

## **Jianxin Ma, Ph.D.**

Department of Agronomy, Center for Plant Biology, Purdue University  
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### **Education**

- Ph.D. Plant Genetics and Breeding, 1999, Chinese Academy of Agricultural Sciences (CAAS)  
M.S. Plant Genetics and Breeding, 1996, CAAS  
B.S. Crop Science, 1993, Laiyang (*current* Qingdao) Agricultural University

### **Academic Appointments**

- 2015- Professor, Department of Agronomy, Purdue University  
2011-2015 Associate Professor, Department of Agronomy, Purdue University  
2007-2011 Assistant Professor, Department of Agronomy, Purdue University  
2006-2007 Research Assistant Professor, Department of Agronomy, Purdue University  
2005-2006 Research Geneticist, Department of Agronomy, Purdue University  
2003-2005 Postdoctoral Associate, Department of Genetics, University of Georgia  
2000-2003 Postdoctoral Associate, Department of Biological Sciences, Purdue University  
1999-2000 Assistant Research Professor, CAAS

### **Awards and Honors**

- 2018 Fellow, American Association for the Advancement of Science  
2016 Agricultural Research Award, College of Agriculture, Purdue University  
2012 University Faculty Scholar (2012-2017), Purdue University  
2012 Seeds for Success Award, Purdue University (2009, 2012)  
2001 National One Hundred Excellent Doctoral Dissertation, Ministry of Education, China  
1999 Doctoral Graduate with Most Distinction

### **Membership in Academic, Professional and Scholarly Societies**

American Association for the Advancement of Science  
American Society of Plant Biologists  
American Society of Agronomy  
American Soybean Association  
Crop Science Society of America  
Sigma Xi Honorary Society

### **Professional Services**

#### Editorial Boards of Scientific Journals:

Editor	<i>Plant Journal</i>	2019-Present
Associate Editor	<i>Molecular Breeding</i>	2018-Present
Associate Editor	<i>Plant Genome</i>	2018-Present
Associate Editor	<i>Journal of Integrative Agriculture</i>	2017-Present
Associate Editor	<i>G3: Genes, Genomes, Genetics</i>	2014-Present
Associate Editor-in-Chief	<i>Oil Crop Science</i>	2014-Present
Associate Editor	<i>Crop Journal</i>	2013-Present
Associate Editor	<i>Soybean Science</i>	2010-Present

### Ad-hoc Manuscript Reviewers:

Invitations from ~70 peer-reviewed high-impact journals/publishers including *Nature Genetics*, *Nature Communications*, *Nature Plants*, *PNAS*, *Genome Research*, *Plant Cell*, *Genome Biology*, *Molecular Biology and Evolution*, *PLoS Genetics*, *Plant Physiology*, *Plant Journal*, *Molecular Plant*, *New Phytologist*, *Nucleic Acids Research*, MPMI, TAG etc.

### Research Grant Panelists:

Served as Panelists for: U.S. National Science Foundation (NSF)-DBI; NSF-IOB; USDA-NIFA; U.S. DOT-Sun Grant Initiative (SGI); National Natural Science Foundation of China (NSFC)

### Ad-hoc Research Grant Reviewers:

Served as research grant reviewers for: NSF-DBI, NSF-IOB, USDA-NIFA, USDA-ARS, DOT-SGI, U.S. Civilian R&D Foundation; Binational Agricultural R&D Fund US-Israel (BARD); NSFC, Qatar Foundation etc.

## **Grants**

Summary: Supported by >30 extramural grants from NSF-PGRP, USDA-NIFA, United Soybean Board, North Central Soybean Research Program, Indiana Soybean Alliance, Dow AgroSciences, and Ag. Alumni Seeds etc. and seven internal university/college grants. The total funding awarded to Dr. Ma and co-workers is ~\$8 millions, of which Dr. Ma is directly responsible for ~\$6 millions for research in the Ma laboratory.

