

Curriculum Vitae

Hui Zheng

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Education and Work:

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| 09, 2010 –Current | Principal Investigator, Guangzhou Institutes of Biomedicine and Health, Chinese Academy of Sciences, Guangzhou, Guangdong, People's Republic of China. |
| 02, 2010 –09,2010 | Postdoctoral Research Assistant, Pharmacology, University of Minnesota, Minneapolis, MN, USA |
| 09, 2005 – 01, 2010 | Graduate Student (Ph.D.), Pharmacology, University of Minnesota, Minneapolis, MN, USA |
| 09, 2001 – 07, 2005 | Undergraduate Student, Biology, Tsinghua University, Beijing, People's Republic of China. |

Research Experience

Principal Investigator

09, 2010 – Current

Research Focus: The mechanisms underlying cell fate conversions

Try to explore the common mechanisms underlying different cell fate changes, including de-differentiation/reprogramming (using MEFs to iPSCs as a model), differentiation (using ESCs/iPSCs to NSCs/neurons as models) and trans-differentiation (using MEFs to NSCs/hepatic cells as models). The study relates to the interactions among pluripotency-related transcription factors, epigenetic regulations, cell cycle and the transitions between mesenchymal and epithelial cells.

Postdoctoral Research Assistant

01, 2010 – 09, 2010

Research Focus: The influence of opioids on the central nervous system

In addition to finishing the study in Ph.D. period, the effects of opioids (morphine and fentanyl) on adult neurogenesis, conditioned place preference, learning and memory are under investigation. Especially, I am trying to explore the contribution of NeuroD activity to these processes.

Graduate Student

09, 2005 – 01, 2010

Research Focus: Agonist-Selective Signaling of GPCR

By using μ -opioid receptor as a model, my current research was to understand the mechanism and consequence of the agonist-selective signaling of G protein-coupled receptor. Specifically, I demonstrated that the differential influence of opioid agonists on the dendritic morphology is due to the agonist-selective control of miRNAs expression, which also related to the adult neurogenesis with the detailed mechanism under investigation. In addition, the sub-domain location of receptor on cell membrane and the PKC ϵ / β -arrestin pathways were identified as the determinant and mediators respectively for the agonist-selective signaling.

Undergraduate Student

09, 2001 – 07, 2005

Research Focus: Pluripotency of Embryonic Stem Cell

The primary focus was on the transcriptional regulation of Nanog which is essential for the maintenance of embryonic stem cell pluripotency. We identified the cis-elements in the Nanog promoter which contributes to the different transcription levels of Nanog in differentiated and undifferentiated cells. Moreover, the interaction between homeodomain containing protein, Msx2, and Nanog promoter was illustrated at the same time.

Publications

Accepted Manuscripts (* corresponding author)

23) He S, Sun H, Lin L, Zhang Y, Chen J, Liang L, Li Y, Zhang M, Yang X, Wang X, Wang F, Zhu F, Chen J, Pei D, & **Zheng H*** (2017) Passive DNA demethylation preferentially up-regulates pluripotency-related genes and facilitates the generation of induced pluripotent stem cells. *The Journal of biological chemistry* 2017 Sep 18. pii: jbc.M117.810457. doi: 10.1074/jbc.M117.810457. [Epub ahead of print]

22) He S, Chen J, Zhang Y, Zhang M, Yang X, Li Y, Sun H, Lin L, Fan K, Liang L, Feng C, Wang F, Zhang X, Guo Y, Pei D*, & **Zheng H*** (2017) Sequential EMT-MET induces neuronal conversion through Sox2. *Cell discovery* 3:17017.

21) Sun H, Liang L, Li Y, Feng C, Li L, Zhang Y, He S, Pei D, Guo Y*, **Zheng H*** Lysine-specific histone demethylase 1 inhibition promotes reprogramming by facilitating the expression of exogenous transcriptional factors and metabolic switch. (2016) *Sci Rep* 6:30903

20) Liang L#, Sun H#, Zhang W, Zhang M, Yang X, Kuang R, & **Zheng H*** Meta-Analysis of EMT Datasets Reveals Different Types of EMT. (2016) *PloS one* 11(6):e0156839.

