

Jinsong Li, Ph.D.

Academician, Chinese Academy of Sciences (since 2021)

Fellow, The World Academy of Sciences (TWAS) (since 2023)

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EDUCATION

1999----2002 Ph.D., Institute of Zoology, Chinese Academy of Sciences, Beijing, China.
1993----1996 M. Sc., Department of Animal Science, Yangzhou University, Jiangsu, China
1989----1993 B.S., Jiangxi Agriculture University, Jiangxi, China

PROFESSIONAL APPOINTMENT

2025----present Scientific Director, Shanghai Institute of Biochemistry and Cell Biology, CAS, Shanghai, China
2007----present Professor, Shanghai Institute of Biochemistry and Cell Biology, CAS, Shanghai, China
2002----2007 Postdoctoral Fellow, The Rockefeller University, New York, NY, USA
1997----1999 Lecturer, Yangzhou University, Jiangsu, China
1996----1997 Teaching assistant, Yangzhou University, Jiangsu, China

RESEARCH INTEREST

Identification of critical factors involved in PGC development and revealing underlying mechanisms.
Generation of disease models that mimic complex syndromes and understanding the pathological mechanisms.
Tagging every protein in mice (genome tagging project, GTP) and study of protein atlas during early embryonic development.
Study of underlying mechanisms of stemness and differentiation of spermatogonial stem cells.

RESEARCH EXPERIENCE

2017----present Complex genetic modifications in mouse with SC technology (Shanghai)

Using sperm-like stem cell-mediated SC technology, our research focus on investigating the roles of genome in development, diseases, and evolution through production of mouse models with complex genome edits. Our previous studies have demonstrated that SC technology ensures one-step generation of mouse models mimicking human complex diseases (*Cell Res*, 2020, 30, 133), medium-scale targeted screening of critical factors or amino acids in mouse development processes (*Nat Cell Biol*, 2018, 20, 1315; *Plos Biol*, 2019, 17, e3000350), and creation of mouse models with 19 pairs of chromosomes (*Cell Res*, 2022, 32, 1026). Most recently, we launched a major project to tag every protein in mice at genome-scale (Genome Tagging Project, GTP) based on sperm-like stem cell-mediated SC technology (*Nat Sci Rev*, 2019, 6, 394). Our future research will focus on promoting the application of SC technology and GTP libraries.

2012----2016 Establishment of sperm-like stem cell-mediated semi-cloning technology (Shanghai)

In 2012, we generated the first mouse androgenetic haploid embryonic stem cells (AG-haESCs, also termed

sperm-like stem cells) that can support full-term embryonic development upon injection into oocytes, leading to the generation of semi-cloned (SC) mice (SC technology) (*Cell*, 2012, 149, 605). However, one major drawback of this technology is the very low birth rate of healthy SC mice (2% of total SC embryos). In 2015, we optimized SC technology by generation of AG-haESCs carrying H19-DMR and IG-DMR deletions (DKO-AG-haESCs) that can efficiently support the generation of SC pups at a rate of 20% (*Cell Stem Cell*, 2015, 17, 221).

My lab demonstrated for the first time that CRISPR-Cas9 technology can efficiently repair genetic defect after injection into zygotes (*Cell Stem Cell*, 2013, 13, 659).

2007----2011 Somatic reprogramming and embryonic development (Shanghai)

My laboratory was interested in epigenetic reprogramming induced by nuclear transfer (NT) or Yamanaka method. We have improved the quality of iPSCs by comparing the difference between NT and iPSC technologies (*Cell Stem Cell*, 2011, 8, 371; *J Mol Cell Biol*, 2011, 3, 197; *Cell Res*, 2013, 23, 92) and revealed the mechanisms underlying the somatic reprogramming (*Nature*, 2011, 477, 606).

2002.08----2007.07 Mouse cloning (New York)

I generated cloned mice from olfactory neurons (*Nature*, 2004, 428, 393), skin cells (*PNAS*, 2007, 104, 2738) and frozen cells (*Biol Reprod*, 2008, 79, 588).

1999.09----2002.07 Bovine cloning (Beijing)

I produced the first cloned bovines in China when I was a Ph.D. candidate in Institute of Zoology in Beijing (*Chin Sci Bull*, 2003, 48, 549).

