizen R, Wong CW, Lai KW, Ye Z, Cheng L, Au KW, Zhang J, Li GR, Lau CP, Tse HF, Li RA (2005). Electrophysiological properties of pluripotent human and mouse embryonic stem cells. **Stem Cells**, 23: 1526-1534.
33. Dravid G, Hammond H and Cheng L (2005). Culture of human embryonic stem cells on human and mouse feeder cells. In *Human embryonic stem cells* (edited by K. Turksen), as a volume of "**Methods in Molecular Biology**" (series editor: JM Walker). Humana Press, Totowa, NJ, USA. In press.
34. Yu, X, Alder JK, Chun JH, Friedman AD, Heimfeld S, Cheng L, Civin CI (2006). HES1 inhibits cycling of hematopoietic progenitor cells via DNA-binding. **Stem Cells**, 24: 876-888.
35. Litvinov IV, Antony L, Dalrymple SL, Becker R, Cheng L, Isaacs JT (2006). C3, but not DU145, human prostate cancer cells retain the coregulators required for tumor suppressor ability of androgen receptor. **The Prostate**, July 11, online .

C. Research Support:

Active

R01 HL073781 (Linzhaio Cheng)	9/1/03-8/31/09*	50%
NIH/NHLBI		

Directing Human ES & EBD Cells to Blood & Immune Cells

The major goal of this project is to establish efficient culture systems to generate blood and immune cells from human embryonic stem (ES) and embryoid body-derived (EBD) cells.

Role: PI

(* Due to the PECASE award issued in 2004, this R01 grant is extended to the 6th year)

2-P01CA70970 Project 3 (Curt Civin/Donald Small)	04/1/02-03/31/07	5%
NCI/NIH		
<i>Hematopoietic Stem Cells for Transplantation</i>		

Principal Investigator/Program Director (Last, First, Middle):

Dr. L Cheng was a co-investigator for both Project 3 (PI: small) and Project 4 (PI: Civin) until March 2004. He remains to be an investigator for Project 3 entitled "FLT3: role and regulation in HSC". Major goals are: 1). Define the role of FLT3-mediated signal transduction in high and low quality HSC; 2) Determine the candidate gene expression profile dependent on FLT3 signaling in high and low quality HSC. 3). Identify enhancers and transcription factors which regulate the FLT3 gene in HSC.

Role: co-investigator

P50 CA103175 (Zaver Bhujwalla) 7/1/03-6/30/08 5%
NIH/NCI

In vivo Molecular and Cellular Imaging Center for Cancer Research

Dr. Cheng is a member of Molecular Biology/Genetics Core in this center grant.

Role: co-investigator

S2005-026 (Linzhaio Cheng) 4/1/05-3/31/07 0%
Stem Cell Research Foundation

Gene Traps in human embryonic stem cells using improved lenti-vectors

This pilot research project is to develop and use novel lenti-vectors for making insertional mutagenesis with a reporter gene targeted to an endogenous gene (gene trap).

Role: PI

Completed (as PI, in the past 3 years)

DAMD17-02-1-00 (L Cheng) 01/1/02-12/31/03

US Department of Defense/Prostate Cancer Program

Antigen specific immunotherapy using lentivirus transduced hematopoietic progenitor cells: a novel approach for the treatment of metastatic prostate cancer

Role: PI

Institutional Pilot Research Grant (L Cheng) 01/1/03-12/31/03

Johns Hopkins Institute for Cell Engineering

Lentiviral vectors for stem cell marking and differentiation research

This pilot research project is to develop novel lentiviral vectors with better regulatory elements and reporter genes.

Role: PI

6189-02 (L Cheng) 09/1/01-08/31/04

The Leukemia & Lymphoma Society

Antigen-Specific and Therapeutic Vaccination Using Gene-Transduced Hematopoietic Cells

To develop more potent cancer immunotherapies through transduction of dendritic cells or their dematopoietic precursors with genes encoding a full-length tumor rejection antigen by lentiviral vectors.

Role: PI