19) Chen J#, Li W, Li Y, He S, Li L, Liang L, Song Y, Qin D, & **Zheng H*** MicroRNA-128-3p impaired water maze learning by suppressing Doublecortin expression in both wild type and Abeta-42 infused mice. *Neurosci Lett* (2016) 626:79-85.

18) Huang Z#, Liang L#, Li L#, Xu M, Li X, Sun H, He S, Lin L, Zhang Y, Song Y, Yang M, Luo Y, Loh HH, Law PY, Zheng D, & **Zheng H*** Opioid doses required for pain management in lung cancer patients with different cholesterol levels: negative correlation between opioid doses and cholesterol levels. *Lipids in health and disease* (2016) 15:47.

17) He S, Guo Y, Zhang Y, Li Y, Feng C, Li X, Lin L, Guo L, Wang H, Liu C, Zheng Y, Luo C, Liu Q, Wang F, Sun H, Liang L, Li L, Su H, Chen J, Pei D*, & **Zheng H*** Reprogramming somatic cells to cells with neuronal characteristics by

defined medium both in vitro and in vivo. *Cell Regen (Lond)* (2015) 4:12

16) **Zheng H**, Hutchins AP, Pan G, Li Y, Pei D*, & Pei G* Where cell fate conversions meet Chinese philosophy. *Cell Res* (2014) 24(10):1162-3.

15) Li W, He S, Zhou Y, Li Y, Hao J, Zhou X, Wang F, Zhang Y, Huang Z, Li Z, Loh HH, Law PY, & **Zheng H*** NeuroD1 Modulates Opioid Antinociceptive Tolerance via Two Distinct Mechanisms. *Biol Psychiatry* (2014) 76(10):775-84.

14) Li X, Pei D, & **Zheng H*** Transitions between epithelial and mesenchymal states during cell fate conversions. *Protein Cell* (2014) 5(8):580-91.

13) Liu X, Sun H, Qi J, Wang L, He S, Liu J, Feng C, Chen C, Li W, Guo Y, Qin D, Pan G, Chen J, Pei D*, & **Zheng H*** Sequential introduction of reprogramming factors reveals a time-sensitive requirement for individual factors and a sequential EMT-MET mechanism for optimal reprogramming. *Nat Cell Biol* (2013) 15(7):829-838.

12) **Zheng H***, Zhang Y, Li W, Loh HH, & Law PY NeuroD Modulates Opioid Agonist-Selective Regulation of Adult Neurogenesis and Contextual Memory Extinction. *Neuropsychopharmacology* (2013) 38(5):770-777.

11) **Zheng H***, Loh HH, & Law PY Posttranslation modification of G protein-coupled receptor in relationship to biased agonism. *Methods Enzymol* (2013) 522:391-408.

10) **Zheng H***, Zou H, Liu X, Chu J, Zhou Y, Loh HH, & Law PY Cholesterol level influences opioid signaling in cell models and analgesia in mice and humans. *J Lipid Res* (2012) 53(6):1153-1162.

09) **Zheng H***, Pearsall EA, Hurst DP, Zhang Y, Chu J, Zhou Y, Reggio PH, Loh HH, & Law PY Palmitoylation and membrane cholesterol stabilize mu-opioid receptor homodimerization and G protein coupling. *BMC Cell Biol* (2012) 13:6.

08) **Zheng H***, Law PY, & Loh HH Non-Coding RNAs Regulating Morphine Function: With Emphasis on the In vivo and In vitro Functions of miR-190. *Front Genet* (2012) 3:113.

07) **Zheng H***, Chu J, Zhang Y, Loh HH, & Law PY Modulating micro-opioid receptor phosphorylation switches agonist-dependent signaling as reflected in

PKCepsilon activation and dendritic spine stability. *J Biol Chem* (2011) 286(14):12724-12733.

06) **Zheng H***, Zeng Y, Zhang X, Chu J, Loh HH, & Law PY mu-Opioid Receptor Agonists Differentially Regulate the Expression of miR-190 and NeuroD. *Mol Pharmacol* (2010) 77(1):102-109.