AWARDS and HONORS

2017, Shanghai National Natural Science Award (First class & first contributor)

2016, Guanghua Engineering Science and Technology Prize (Youth Prize)

2016, Asian-Pacific Molecular Biology Network (A-IMBN) Research Young Investigators/Ken-ichi Arai Award

2015, Outstanding Achievement Award from Chinese Society for Cell Biology

2014, Ho Leung Ho Lee Foundation award for Scientific and Technological Progress in life Science (Youth Innovation Prize)

2014, Tan Jiazhen Foundation Award for Life Science

2013, Shanghai Outstanding Young Scientists Award

2013, Promega Innovation Award from Chinese Society for Cell Biology

2012, Top ten scientific advances in China (first contributor)

2012, A-IMBN Research Young Investigators/Ken-ichi Arai Award

2012, National Outstanding Young Scientists from China NSF

2007, USDA-CSREES National Research Initiative Merit Awards (2007 annual meeting of Society for Study of Reproduction, San Antonio, Texas, USA)

2005, Chinese National Natural Science Award (Second class & Fourth contributor)

PROFESSIONAL ACTIVITIES

Journal editorial board member

Journal of Biological Chemistry, Editorial Board member since 2014

Open Biology, Editorial board member since 2016

Biology of Reproduction, Editorial board member since 2017

Science China Life Science, Editor since 2018

Journal of Molecular Cell Biology, Associate Editor since 2018

Asian Journal of Andrology, Editor-in-Chief since 2019

Journal of Genetics and Genomics, Associate Editor since 2020

National Science Open, Associate editor since 2021

Zoological Research, Editor board member since 2023

National Science Review, Section editor since 2023

Scientific organizations

ISSCR, 2017 annual meeting program committee member

ISSCR Asian Engagement Task Force, Committee member, 2019

State Key Laboratory of Cell Biology, Director, 2017-present

Shanghai Society for Cell Biology, Director, 2021-present

Chinese Society for Cell Biology, Vice Director – General, 2019-present

The International Commission on the Clinical Use of Human Germline Genome Editing, Committee Member, 2019-2020

SELECTED PUBLICATION (#Co-first authors; *Correspondence authors)

1. Zhang XM, Yan M, Yang Z, Xiang H, Tang W, Cai X, Wu Q, Liu X, Pei G & **Li J***. Creation of artificial karyotypes in mice reveals robustness of genome organization. *Cell Res* 32(11)(2022): 1026–1029.
2. Zhang H[#], Li Y[#], Ma Y[#], Lai C, Yu Q, Shi G, **Li J***. Epigenetic integrity of paternal imprints enhances the developmental potential of androgenetic haploid embryonic stem cells. *Protein & Cell* 13(2)(2021), 102-119.
3. Zhang XM[#], Wu K[#], Zheng Y[#], Zhao H[#], Gao J, Hou Z, Zhang M, Liao J, Zhang J, Gao Y, Li Y, Li L, Tang F*, Chen ZJ* & **Li J***. In vitro expansion of human sperm through nuclear transfer. *Cell Research* 30(4)(2020), 356-359.
4. Zhang XM[#], Wu K[#], Zheng Y[#], Zhao H[#], Gao J, Hou Z, Zhang M, Liao J, Zhang J, Gao Y, Li Y, Li L, Tang F*, Chen ZJ* & **Li J***. In vitro expansion of human sperm through nuclear transfer. *Cell Research* 30(4)(2020), 356-359.
5. Yin Q[#], Wang H[#], Li N[#], Ding Y[#], Xie Z[#], Jin, L[#], Li Y, Wang Q, Liu X, Xu L, Li Q, Ma Y, Cheng Y, Wang K, Zhong C, Yu Q, Tang W, Chen W, Yang W, Zhang F, Ding C, Bao L, Zhou B, Hu P* & **Li J***. Dosage effect of multiple genes accounts for multisystem disorder of myotonic dystrophy type 1. *Cell Research* 30(2)(2020), 133-145.
6. Bai M[#], Han Y[#], Wu Y, Liao J, Li L, Wang L, Li Q, Xing w, Chen L, Zou W* & **Li J***. Targeted genetic screening in mice through haploid embryonic stem cells identifies critical genes in bone development. *PLOS Biology* 17(7)(2019), e3000350.
7. Jiang J, Yan M, Li D & **Li J***. Genome tagging project: tag every protein in mouse through “artificial spermatids”. *Nat Sci Rev* 6(3)(2019), 394-396.
8. Li Q, Li Y, Yang S, Huang S, Yan M, Ding Y, Tang W, Lou X, Yin Q, Sun Z, Lu L, Shi H, Wang H, Chen Y* & **Li J***. CRISPR-Cas9-mediated base-editing screening in mice identifies DND1 amino acids that are critical for primordial germ cell development. *Nat Cell Biol* 20(11)(2018), 1315-1325.
9. Zhong C[#], Xie Z[#], Yin Q[#], Dong R, Yang S, Wu Y & **Li J***. Parthenogenetic haploid embryonic stem cells efficiently support mouse generation by oocyte injection. *Cell Res* 26(1)(2016), 131-134.
10. Zhong C[#], Zhang M[#], Yin Q, Zhao H, Wang Y, Huang S, Tao W, Wu K*, Chen Z-J* & **Li J***. Generation of human haploid embryonic stem cells from parthenogenetic embryos obtained by microsurgical removal of male pronucleus. *Cell Res* 26(6)(2016), 743-746.
11. Zhong C[#], Yin Q[#], Xie Z[#], Bai M[#], Dong R[#], Tang W, Xing Y, Zhang H, Yang S, Chen L-L, Bartolomei MS, Ferguson-Smith A, Li D, Yang L*, Wu Y* & **Li J***. CRISPR-Cas9-mediated genetic screening in mice with haploid embryonic stem cells carrying a guide RNA library. *Cell Stem Cell* 17(2)(2015), 221-232.

