

BIOGRAPHICAL SKETCH

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NAME Chen, Xin	POSITION TITLE Associate Professor		
eRA COMMONS USER NAME (credential, e.g., agency login) XIN.CHEN			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
University of Science & Technology, Hefei, China	B.S.	9/91 - 6/96	Molecular Biology
University of Texas at Austin, TX	Ph.D	9/96 - 12/01	Mol. Cell & Dev. Biology
Stanford University School of Medicine	Postdoc	4/02 - 12/07	Developmental Biology

A. Personal Statement**B. Positions and Honors****Positions and Employment**

- 1998 – 1999 Teaching Assistant, Department of Zoology, Univ. of Texas at Austin
 1996 – 2001 Research Assistant, Molecular Cell and Developmental Biology, Univ. of Texas at Austin
 Advisor: Dr. Janice A. Fischer
 2002–2007 Postdoctoral fellow, Dept. of Developmental Biology, Stanford University School of Medicine
 Advisor: Dr. Margaret T. Fuller.
 2008-2014 Assistant Professor, Biology Department, The Johns Hopkins University
 2015- Associate Professor, Biology Department, The Johns Hopkins University

Other Experience and Professional Memberships

- 2001- American Society of Genetics
 2012 NIH DEV1 study section, *ad hoc* reviewer
 2013 NIH Special Emphasis Panel/Scientific Review Group (Transgenerational Effects from Environmental Exposures) Study Section, member
 2014 Faculty of 1000 member

Honors

- 1991 The Fourth Zhang Zhong-Zhi Technology Scholarship in honor of First Place in the National-wide College Entrance Examination in Anhui province, USTC, China
 1992 Excellent Student Fellowship, USTC, China
 1993 Guang Hua Educational Fund Fellowship, USTC, China
 1995 The Eighth Zhang Zhong-Zhi Technology Scholarship, USTC, China
 1996 – 1998 Molecular Biology Institute Fellowship for Predoctoral Studies, UT, Austin
 1998 Travel Funds from Department of Zoology, UT, Austin
 2000 Travel Funds from Center for Developmental Biology, UT, Austin
 2001 Dorothea Bennett Memorial Graduate Fellowship, UT, Austin
 2001 Professional Development Award from the Office of Graduate Studies, UT, Austin
 2002 Outstanding Dissertation award from Graduate School, University of Texas, Austin. One of the four awardees for academic years 2001 –2002, UT, Austin
 2003 Katherine McCormick Travel Fund, Stanford, CA
 2005 NIH NRSA Postdoctoral Fellowship, NICHD (declined)
 2005 – 2006 The Leukemia and Lymphoma Society Special Fellow, Stanford, CA
 2006 – 2010 The NIH Pathway to Independence (PI) Award (K99/R00)

- 2008- 2011 Edward Mallinckrodt, Jr. Foundation Young Investigator Award, the 49th Mallinckrodt Scholar
2009- 2011 Basil O'Connor Starter Scholar Research Award, March of Dimes
2009- 2014 David and Lucile Packard Fellowship for Science and Engineering
2011- 2012 Dean's Award for Excellence in Scholarship, Zanvyl Krieger School of Arts and Sciences,
Johns Hopkins University
2015 Inaugural Catalyst Award, Zanvyl Krieger School of Arts and Sciences,
Johns Hopkins University
2016 Finalist of the President's Frontier Award, Johns Hopkins University
2016 Howard Hughes Medical Institute, Bill & Melinda Gates Foundation, and the Simons Foundation
Faculty Scholar
2016 Finalist for the 2016 Blavatnik National Awards for Young Scientists
2017 Finalist of the President's Frontier Award, Johns Hopkins University
2017 Johns Hopkins Discovery Award with Drs. Jie Xiao and Taekjip Ha

