GUANJING HU

Assistant Scientist, Department of Ecology, Evolution, and Organismal Biology
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EDUCATION

2006 - 2013 PhD in Genetics, Iowa State University, Ames, Iowa, USA

2002 - 2006 BS in Biology, Peking University, Beijing, China

RESEARCH EXPERIENCE

2018 - 2019 Assistant Scientist, Iowa State University

2013 - 2018 Postdoctoral Research Associate, Iowa State University
Advisor: Dr. Jonathan F. Wendel

2006 - 2013 Graduate Research Assistant, Iowa State University
"Evolutionary Proteomics of Cotton"
Advisor: Dr. Jonathan F. Wendel

2005 - 2006 Undergraduate Research Assistant, Laboratory of Protein Structure and Proteomics, Peking University
"Purification, Crystallization and Preliminary Crystallographic Analysis of SMU.636, a putative glucosamine 6-phosphate deaminase from *Streptococcus mutants*"
Advisor: Dr. Xiaodong Su

2004 - 2005 Undergraduate Research Assistant, Laboratory of Nitrogen Fixation, State Key Laboratory of Protein Engineering and Plant Genetic Engineering, Peking University
"Transcriptional control of a glutamine transporter (*glnH*) regulated by both nitrogen and carbon resources in *E. coli*"
Advisor: Dr. Yiping Wang

TEACHING AND LEADERSHIP EXPERIENCE

2008-2019 Undergraduate and Graduate Research Mentor, Iowa State University.
For each of the following mentees, I designed the research project, conducted training for safety and experimental techniques, and provided guidance through the research project: Dharminder Pathak (Visiting Scientist, 2008), Linnea Schmidt (Undergraduate Research Intern, 2009 summer), Hao Jiang (Graduate Rotation Student, 2015 Spring), Ching-Yi Liao (Graduate Rotation Student, 2017 Spring), Sandi Thu (Graduate Rotation Student, 2017 Winter), Yating Dong (Visiting Graduate Student, 2017-2019).

2017 Workshop facilitator, AGEP (Alliance for Graduate Education and the Professoriate) Diversity and Inclusion Workshop, Graduate College of Iowa State University.
This workshop series was funded by NSF, aiming to build an inclusive community of students, postdocs and faculty from all backgrounds. I co-facilitated the 4-hour postdoc workshop for Fall17/Spring18.

2011-2012 Teaching Assistant, Iowa State University.
I managed student inquiries and evaluated written assignments for Organismal Evolution (Biology 315) in Spring 2009.
I taught two sections of the 3-hour per week lab each semester for Principles of Biology Laboratory II (Biology 212L) in Fall 2010, and for Biology Laboratory (Biology 211L) in Fall 2011 and both the Spring and Fall semesters of 2012.

PUBLICATIONS

Co-first author(s) indicated with asterisks

Hu, G., C.E. Grover, D. Yuan, J. Jareczek, Y. Dong, E. Miller, J.L. Conover, J.F. Wendel. (in press) Evolution and diversity of the cotton genome, pp. ##-## in *Cotton Precision Breeding*, edited by M.M.U. Rahman, Y. Zafar and T.Z. Zhang. Springer Nature

*Bao, Y., ***G. Hu**, C.E. Grover; J.L. Conover, D. Yuan and J.F. Wendel. (in review) Unraveling *cis* and *trans* regulatory evolution during cotton domestication. *Nature Communications*

Dong, Y., **G. Hu**, J. Yu, S. Thu, C.E. Grover; S. Zhu, and J.F. Wendel. (in review) Salt tolerance in diploid and polyploid cotton *Gossypium* species. *The Plant Journal*

Chen, J.Z., A. Sreedasyam, A. Ando, Q. Song, L. De Santiago, A. Hulse-Kemp, M. Ding, R.C. Kirkbride, J. Jenkins, C. Plott, J. Lovell, Y.M. Lin, R.Vaughn, B. Liu, L. Wen, S. Simpson, B.E. Scheffler, C.A. Saski, C.E. Grover, **G. Hu**, J. Conover, J. Carlson, S. Shu, L.B. Boston, M. Williams, D.G. Peterson, K. McGee, D.C. Jones, J.F. Wendel, D.M. Stelly, J. Grimwood, and J. Schmutz. (in revision) Genomic insights into the origin, diversification and improvement of allotetraploid cottons. *Nature*

