Xuebing Wu, Ph.D.

455 Main Street
Whitehead Institute Room 627
Cambridge, MA 02142

Lab phone: (617) 258-5990
Cell phone: (617) 301-1637
Email: wuxbl@wi.mit.edu

Web:
http://www.mit.edu/~wuxbl

EMPLOYMENT

2014-present **Helen Hay Whitney Postdoctoral Fellow**
Whitehead Institute for Biomedical Research
Advisor: **David P. Bartel, Ph.D.**
Research: Widespread influence of RNA structures on mRNA processing and stability

EDUCATION

2009-2014 **Ph.D.** in Computational and Systems Biology
Massachusetts Institute of Technology (MIT)
Advisor: **Phillip A. Sharp, Ph.D.** (co-advisor: **Christopher B. Burge, Ph.D.**)
Thesis: Mechanism and function of pervasive noncoding transcription in mammalian genomes

2007-2009 **M.S.** in Control Science and Engineering (Area: Bioinformatics)
Department of Automation, Tsinghua University, China
Advisor: **Rui Jiang, Ph.D.**
Thesis: Disease gene and pathway identification using network alignment approaches

2003-2007 **B.S.** in Control Science and Engineering
Department of Automation, Tsinghua University, China
Advisor: **Shao Li, M.D**. (co-advisor: **Michael Q. Zhang, Ph.D.**)
Thesis: Network-based global inference of human disease genes

PUBLICATIONS

* co-first authors; # co-corresponding authors

1. Tycko J, Barrera LA, Huston N, Friedland AE, Wu X, Gootenberg JS, Abudayyeh OO, Myer VE, Wilson CJ, Hsu PD.
Pairwise library screen characterizes *Staphylococcus aureus* Cas9 specificity in human cells.
bioRxiv 269399; doi: https://doi.org/10.1101/269399
2. Jiang W*, Wei Y*, Long Y*, Owen A, Wang B, Wu X, Luo S, Dang Y, Ma DK.
A cold-warming genetic program promotes *C. elegans* organismic death.
eLife. 2018, 7:e35037
3. Liu XS, Wu H, Krzisch M, Wu X, Greaf J, Muffat J, Hnisz D, Li C, Yuan B, Xu C, Li Y, Vershkov D, Cacace A, Young RA, Jaenisch R.
Rescue of fragile X syndrome by DNA methylation editing of the *FMR1* gene.
Cell. 2018, 172:979–992
4. Chiu AC*, Suzuki HI*, Wu X, Mahat DB, Kriz AJ, Sharp PA.
U1 snRNP suppresses premature polyadenylation at transcriptional pause sites associated with stable nucleosomes.
Molecular Cell. 2018, 69:648–663

5. Wu X, Bartel DP.
   Widespread influence of 3′-end structures on mammalian mRNA processing and stability.
   Cell. 2017, 169:905–917

6. Wu X[#], Bartel DP[#].
   *k*pLogo: positional *k*-mer analysis reveals hidden specificity in biological sequences.
   Nucleic Acids Research. 2017, W1:gkx323

7. Liu XS*, Wu H*, Ji X, Stelzer Y, Wu X, Czauderna S, Shu J, Shivalila CS, Dadon D, Young RA, Jaenisch R.
   Editing DNA methylation in the mammalian genome.
   Cell. 2016, 167:233-247

8. Zhang X, Chen MH, Wu X, Kodani A, Fan J, Doan R, Ozawa M, Ma J, Yoshida N, Reiter J, Black DL, Kharchenko PV, Sharp PA, Walsh CA.
   Cell type-specific alternative splicing governs cell fate in the developing cerebral cortex.
   Cell. 2016, 166:1147-1162 (cover story)

9. Ran FA*, Cong L*, Yan WX*, Scott DA, Gootenberg JS, Kriz AJ, Zetsche B, Shalem O, Wu X, Makarova KS, Koonin EV, Sharp PA, Zhang F.
   In vivo genome editing using *Staphylococcus aureus* Cas9.
   Nature. 2015, 520:186-191