## **Recent Publications** (out of a total of 80+, ~10,900 citations, *h*-index 38, and *i10*-index 62)

1. Li, S., Ding, Y., Zhang, D., Wang, X., Tang, X., Dai, D., Jin, H., Lee, S.H., Cai, C. and **Ma\***, **J. 2018**. Parallel domestication with a broad mutational spectrum of determinate stem growth habit in leguminous crops. *Plant Journal* doi: 10.1111/tpj.14066.
2. Zeng, A., Chen, P.\*, Korth, K.L., Ping, J., Thomas, J., Wu, C., Srivastava, S., Pereira, A., Hancock, F., Brye, K., and **Ma, J. 2018**. RNA sequencing analysis of salt tolerance in soybean (*Glycine max*). *Genomics*. doi: 10.1016/j.ygeno.2018.03.020.
3. Zhang, D.#, Sun, L.#, Li, S.#, Wang, W., Swarm, S.A., Li, L., Ding, Y. Wang, X., Tang, X., Zhang, Z., Tian, Z., Cai, C., Brown, P.J., Nelson, R.L., and **Ma\*, J. 2018**. Elevation of soybean seed oil content through selection for seed coat shininess. *Nature Plants*, 4: 30-35.
4. Zhao, M., Zhang, B., Lisch, D.\*, and **Ma, J.\* 2017**. Patterns and Consequences of Subgenome Differentiation Provide Insights into the Nature of Paleopolyploidy in Plants. *Plant Cell*, 29: 2974-2994.
5. Zhang, D.#, Zhao, M.#, Li, S., Sun, L., Wang, W., Cai, C., Dierking, E.C. and **Ma, J.\* 2017**. Plasticity and innovation of regulatory mechanisms underlying seed oil content mediated by duplicated genes in the palaeopolyploid soybean. *Plant Journal*, 90, pp.1120-1133.
6. Gao, J., Yang, S.\*, Cheng, W., Fu, Y., Leng, J., Yuan, X., Jiang, N., **Ma, J.\*** and Feng, X.\*, **2017**. GmILPA1, Encoding an anaphase-promoting complex-like protein, affects leaf petiole angle. *Plant Physiology*, 174: 1167-1176.
7. Li, L.#, Lin, F.#, Wang, W., Ping, J., Fitzgerald, J.C., Zhao, M., Li, S., Sun, L., Cai, C., and **Ma, J.\* 2016**. Fine mapping and candidate gene analysis of two loci conferring resistance to *Phytophthora sojae* in soybean. *Theor. Appl. Genet.* 129: 2379-2386.
8. Liu, Y.#, Zhang, D.#, Ping, J., Li, S., Chen, Z., and **Ma, J.\* 2016**. Innovation of a regulatory

mechanism modulating semi-determinate stem growth through artificial selection in soybean. *PLOS Genet.*, 12: e1005818.

9. Ping, J.#, Fitzgerald, J.C.#, Zhang, C.#, Lin, F., Bai, Y., Wang, D., Aggarwal, R., Rehman, M., Crasta, O., and **Ma J.** **2016**. Identification and molecular mapping of *Rps11*, a novel gene conferring resistance to *Phytophthora sojae* in soybean, *Theor. Appl. Genet.* 129: 445-451.
10. Sun, L.#, Miao, Z.#, Cai, C.#, Zhang, D., Zhao, M., Wu, Y., Zhang, X., Swarm., S.A., Zhou, L., Zhang, Z.J., Nelson, R.L., and **Ma, J.\*** **2015**. GmHs1-1, encoding a calcineurin-like protein, controls hard-seededness in soybean. *Nature Genetics* 47: 939-943.
11. Zhao, M., Meyers, B.C., Cai, C., Xu, W., and **Ma, J.\*** **2015**. Evolutionary Patterns and Co-evolutionary Consequences of MIRNA Genes and MicroRNA Targets Triggered by Multiple Mechanisms of Genomic Duplications in Soybean. *Plant Cell*, 27: 546-562.
12. Zhao M., Zhai J., Lin F., Li L., Cai C., Shreve J., Thimmapuram J., Hughes T.J., Meyers B.C., and **Ma, J.\*** **2015**. Coordination of microRNAs, phasiRNAs, and NB-LRR genes in immune responses: insights from analyses of soybean Rps gene near-isogenic lines. *Plant Genome*, 8: 10.3835.
13. Wang, Z., Zhou, Z., Liu, Y., Shen, Y., Liu, T., Ji, Li, Q., Wu, M., **Ma, J.\***, and Tian, Z.\* **2015**. Functional evolution of phosphatidylethanolamine-binding proteins (PEBPs) in soybean and Arabidopsis. *Plant Cell* 26: 996-1008.
14. Li, Y.#, Zhou, G.#, **Ma, J.#**, Jiang, W., (29 more authors) Li, R.\* , and Qiu, L.\* **2014**. *De novo* assembly of soybean wild relatives for pan-genome analysis of diversity and agronomic traits. *Nature Biotechnology*. 32: 1045-1054 [
15. Ping, J.#, Liu, Y.#, Sun, L.#, Zhao, M., Lin, F., Sui, Y., She, M., Nelson, R.L., Clemente, T., Specht, J., and **Ma, J.\*** **2014**. *Dt2* is a gain-of-function MADS-domain factor gene that specifies semi-determinacy in soybean. *Plant Cell*, 26: 2831-2842.
16. Chalhoub, B.\*, Denoeud, F., Liu, S., Zhou, Y., ... Zhao, M., ... **Ma, J.**, ... (many other authors), and Wincker, P. **2014**. Early allopolyploid evolution in the post-neolithic *Brassica napus* oilseed genome. *Science*, 345: 950-953.
17. Liu, S.\* , Liu, Y., Yang, X., Tong, C., Edwards, D., Isobel, P., Zhao, M., **Ma, J.**, (77 more authors), and Paterson, A.\* **2014**. The *Brassica oleracea* genome reveals the asymmetrical evolution of polyploid genomes. *Nature Communications* 10.1038/ncomms4930.
18. Lin, F.#, Zhao, M.#, Baumann, D.D., Ping, J., Sun, L., Liu, Y., Zhang, Biao, Tang, Z., Hughes, E., Doerge, R.W., Hughes, T.J., and **Ma, J.\*** **2014**. Molecular response to the pathogen *Phytophthora sojae* among ten soybean near isogenic lines revealed by comparative transcriptomics. *BMC Genomics* 15: 18.
19. Zhao, M., Du, J., Lin, F., Tong, C., Yu, J., Huang, S. Wang, X. Liu, S.\* **Ma, J.\*** **2013**. Shifts in evolutionary rate and intensity of purifying selection between two Brassica genomes revealed by analyses of orthologous retrotransposons and relics of a whole genome triplication. *Plant Journal* 76: 211-222.
20. Zhao, M., and **Ma, J.\*** **2013**. Co-evolution of plant LTR-retrotransposons and their host genomes. *Protein Cell* 4: 493-501.
21. Lin, F., Zhao, M., Ping, J., Johnson, A., Zhang, B., Abney, T.S., Hughes, T.J.\* , and **Ma, J.\*** **2013**. Molecular mapping of two genes conferring resistance to *Phytophthora sojae* in a soybean landrace PI 567139B. *Theor. Appl. Genet.* 126: 2177-2185.