05) **Zheng H***, Zeng Y, Chu J, Kam AY, Loh HH, & Law PY Modulations of NeuroD activity contribute to the differential effects of morphine and fentanyl on dendritic spine stability. *J Neurosci* (2010) 30(24):8102-8110.

04) **Zheng H***, Loh HH, & Law PY Agonist-selective signaling of G protein-coupled receptor: Mechanisms and implications. *IUBMB Life* (2010) 62(2):112-119.

03) **Zheng H***, Chu J, Zeng Y, Loh HH, & Law PY Yin Yang 1 phosphorylation contributes to the differential effects of mu-opioid receptor agonists on microRNA-190 expression. *J Biol Chem* (2010) 285(29):21994-22002.

02) **Zheng H***, Loh HH, & Law PY beta-Arrestin-Dependent mu-Opioid Receptor-Activated Extracellular Signal-Regulated Kinases (ERKs) Translocate to Nucleus in Contrast to G Protein-Dependent ERK Activation. *Mol Pharmacol* (2008) 73(1):178-190.

01) **Zheng H***, Chu J, Qiu Y, Loh HH, & Law PY Agonist-selective signaling is determined by the receptor location within the membrane domains. *Proc Natl Acad Sci U S A* (2008) 105(27):9421-9426.

Other Publication

10) Zhang Y, Xu C, **Zheng H**, Loh HH, & Law PY (2016) Morphine Modulates Adult Neurogenesis and Contextual Memory by Impeding the Maturation of Neural Progenitors. *PloS one* 11(4):e0153628.

09) Zhang W, Chang J, Lin L, Minn K, Wu B, Chien J, Yong J, **Zheng H**, Kuang R Network-based Isoform Quantification with RNA-Seq Data for Cancer Transcriptome Analysis. *PLOS Comp Biol* Accepted.

08) Xu C, **Zheng H**, Loh HH, & Law PY. Morphine Promotes

Astrocyte-Preferential Differentiation of Mouse Hippocampal Progenitor Cells Via PKCepsilon-Dependent ERK Activation and TRBP Phosphorylation. *Stem Cells*. 2015, 33(9):2762-2772.

07) Zhou L, Shen Y, Jiang L, Yin D, Guo J, **Zheng H**, Sun H, Wu R*, & Guo Y*. Systems mapping for hematopoietic progenitor cell heterogeneity. *PLoS One*. 2015, 10(5):e0126937.

06) Zhou YY, Hou GQ, He SW, Xiao Z, Xu HJ, Qiu YT, Jiang S, **Zheng H**, & Li ZY*. Psora-4, a Kv1.3 Blocker, Enhances Differentiation and Maturation in Neural Progenitor Cells. *CNS Neurosci Ther*. 2015, 21(7):558-567.

05) Xu C*, Zhang Y, **Zheng H**, Loh HH, & Law PY Morphine modulates mouse hippocampal progenitor cell lineages by up-regulating miR-181a level. *Stem Cells* (2014) 32(11):2961-72.

04) Wu Q*, Hwang CK, **Zheng H**, Wagley Y, Lin HY, Kim do K, Law PY, Loh HH, & Wei LN MicroRNA 339 down-regulates mu-opioid receptor at the post-transcriptional level in response to opioid treatment. *FASEB J* (2013) 27(2):522-535.

03) Chu J*, **Zheng H**, Zhang Y, Loh HH, & Law PY Agonist-dependent mu-opioid receptor signaling can lead to heterologous desensitization. *Cell Signal* (2010) 22(4):684-696.

02) Chu J*, **Zheng H**, Loh HH, & Law PY Morphine-induced mu-opioid receptor rapid desensitization is independent of receptor phosphorylation and beta-arrestins. *Cell Signal* (2008) 20(9):1616-1624.

01) Pan G, Li J, Zhou Y, **Zheng H**, & Pei D* A negative feedback loop of transcription factors that controls stem cell pluripotency and self-renewal. *FASEB J* (2006) 20(10):1730-1732.