Grover, C.E., M. Yoo, M. Gore, D. Harker, R. Byers, A. Lipka, **G. Hu**, D. Yuan, J. Conover, J. Udall, A. Paterson, and J.F. Wendel. (in revision) Genetic analysis of the transition from wild to domesticated cotton (*G. hirsutum*). *G3: Genes, Genomes, Genetics*

Chen, X.Y., J.F. Cao, B. Zhao, C.-C. Huang, Z.-W. Chen, T. Zhao, H.R. Liu, **G. Hu**, X.X. Shangguan, C.M. Shan, L.J. Wang, T.Z. Zhang, J.F. Wendel, and X.Y. Guan. (in review) The miR319-targeted *GhTCP4* regulates the transition from cell elongation to secondary cell wall synthesis in cotton fiber. *The Plant Cell*

Girimurugan, S.B., X. Sui, **G. Hu**, Z.M. Turpin, H.W. Bass, J. Zhang. (in review) iSeg-Web: a web based implementation of iSeg, a genomic segmentation algorithm. *BMC Bioinformatics*

Hu, G. and J. F. Wendel. 2019. *Cis-trans* controls and regulatory novelty accompanying allopolyploidization. *New Phytologist* 221:1691–1700.

*Zhao, B., *J. F. Cao, ***G. Hu**, Z. W. Chen, L. Y. Wang, X. X. Shangguan, Ling-Jian Wang, Y. B. Mao, T. Z. Zhang, J. F. Wendel, X. Y. Chen. 2018. Core *cis*-element variation confers subgenome-biased expression of a transcription factor that functions in cotton fiber elongation. *New Phytologist* 218(3):1061-1075.

Wendel, J. F., D. Lisch, **G. Hu**, and A. S. Mason. 2018. The long and short of doubling down: polyploidy, epigenetics, and the temporal dynamics of genome fractionation. *Current Opinion in Genetics & Development* 49:1–7.

Grover, C. E., M. A. Arick II, J. L. Conover, A. Thrash, **G. Hu**, W. S. Sanders, C-Y. Hsu, R. Zahra Naqvi, M. Farooq, X. Li, L. Gong, J. Mudge, T. Ramaraj, J. A. Udall, D. G. Peterson, and J. F. Wendel. 2017. Comparative genomics of an unusual biogeographic disjunction in the cotton tribe (*Gossypieae*) yields insights into genome downsizing. *Genome Biology and Evolution* 9(12):3328–3344.

Hu, G., R. Hovav, C. Grover, A. Faigenboim-Doron, N. Kadmon, J. T. Page, J. Udall and J. F. Wendel. 2016. The evolutionary rewiring of oilseed expression networks in *Gossypium* (cotton). *Genome Biology and Evolution* 8 (12): 3765-3783.

Gallagher, J., C. Grover, **G. Hu**, and J. F. Wendel. 2016. Insights into the Ecology and Evolution of Polyploid Plants through Network Analysis. *Molecular Ecology* 25 (11): 2644-2660.

Hu, G., J. Koh, M. J. Yoo, S. Chen, and J. F. Wendel. 2015. Gene-expression novelty in allopolyploid cotton: A proteomic perspective. *Genetics* 200: 91-104.

Hovav, R., A. Faigenboim-Doron, N. Kadmon, **G. Hu**, X. Zhang, J. P. Gallagher, and J. F. Wendel. 2015. A transcriptome profile for developing seed of polyploid cotton. The *Plant Genome* 8 (1).

Hu, G., J. Koh, M. J. Yoo, D. Pathak, S. Chen, and J. F. Wendel. 2014. Proteomics profiling of fiber development and domestication in upland cotton (*Gossypium hirsutum* L.). *Planta* 240: 1237-1251.