10. Wu X, Scott DA, Kriz AJ, Chiu AC, Hsu PD, Dadon DB, Cheng AW, Trevino AE, Konermann S, Chen S, Jaenisch R, Zhang F[#], Sharp PA[#].
    Genome-wide binding of CRISPR-Cas9 in mammalian cells.
    Nature Biotechnology. 2014, 32:670-676

11. Wu X, Kriz AJ, Sharp PA.
    Target specificity of the CRISPR-Cas9 system.
    Quantitative Biology. 2014, 2:59-70 (review & cover, peer reviewed)

12. Chen S*, Xue Y*, Wu X, Cong L, Bhutkar A, Bell E, Zhang F, Langer R, Sharp PA.
    Global microRNA depletion suppresses tumor angiogenesis.
    Genes & Development. 2014, 28:1054-1067

13. Wu X, Sharp PA.
    Divergent transcription: a driving force for new gene origination?
    Cell. 2013, 155:990-996 (perspective/theory, peer reviewed)

14. Almada AA*, Wu X*, Kriz AJ, Burge CB, Sharp PA.
    Promoter directionality is controlled by U1 snRNP and polyadenylation signals.
    Nature. 2013, 499:360-363

15. Cong L*, Ran FA*, Cox D, Lin S, Barretto R, Habib R, Hsu PD, Wu X, Jiang W, Marraffini LA, Zhang F.
    Multiplex genome engineering using CRISPR/Cas systems.
    Science. 2013, 339 (6121):819-823

16. Hsu PD*, Scott DA*, Weinstein JA, Ran FA, Konermann S, Agarwala V, Li Y, Fine EJ, Wu X, Shalem O, Cradick TJ, Marraffini LA, Bao G, Zhang F.
    DNA targeting specificity of the RNA-guided Cas9 nuclease.
    Nature Biotechnology. 2013, 31:827-832 (cover story)

17. Lyubimova A, Itzkovitz S, Junker JP, Fan ZP, Wu X, van Oudenaarden A.
    Single-molecule mRNA detection and counting in mammalian tissue.
    Nature Protocols. 2013, 8:1743–1758

18. Chen Y, Wu X, Jiang R.
    Integrating human omics data to prioritize candidate genes.
    BMC Medical Genomics. 2013, 6:57

19. Wu X, Li S.
Cancer gene prediction using a network approach.
Cancer Systems Biology (Edited by Wang E). CRC Press, 2010, Chapter 11:191-212 (book chapter)

20. Wu X, Liu Q, Jiang R.
Align human interactome with phenome to identify causative genes and networks underlying disease families.
Bioinformatics. 2009, 25:98-104

21. Tang W, Wu X, Jiang R, Li Y.
Epistatic module detection for case-control studies: A Bayesian model with a Gibbs sampling strategy.
PLOS Genetics. 2009, 5(5):e1000464

22. Jiang R, Tang W, Wu X, Fu W.
A random forest approach to the detection of epistatic interactions in case-control studies.
BMC Bioinformatics. 2009, 10(Suppl 1):S65

23. Zhang W, Zeng F, Wu X, Zhang X, Jiang R.
A comparative study of ensemble learning approaches in the classification of breast cancer metastasis.
International Joint Conference on Bioinformatics, Systems Biology and Intelligent Computing. 2009, 242-245

24. Jiang R, Zeng F, Zhang W, Wu X, Yu Z.
Accelerating genome-wide association studies using CUDA compatible graphics processing units.
International Joint Conference on Bioinformatics, Systems Biology and Intelligent Computing. 2009, 70-76

25. Wu X, Jiang R, Zhang MQ, Li S.
Network-based global inference of human disease genes.
Molecular Systems Biology. 2008, 4:189