22. Motamayor, J.C.\*, Mockaitis, K., Schmutz, J., Haiminen, N., Livingstone, D. 3rd, Cornejo, O., Findley, S.D., Zheng, P., Utro, F., Royaert, S., Saski, C., Jenkins, J., Podicheti, R., Zhao, M., (10 more authors), **Ma, J.**, Bustamante, C.D., Schnell, R.J., Main, D., Gilbert, D., Parida, L., Kuhn, D.N. **2013**. The genome sequence of the most widely cultivated cacao type and its use to identify candidate genes regulating pod color. *Genome Biology* 14: R53.
23. Li, Y.H. #, Zhao, S.C. #, **Ma, J.** #, Li, D., Yan, L., Li, J., Qi, X.T., Guo, X.S., Zhang, L., He, W.M., (24 more authors), Qiu, L.J. \* **2013**. Molecular footprints of domestication and improvement in soybean revealed by whole genome re-sequencing. *BMC Genomics* 14: 579.
24. Zhao, M., Zhang, B., Liu, S.-Y., and **Ma, J.**\* **2013**. Transposon expression and potential effect on gene regulation in the *Brassica rapa* and *Brassica oleracea* genomes. *Hereditas* 35: 1014-1022.
25. Yin, H., Liu, J., Xu, Y., Liu, X., Zhang, S., **Ma, J.**, Du, J.\* **2013**. TARE1, a mutated *copia*-Like LTR retrotransposon followed by recent massive amplification in tomato. *PLOS One* 8: e68587.
26. Tian, Z., Zhao, M., She, M., Du, J., Cannon, S.B., Liu, X., Xu, X., Qi, X., Li, M.W., Lam, H.M., and **Ma, J.**\* **2012**. Genome-wide characterization of nonreference transposons reveals evolutionary propensities of transposons in soybean. *Plant Cell* 24: 4422-4436.
27. Zhuang, X., Köllner, T., Zhao, N., Li, G., Jiang, Y., Zhu, L., **Ma, J.**, Degenhardt, J. Chen, F.\* **2012**. Dynamic evolution of herbivore-induced sesquiterpene biosynthesis in sorghum and related grass crops. *Plant Journal* 69: 70-80.
28. Du, J., Tian, Z., Sui, Y., Zhao, M., Song, Q., Cannon, S.B., Cregan, P., and **Ma, J.**\* **2012**. Pericentromeric effects shape the patterns of divergence, retention, and expression of duplicated genes in the paleopolyploid soybean (*Glycine max* (L.)). *Plant Cell* 24: 21-32.
29. Li, X., Zhu, C., Lin, Z., Wu, Y., Zhang, D., **Ma, J.**, Song, W., Bai, G., Muehlbauer, G., Scanlon, M., Zhang, M., and Yu, J. \* **2011**. Conservative boundaries of chromosome size variation in Eukaryotes. *Mol. Bio. Evol.* 28: 1901-1911.
30. Tian, Z., Yu, Y., Lin, F., Yu, Y.-S., SanMiguel, P., Wing, R.A., McCouch, S., **Ma, J.**\*, and Jackson, S.A.\* **2011**. Exceptional lability of a genomic complex of rice and its close relatives. *BMC Genomics* 12: 142.
31. Kim, M.Y., Lee, S., Van, K., Kim, T.-H., Jeong, S.-C., Choi, I.-Y., Kim, D.-S., Lee, Y.-S., Park, D., **Ma, J.**, (18 more authors), and Lee, S.-H.\* **2010**. Whole-genome sequencing and intensive analysis of the undomesticated soybean (*Glycine soja* Sieb. and Zucc.) genome. *Proc. Natl. Acad. Sci. USA* 107: 22032-22037.
32. Du, J., Tian, Z., Christian, H., Laten, H., Jackson, S., Cannon, S., Shoemaker, R.C.\*, and **Ma, J.**\* **2010**. Evolutionary conservation, diversity and specificity of LTR-retrotransposons in flowering plants: new insights from genome-wide analysis and multi-specific comparison. *Plant Journal* 63: 584-598.
33. Sanyal, A., Jetty, A.S.S., Lu, F., Yu, Y. Rambo, T., Currie, J., Kollura, K., Kim, H.R., Chen, J., **Ma, J.**, SanMiguel, P., Chen, M., Wing, R.A., Jackson, S.A.\* **2010**. Orthologous comparisons of the *Hdl* region across genera reveal *Hdl* gene lability within diploid *Oryza* species and disruptions to microsynteny in sorghum *Mol. Bio. Evol.* 27: 2487-2506.
34. Tian, Z., Wang, X., Lee, R., Li, Y., Specht, J., Nelson, R., McClean, P \*, Qiu, L.\*, and **Ma, J.**\* **2010**. Artificial selection for determinate growth habit in soybean. *Proc. Natl. Acad. Sci. USA* 107: 8563-8568.