C. Peer-reviewed Publications (in chronological order)

1. **Chen, X.**, Overstreet, E., Wood, S. A. and Fischer, J. A. (2000) On the conservation of function of the *Drosophila* Fat facets deubiquitinating enzyme and Fam, its mouse homolog. Dev. Genes Evol. 210: 603- 610.
2. **Chen, X.***, Li, Q.* and Fischer, J. A. (2000) Genetic analysis of the *Drosophila* DNAprim gene: The function of the 60-kD primase subunit of DNA polymerase opposes the fat facets signaling pathway in the developing eye. Genetics 156: 1787-1795. (* equal contribution)
3. **Chen, X.** and Fischer, J. A. (2000) In vivo structure/function analysis of the *Drosophila* fat facets deubiquitinating enzyme gene. Genetics 156: 1829-1836.
4. **Chen, X.** and Fischer, J. A. (2002) A P element transformation vector for high levels of gene expression in germline cells of the ovary and undifferentiated cells in the developing eye of *Drosophila*. Plasmid 47: 61-65.
5. **Chen, X.**, Zhang, B. and Fischer, J. A. (2002) A specific protein substrate for deubiquitinating enzyme: Liquid facets is the substrate of Fat facets. Genes and Development 16: 289-294.
One of the cover stories.
6. Overstreet, E., **Chen, X.**, Wendlend, B., and Fischer, J. A. (2003) Either part of a *Drosophila* Epsin protein, divided after the ENTH domain, functions in endocytosis of Delta in the developing eye. Current Biology 13: 854-860.
7. Hiller, M., **Chen, X.**, Pringle, M.J., Suchorolski, M., Sancak, Y., Viswanathan, S., Bolival, B., Marino, S. and Fuller, M.T. (2004) Testis-specific TAF homologs collaborate to control a tissue-specific transcription program. Development, 131: 5297-5308.
8. **Chen, X.**, Hiller, M., Sancak, Y. and Fuller, M. T. (2005) Tissue specific TAFs counteract Polycomb to turn on terminal differentiation. Science 310: 869- 872.
Comment in BioEssays 28:330-334 (2006), by Ringrose, L. Featured in Faculty of 1000 Biology.
9. Krishnamoorthy, T., **Chen, X.**, Govin, J., Cheung, W.L., Dorsey, J., Schindler, K., Winter, E., Allis, C. D., Khochbin, S., Fuller, M. T., and Berger, S. L. (2006) Phosphorylation of histone H4 Ser1 regulates sporulation in yeast and is conserved in fly and mouse spermatogenesis. Genes and Development, 20: 2580–2592.
PMCID: PMC1578680.
One of the cover stories. Comment in Genes and Development 20: 2487–2491(2006), by Wendt K.D. and Shilatifard A.
10. **Chen, X.** (2008) Stem cells- what can we learn from flies? Invited review for Fly. FLY 2-1: 19- 28.

11. Gan, Q*, Chepelev, I*, Wei, G, Tarayrah, L, Cui, K, Zhao, K and **Chen, X.** (2010) Dynamic regulation of alternative splicing and chromatin structure in *Drosophila* gonads revealed by RNA-seq. Cell Research 20(7): 763-783 (2010). PMID: PMC2919574. (* equal contribution)
12. Gan, Q, Schones, DE, Eun, S, Wei, G, Cui, K, Zhao, K and **Chen, X.** (2010) Monovalent and unpoised status of most genes in undifferentiated cell-enriched *Drosophila* testis. Genome Biology 11(4):R42 (2010). PMID: PMC2884545.
13. Kracklauer, M.P., Wiora, H.M., Deery, W.J., **Chen, X.**, Bolival, B., Romanowicz, D., Simonette, R.A., Fuller, M.T., Fischer, J.A. and Beckingham, K.M. (2010) The *Drosophila* SUN protein Spag4 cooperates with the coiled-coil protein Turi Gagarin to maintain association of the basal body and spermatid nucleus. Journal of Cell Science 123 (16): 2763- 2772. PMID: PMC2915878.
14. Eun, S*, Gan, Q* and **Chen, X.** (2010) Epigenetic regulation of germ cell differentiation. Current Opinion in Cell Biology 22, 737-743. PMID: PMC2993805. (* equal contribution)
15. **Chen, X.***, Lu, C., Morillo, J., Eun, S. and Fuller, M.T.* (2011) Sequential changes at differentiation gene promoters as they become active in a stem cell lineage. Development 138: 2441-2450 (*co-corresponding authors.) PMID: PMC3100706.
16. Tran, V., Gan, Q. and **Chen, X.** (2012) Chromatin immunoprecipitation (ChIP) using *Drosophila* tissue. Journal of Visualized Experiments (JoVE), NIHMS429932, PMID: 22473446.
17. Cuddapah, S.*, Roh, T-Y., Cui, K., Fuller, M.T., Zhao, K. and **Chen, X.*** (2012) A novel human polycomb binding site acts as a functional polycomb response element in *Drosophila*, PLoS One 7(5):e36365, PMID: PMC3343078. (* co-corresponding authors)
18. Lim, C.*, Tarayrah, L.* and **Chen, X.** (2012) Transcriptional regulation during *Drosophila* spermatogenesis. Invited review to Spermatogenesis 2(3):158-166, PMID: PMC3469439 (* equal contribution).
19. Tran, V.*, Lim, C.*, Xie, J. and **Chen, X.** (2012) Asymmetric division of *Drosophila* male germline stem cell shows asymmetric histone distribution. Science, 338(6107): 679-682, PMID: PMC3532436 (* equal contribution). Featured in Faculty of 1000 Biology.
20. Morillo Prado, J. R., **Chen, X.** and Fuller, M.T. (2012) Polycomb group genes *Psc* and *Su(z)2* maintain somatic stem cell identity and activity in *Drosophila*. PLoS One, 7(12):e52892, PMID: PMC3528704.
21. Eun, S., Stoiber, P.M., Wright, H. J., McMurdie, K.E., Choi, C.H., Gan, Q., Lim, C., **Chen, X.** (2013) MicroRNAs downregulate Bag of marbles to ensure proper terminal differentiation in *Drosophila* male germline lineage. Development, 140, 23-30, PMID: PMC3513990.
22. Tarayrah, L., Herz, H-M., Shilatifard, A. and **Chen, X.** (2013) Histone demethylase dUTX directly antagonizes JAK-STAT signaling to maintain the *Drosophila* testis niche architecture. Development, 140, 1014-1023, PMID: PMC3583039.
23. Chepelev, I. and **Chen, X.** (2013) Alternative splicing switching in stem cell lineages. Invited review to Frontiers in Biology, 8(1):50-59. PMID: PMC3566875.
24. Barckmann, B., **Chen, X.**, Jayaramaiah-Raja, S., Kaiser, S., Rathke, C., Fuller, M.T., Renkawitz-Pohl, R. (2013) Three levels of regulation lead to protamine and Mst77F expression in *Drosophila*. Developmental Biology, 377:33-45. PMID: PMC4154633.