HONORS AND AWARDS

2017	**Margaret and Herman Sokol Postdoctoral Award**, Whitehead Institute
2017	**Oral Presenter Award**, RNA Symposium, University at Albany, SUNY
2016-2019	**Helen Hay Whitney Postdoctoral Fellowship**, Helen Hay Whitney Foundation
2014	**Honorable Mention**, The Regeneron Prize for Creative Innovation in a Graduate Student, Regeneron Pharmaceuticals, Inc.
2014	**AAAS/Science Program for Excellence in Science**, AAAS/Science - Recommended by Dean for the School of Science at MIT
2011-2014	**International Student Research Fellowship**, Howard Hughes Medical Institute
2011	**Integrative Cancer Biology Program (ICBP) Graduate Student Fellowship**, NCI/MIT
2009	**Rising Stars of Research**, Tsinghua University, China
2008	**Top–grade Scholarship** (the highest honor), Tsinghua University, China
2008	**Outstanding Graduate Student**, Tsinghua University, China
2007	**Graduate with Great Honor**, Tsinghua University, China
2006	**National Scholarship**, Ministry of Education of China

PRESENTATIONS

2017 Oct	**Invited talk**, Frontier Symposium on Deciphering the Genome, Harvard Medical School
2017 Aug	**Talk**, Cold Spring Harbor meeting on Eukaryotic mRNA Processing
2017 Jun	Poster, Gordon Research Conference on Nucleic Acids
2017 Apr	**Invited inaugural speaker**, Postdoc Work In Progress Seminar (WIPS), MIT
2017 Mar	**Talk**, RNA Symposium, University at Albany, SUNY
2017 Feb	**Talk**, Whitehead Forum

2015 May **Invited panelist**, Genome Engineering 3.0 Workshop, Broad Institute
2014 Jun **Invited talk**, Phillip Sharp 70th Birthday Symposium, MIT
2014 Apr **Invited talk**, Computational and Systems Biology Student Seminar, MIT
2014 Mar **Talk**, Cold Spring Harbor meeting on Systems Biology: Global Regulation of Gene Expression
2014 Mar **Talk**, MIT Koch Institute Friday Focus Seminar Series
2013 Nov **Invited talk**, RNA Genomics Symposium, Harvard Medical School
2013 Oct **Talk**, MIT Koch Institute Retreat
2013 Oct **Talk**, MIT Computational and Systems Biology Retreat
2013 Aug Poster, Cold Spring Harbor meeting on Eukaryotic mRNA Processing
2013 May Poster, HHMI Science Meeting
2013 Jan **Invited talk**, Key Laboratory of Bioinformatics, Ministry of Education, China
2011 Jul Poster, MIT Integrative Cancer Biology Program (ICBP) Retreat
2008 Dec **Plenary talk**, Tsinghua Forum for Doctoral Candidates, Tsinghua University

TEACHING EXPERIENCE

2011 **Teaching assistant** (student rating 6.7/7), MIT
Evolutionary Biology (Lecturers: Robert Berwick, Ph.D. & David Bartel, Ph.D.)
2008 **Teaching assistant**, Tsinghua University, China
Probability & Statistics for Computational Biology (Lecturer: Michael Waterman, Ph.D.)
2007 **Teaching assistant**, Tsinghua University, China
Proteins: Structure, Function, and Evolution (Lecturer: Zhirong Sun, Ph.D.)

MENTORING EXPERIENCE

- Rotation graduate student (MIT Biology)

  Nima Jaberi-Lashkari (04/2017)
  Byron Lee (02/2017)
  Kendall Condon (02/2016)
  Charles Li (05/2015)
  Gina Mawla (05/2013)

- Undergraduate thesis or research training

Elizabeth Martin (06-09/2015)	MIT Computer Science & Molecular Biology
Andrea Kriz (2011-2014)	MIT Biology (now graduate student at Harvard BBS)
Wenhui Fu (2009)	Tsinghua Electrical Engineering
Ming Yin (2009)	Tsinghua Software (now faculty at Purdue University)
Zheng Ke (2008)	Tsinghua Physics (now faculty at the University of Chicago)

OTHER PROFESSIONAL ACTIVITIES

- Invited ad hoc reviewer for

  PLOS Computational Biology
  Bioinformatics
  BMC Bioinformatics
  BMC Systems Biology
  Journal of Theoretical Biology
  Quantitative Biology
  OMICS
  Scientific Reports
  GigaScience
  PLoS ONE
  Molecular and Cellular Biochemistry
  RECOMB'15 (conference)
  APBC'17 (conference)

- Member, RNA Society (2011-2012)
- Member, International Society for Computational Biology (2009-2010)