Shan, C. M., X. X. Shangguan, B. Zhao, X. F. Zhang, L. M. Chao, C. Q. Yang, L. J. Wang, Hua-Yu Zhu, Yan-Da Zeng, Wang-Zhen Guo, Bao-Liang Zhou, **G. Hu**, X. Y. Guan, J. Z. Chen, J. F. Wendel, T. Z. Zhang, and X. Y. Chen. 2014. Control of cotton fibre elongation by a homeodomain transcription factor GhHOX3. *Nature Communications* 5: 5519.

Hu, G., J. Koh, M. Yoo, K. Grupp, S. Chen, and J. F. Wendel. 2013. Proteomic profiling of developing cotton fibers from wild and domesticated *Gossypium barbadense*. *New Phytologist* 200 (2).

Paterson, A. H., J. F. Wendel, H. Gundlach, H. Guo, J. Jenkins, D. Jin, D. Llewellyn, K. C. Showmaker, S. Shu, J. Udall, M. Yoo, R. Byers, W. Chen, A. Doron-Faigenboim, M. V. Duke, L. Gong, J. Grimwood, C. Grover, K. Grupp, **G. Hu**, T. Lee, J. Li, L. Lin, T. Liu, B. S. Marler, J. T. Page, A. W. Roberts, E. Romane, W. S. Sanders, E. Szadkowski, X. Tan, H. Tang, C. Xu, J. Wang, Z. Wang, D. Zhang, L. Zhang, H. Ashrafi, F. Bedon, J. E. Bowers, C.

L. Brubaker, P. W. Chee, S. Das, A. R. Gingle, C. H. Haigler, D. Harker, L. V. Hoffmann, R. Hovav, D. C. Jones, C. Lemke, S. Mansoor, M. Rahman, L. N. Rainville, A. Rambani, U. K. Reddy, J. Rong, Y. Saranga, B. E. Scheffler, J. A. Scheffler, D. M. Stelly, B. A. Triplett, A. V. Deynze, M. F. S. Vaslin, V. N. Waghmare, S. A. Walford, R. J. Wright, E. A. Zaki, T. Zhang, E. S. Dennis, K. F. X. Mayer, D. G. Peterson, D. S. Rokhsar, X. Wang & J. Schmutz. 2012. Repeated polyploidization of *Gossypium* genomes and the evolution of spinnable cotton fibres. *Nature* 492: 423-428.

Bao, Y., **G. Hu**, L. E. Flagel, A. Salmond, M. Bezanilla, A. H. Paterson, Z. Wang, and J. F. Wendel. 2011. Parallel up-regulation of the profilin gene family following independent domestication of diploid and allopolyploid cotton (*Gossypium*). *Proc. Natl. Acad. Sci. USA* 108: 21152–21157.

Hu, G., N. L. Houston, D. Pathak, L. Schmidt, J. Thelen and J. F. Wendel. 2011. Genomically biased accumulation of seed storage proteins in allopolyploid cotton. *Genetics* 189: 1103-1115.

Hu, G., J. Hawkins, C. Grover, J. F. Wendel. 2010. The history and disposition of transposable elements in polyploid *Gossypium*. *Genome* 53: 599-607.

Hovav, R., J. A. Udall, B. Chaudhary, E. Hovav, L. Flagel, **G. Hu**, and J. F. Wendel. 2008. The evolution of spinable cotton fiber entailed natural selection for prolonged development and a novel metabolism. *PLOS Genetics* 4(2): e25.

Hawkins, J. S., **G. Hu**, R. A. Rapp, J. L. Grafenberg, and J. F. Wendel. 2008. Phylogenetic determination of the pace of transposable element proliferation in plants: copia and LINE-like elements in *Gossypium*. *Genome* 51: 11-18.

Hu, G., L. Li, D. Li, C. Liu, S. Wei, Y. Liang and X. Su. 2007. Protein preparation and preliminary X-ray crystallorgraphic analysis of a putative glucosamine 6-phosphate deaminase from *Streptococcus mutants*. *Acta Crystallographica Section F* 63: 809-811.