25. Tran, V.* , Feng, L.J.* and **Chen, X.** (2013) Asymmetric distribution of histones during *Drosophila* male germline stem cell asymmetric divisions. Invited review to Chromosome Research, 21:255-269. PMID: PMC4008969. (* equal contribution)
26. Chen, H-Y., **Chen, X.** and Zheng, Y-X. (2013) The nuclear lamina regulates germline stem cell niche organization via modulation of EGFR signaling. Cell Stem Cell, 13 (1):73–86, PMID: PMC3703100.
27. Tarayrah, L.* and **Chen, X.*** (2013) Epigenetic regulation in adult stem cells and cancers. Invited review to Cell and Bioscience, 3:41. PMID: PMC3852361. (* equal contribution)
28. Eun, S., Shi, Z., Cui, K., Zhao, K. and **Chen, X.** (2014) A non-cell autonomous role of E(z) to prevent germ cells from turning on a somatic cell marker. Science, 343(6178):1513-1516, PMID: PMC4040133. Featured in Faculty of 1000 Biology.
29. Feng, L.J. and **Chen, X.** (2015) Epigenetic Regulation of Germ Cells— Remember or Forget? Invited review to Current Opinion in Genes and Development, 31:20-27. PMID: PMC4470759.
30. Lim, C., Gandhi, S., Biniossek, M., Feng, L., Schilling, O., Urban, S. and **Chen, X.** (2015) An aminopeptidase acts in the *Drosophila* testicular niche for germline stem cell maintenance and spermatogonial dedifferentiation, Cell Reports, 13(2):315-325. PMID: PMC4607668.
31. Xie, J., Wooten, M., Tran, V., Chen, B-C., Pozmanter, C., Simbolon, C., Betzig, E. and **Chen, X.** (2015) Histone H3 Threonine phosphorylation regulates asymmetric histone inheritance in the *Drosophila* male germline, Cell, 163(4): 920–933. PMID: PMC4636931. Featured in Faculty of 1000 Biology. Previewed by Pirrotta, V. (2015) Histone Marks Direct Chromosome Segregation, Cell, 163(4): 792–793. Highlighted by Strzyz, P. (2015) Stem cells: Histone mark of stemness. Nat Rev Mol Cell Biol., 16(12):703.
32. Tarayrah, L.*[#], Li, Y. *, Eun, S., Shi, Z., Gan, Q. and **Chen, X.[#]** (2015) Histone demethylase Lid maintains germline stem cells through regulating JAK-STAT signaling pathway activity, Biology Open, 4(11):1518-1527 (* equal contribution; [#] co-corresponding authors). PMID: PMC4728359.
33. Feng, L., Shi, Z. and **Chen, X.** (2017) Enhancer of Polycomb coordinates multiple signaling pathways to promote both cyst and germline stem cell differentiation in *Drosophila* adult testis, PLoS Genetics 13:e1006571. PMID: PMC5308785.
34. Xie, J.*, Wooten, M.*, Tran, V. and **Chen, X.** (2017) Breaking symmetry—asymmetry histone inheritance in stem cells, invited review to Trends in Cell Biology, 27:527-540, PMID: PMC5476491 (* equal contribution).
35. Eun, S.*, Feng, L. *, Cedeno-Rosario, L., Gan, Q., Wei, G., Cui, K., Zhao, K., and **Chen, X.** (2017) Polycomb group gene E(z) is required for spermatogonial dedifferentiation in *Drosophila* adult testis, Journal of Molecular Biology, 429:2030-2041, PMID: PMC5516936 (* equal contribution).
36. Snedeker, J.*[#], Wooten, M.*[#] and **Chen, X.[#]** (2017) The inherent asymmetry of DNA replication, Annual Review of Cell and Developmental Biology, 33:291-318, PMID: 28800257, PMID: in progress (* equal contribution; [#] co-corresponding authors).
37. Gleason, R.J.*, Anand, A.*, Kai T.[§] and **Chen, X.[§]** (2018) Protecting and diversifying the germline, invited review to Genetics FlyBook, in press. (* equal contribution; [§] co-corresponding authors).
38. Feng, L., Shi, Z. and **Chen, X.** (2018) Enhancer of Polycomb maintains germline activity and genome integrity in *Drosophila* testis, Cell Death & Differentiation, in press.