12. Wu Y[#], Zhou H[#], Fan X[#], Zhang Y[#], Zhang M[#], Wang Y, Xie Z, Bai M, Yin Q, Liang D, Tang W, Liao J, Zhou C, Liu W, Zhu P, Guo H, Pan H, Wu C, Shi H, Wu L*, Tang F* & Li J*. Correction of a genetic disease by CRISPR-Cas9-mediated gene editing in mouse spermatogonial stem cells. *Cell Res* 25(1)(2015), 67-79.
13. Guo F[#], Li X[#], Liang D[#], Li T[#], Zhu P, Guo H, Wu X, Wen L, Gu T, Hu B, Walsh CP, Li J*, Tang F* & Xu G*. Active and passive demethylation of male and female pronuclear DNA in the mammalian zygote. *Cell Stem Cell* 15(4)(2014), 447-458.
14. Wu Y[#], Liang D[#], Wang Y, Bai M, Tang W, Bao S, Yan Z, Li D & Li J*. Correction of a genetic disease in mouse via use of CRISPR-Cas9. *Cell Stem Cell* 13(6)(2013), 659-662.
15. Jiang J[#], Lv W[#], Ye X, Wang L, Zhang M, Yang H, Okuka M, Zhou C, Zhang X, Liu L* & Li J*. Zscan4 promotes genomic stability during reprogramming and dramatically improves the quality of iPS cells as demonstrated by tetraploid complementation. *Cell Res* 23(1)(2013), 92-106.
16. Yang H[#], Liu Z[#], Ma Y[#], Zhong C, Yin Q, Zhou C, Shi L, Cai Y, Zhao H, Wang H, Tang F, Wang Y, Zhang C, Liu X, Lai D, Jin Y*, Sun Q* & Li J*. Generation of haploid embryonic stem cells from Macaca fascicularis monkey parthenotes. *Cell Res* 23(10)(2013), 1187-1200.
17. Yang H[#], Shi L[#], Wang B[#], Liang D, Zhong C, Liu W, Nie Y, Liu J, Zhao J, Gao X, Li D, Xu G-L* & Li J*. Generation of genetically modified mice by oocyte injection of androgenetic haploid embryonic stem cells. *Cell* 149(3)(2012), 605-617.
18. Jiang J[#], Ding G[#], Lin J[#], Zhang M, Shi L, Lv W, Yang H, Xiao H, Pei G, Li Y, Wu J* & Li J*. Different developmental potential of pluripotent stem cells generated by different reprogramming strategies. *J Mol Cell Biol* 3(3)(2011), 197-199.
19. Gu T[#], Guo F[#], Yang H[#], Wu HP, Xu GF, Liu W, Xie ZG, Shi L, He X, Jin SG, Iqbal K, Shi YG, Deng Z, Szabo PE, Pfeifer GP, Li J* & Xu GL*. The role of Tet3 DNA dioxygenase in epigenetic reprogramming by oocytes. *Nature* 477(7366)(2011), 606-610.
20. Lin J, Shi L, Zhang M, Yang H, Qin Y, Zhang J, Gong D, Zhang X, Li D & Li J*. Defects in trophoblast cell lineage account for the impaired in vivo development of cloned embryos generated by somatic nuclear transfer. *Cell Stem Cell* 8(4)(2011), 371-375.