ORAL PRESENTATIONS AT PROFESSIONAL CONFERENCES

2019 *Chromatin structure and evolution of duplicated gene expression*. International Conference on Polyploidy, Ghent, Belgium.

2018 *Dynamics of duplicated networks in polyploids*. Plant and Animal Genome Conference: section Polyploidy, San Diego, CA, USA.

2017 *Dynamics of duplicated networks in polyploids*. NYC Global Research Initiative Workshop - Plant Genome Evolution: From Genotype to Phenotype through Regulatory Networks, New York, NY, USA.

2014 *Promise and pitfalls of proteomics in polyploid plants*. Plant and Animal Genome Conference: section Polyploidy, San Diego, CA, USA.
Comparative proteomics of diploid and polyploid cotton. Plant and Animal Genome Conference: section Proteomics. San Diego, CA, USA.

2009 *Evolutionary proteomics of cottonseed*. Plant and Animal Genome Conference: section Cotton. San Diego, CA, USA.
Comparative evolutionary analysis of cottonseed proteome. Plant and Animal Genome Conference: section Proteomics. San Diego, CA, USA.

INVITED TALKS

2018 *Polyploidy and duplicated gene regulation, stories of cotton*.
(Feb 21) Online seminar 23rd, Chinese Genomics Meet-up online (http://cgmonline.co).

Dynamics of duplicated networks in polyploids.
(May 9) JinPing Hua Lab, Department of Plant Genetics and Breeding, College of Agronomy and Biotechnology, China Agricultural University, Beijing, China
(May 12) Nanhu International Youth Scientist Forum, Huazhong Agricultural University, Wuhan, Hunan, China.
(May 15) Institution of Genomics and Bioinformatics, South China Agricultural University, Guangzhou, Guangdong, China.
(May 17) Agricultural Genomics Institute at Shenzhen, Chinese Academy of Agricultural Sciences, Shenzhen, China.
(June 11) Youth Scientist Forum, State Key Laboratory of Systematic and Evolutionary Botany, Institute of Botany, Chinese Academy of Sciences, Xiangshan, Beijing, China.

Chromatin structure and polyploid evolution.
(Oct 9) Interdepartmental Genetics and Genomics (IG) program workshop "Epigenetics and Epi-transcriptomics: How do DNA and RNA modifications affect gene expression, development, and disease?" Iowa State University, Ames, IA, USA.

2014 *Comparative proteomics of diploid and polyploid cotton.* (May 21) Xiaoya Chen Lab, Institute of Plant Physiology and Ecology, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences, Shanghai, China

GRANTS AND AWARDS

2009-2013 Graduate Research Fellowship, Cotton Incorporated (No. 09-558), *Comparative evolutionary proteomics of cotton* ($109,000)

2012 Teaching Excellence Award, Iowa State University, Ames, Iowa, USA

2009 Graduate Student Research Awards, Department of Ecology, Evolution, and Organismal Biology, Iowa State University, Ames, Iowa, USA ($500)
Travel reimbursement, International Cotton Genome Initiative ($335)

2008 Professional Advancement Grant for Travel, Iowa State University, Ames, Iowa, USA ($300)

2004 Chun-Tsung Scholarship for Undergraduate Research Project, Peking University, Beijing, China ($300)

SERVICE

Graduate Student Representative, 2012 Plant Evolutionary Genomics faculty search committee, EEOB, Iowa State University

Membership in Professional Societies:

International Cotton Genome Initiative (ICGI), 2012-present

International Plant Proteomics Organization (INPPO), 2011-present

Editorial role:

Frontiers in Genetics, Review Editor in the editorial board of Plant Genomics (2019-present)

Reviewing activity for academic journals:

BMC Genomic (1)
BMC Plant Biology (1)
Frontiers in Plant Science (2)
Frontiers in Genetics (1)
G3: Genes Genomes Genetics (3)
Journal of Integrative Plant Biology (2)
Journal of Proteomics (2)
Heredity (1)
Molecular Biology and Evolution (1)
Methods (1)
Molecular Genetics and Genomics (1)
Plant Physiology (1)
PloS One (1)
The Plant Cell (1)
The Plant Journal (1)