Positions in Academic Organizations of Journals

1. IUBMB Life
Editorial Board Member
Since 2013
2. Cell Regeneration
Editorial Board Member
Since 2011
3. Society of Neuroscience
Member
Since 2009
4. RGC Hong Kong
External Reviewer
Since 2014

Grants

Key Project of Chinese Academy of Sciences

N/A	2016.10~2020.09	~2.50 Million
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National Natural Science Foundation of China (key project)

91519305	2016.01~2016.12	~0.90 Million
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National Natural Science Foundation of China (excellent young scientist)

31422032	2015.01~2017.12	~1.00Million
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National Natural Science Foundation of China (innovation group)

31421004	2015.01~2020.12	~2.40Million
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Guangdong Natural Science Foundation

S2012010010087	2012.10~2014.09	~0.05 Million
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Guangzhou International Science and Technology Cooperation Projects

2012J5100007	2012.05-2015.05	~0.30 Million
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Strategic Priority Research Program of the Chinese Academy of Sciences

XDA01020303,	2011.01-2015.12	~8.00Million
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National Natural Science Foundation of China (young scientist))

31100773	2012.01-2015.12	~0.26 Million
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Major New Drugs Innovation” of Major National Scientific and Technological Project

2011ZX09102-010-01	2011.01-2013.12	~1.00 Million
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Conference Presentations (oral):

2010. 10 Beijing Forest University, Beijing, China
Oral Presentation in ASBMB. Title: “Opioid, NeuroD, Adult Neurogenesis and Memory”, **Hui Zheng**, Ji Chu, Horace H. Loh and Ping-Yee Law”
2010. 09 Cold Spring Harbor Asia Conference, Suzhou, China
Oral Presentation Titled “NeuroD, Adult Neurogenesis and Memory” in “Reprogramming and Plasticity” section, “Molecular Switches & Genome Function in Stem Cells & Development”, **Hui Zheng**, Ji Chu, Horace H. Loh and Ping-Yee Law”
2010. 04 Experimental Biology 2010, Anaheim, CA
Poster Presentation in ASBMB. Title: “Yin Yang 1 Phosphorylation contributes to the differential effects of μ -opioid receptor agonists on miR-190 expression”, **Hui Zheng**, Ji Chu, Yan Zeng, Horace H. Loh and Ping-Yee Law”
2009. 10 Society of neuroscience annual meeting in Chicago, IL.
Poster Presentation Title: μ -opioid receptor modulates the stability of dendritic spines by agonist-selective regulation on NeuroD activity.
Hui Zheng, Yan Zeng, Xiaoxiao Zhang, Ji Chu, Horace H. Loh and Ping-Yee Law
2009. 05 2nd Annual Biomedical Sciences Graduate Programs, Minneapolis, MN
Oral Presentation. Title: “Agonist-selective signaling of MOR” **Hui Zheng**, Horace H. Loh and Ping-Yee Law
- 2008.08 236th American Chemical Society National Meeting, Philadelphia, PA
Oral Presentation in a symposium: “Pharmacology: The Forgotten Art

of Drug Discovery”. Title: “Agonist-Selective Signaling On mu-Opioid Receptor, **Hui Zheng**, Horace H. Loh and Ping-Yee Law”

2008.05 1st Annual Biomedical Sciences Graduate Programs, Minneapolis, MN
Poster Presentation. Title: “Agonist-selective signaling of MOR agonists, morphine and fentanyl, **Hui Zheng**, Horace H. Loh and Ping-Yee Law

2008.04 Experimental Biology 2008, San Diego, CA
Poster Presentation in Program: “G Protein II”, ASPET. Title: “Morphine and Etorphine activate same G protein but exhibit distinct pathways in μ -opioid receptor-mediated ERK1/2 activation, **Hui Zheng**, Horace H. Loh and Ping-Yee Law”

Honors and Awards

2014.08 Excellent Young Scientists of National Natural Science Foundation of China

2009.05 Beatrice Z. Milne and Theodore Brandenburg Awards for the excellent scientific achievement during the Ph.D. Study.

2008.04 Travel award from ASPET for Experimental Biology 2008

2004.09 Second Class Scholarship for academic excellence in Tsinghua University

2002.10 Second Class Scholarship for academic excellence in Tsinghua University