39. Kahney, E. *, Ranjan, R. *, Gleason, R.J. * and **Chen, X.** (2018) Symmetry from Asymmetry or Asymmetry from Symmetry? Cold Spring Harbor Symposium 82: Chromosome Segregation and Structure, in press. (* equal contribution)

40. Wooten, M., Nizami, Z. *, Yang, X-X*, Snedeker, J. *, Ranjan, R. *, Kim, J-M., Urban, E., Tran, V., Buss, J., Gall, J., Xiao, J. and **Chen, X.** Asymmetric histone incorporation during DNA replication in Drosophila male germline stem cells, under review at *Cell* (<https://www.mendeley.com/sneak-peek/cellpress/>), deposited into bioRxiv at: <https://www.biorxiv.org/content/early/2018/01/04/242768>. (* equal contribution).

D. Research Support

Ongoing Research Support

R01GM112008, Chen (PI), Xiao (co-PI) 9/16/14-7/31/18
NIH, NIGMS

Molecular and cellular mechanisms underlying asymmetric histone inheritance

The major goals of this project are to investigate how preexisting and newly synthesized histone H3 are differentially incorporated into two sets of sister chromatids in S-phase germline stem cells; and to determine the mechanisms by which sister chromatids with preexisting vs. newly synthesized H3 are asymmetrically segregated in mitotic germline stem cells.

Role: Principal Investigator

Faculty Scholar, Chen (PI) 11/01/16- 10/31/21

Howard Hughes Medical Institute, Bill & Melinda Gates Foundation, and the Simons Foundation

Investigate the mechanisms of asymmetric histone inheritance in Drosophila male germline stem cell

asymmetric division, as well as the generality of this phenomenon in other cell types and in other organisms

Role: Principal Investigator

R21HD084959, Chen (PI) 08/03/15-07/31/17, No cost extension from 08/01/17- 07/31/18
NIH, NICHD

Study the generality of asymmetric histone inheritance

The major goals of this project are to investigate the inheritance mode for all canonical histones, in other asymmetrically dividing cells in Drosophila, and in mouse embryonic stem cells that are induced to divide asymmetrically.

Role: Principal Investigator

Packard Fellow, Chen (PI) 10/15/09- 10/14/14, No cost extension from 10/15/14- 10/14/18

The David and Lucile Packard Foundation

Single-cell analyses of gene expression and chromatin structure in programming germline stem cells

The major goals of this project are to analyze both transcriptome and epigenome of male germ cell cysts at each single stage during spermatogenesis.

Role: Principal Investigator

Completed Research Support (during the last three years)

1R01HD065816-01A1, Chen (PI) 8/24/11 – 4/30/16

NIH, NICHD

Epigenetic Regulation of Germ Cell Differentiation from a Stem Cell Lineage

Role: Principal Investigator