35. Findley, S.D., Cannon, S., Varala, K., Du, J., **Ma, J.**, Hudson, M., Birchler, J., and Stacey, G.\* **2010**. A soybean paint-by-numbers kit: a fluorescence in situ hybridization karyotyping system. *Genetics* 185: 727-744.
36. The International Brachypodium Initiative. **2010**. Genome sequencing and analysis of the model grass *Brachypodium distachyon*. *Nature* 463: 763-768.
37. Du, J., Grant, D., Tian, Z., Nelson, R.T., Zhu, L., Shoemaker, R.C.\*, and **Ma, J.\*** **2010**. SoyTEdb: a comprehensive database of transposable elements in the soybean genome. *BMC Genomics* 11: 113.
38. Schmutz, J., Cannon, S.B., Schlueter, J., **Ma, J.**, ... Du, J., Tian, Z., Zhu, L., (20 more authors), Rokhsar, D., R.C. Shoemaker, R.C., Jackson, S.A.\* **2010**. Genome sequence of the paleopolyploid soybean (*Glycine max* (L.) Merr.). *Nature* 463: 178-183.
39. Du, J., Tian, Z., Schmutz, J., Bowen, N.J., Shoemaker, R.C., and **Ma, J.\*** **2010**. Bifurcation and enhancement of autonomous-nonautonomous retrotransposon partnership through LTR swapping in soybean. *Plant Cell* 22: 48-61.
40. Tian, Z.#, Rizzon, C.#, Du, J., Zhu, L., Bennetzen, J.L., Jackson, S.A.\*, Gaut, B. \*, and **Ma, J.\*** **2009**. Do genetic recombination and gene density shape the pattern of DNA elimination in rice LTR-retrotransposons?. *Genome Res.* 19: 2221-2230.

#### **Book Chapters:**

1. Zhao M, and **Ma, J.** **2017**. Transposable Elements of Brassica, In: The Brassica Genomes, eds. Wang, X., and Liu S. Springer, Wiley-Blackwell, Taylor and Francis. (in press).
2. Zhao, M, and **Ma, J.** **2017**. Transposable elements. In: H.T. Nguyen and M.K. Bhattacharyya (eds.), The Soybean Genome, Springer International Publishing, pp171-181.
3. **Ma, J.** **2013**. Retrotransposons. In: Stanley, M., and Kelly, H., (eds). *Brenner's Encyclopedia of Genetics*, 2nd edition, Vol. 6., San Diego, Academic Press, pp. 208-210.
4. **Ma, J.** Jackson, S.A., Cannon, S. and Shoemaker, R.C. **2009**. Comparative genomics of soybean. In, Bilyeu, K., Ratnaparkhe, M.B., and Kole, C. (ed.), Genetics, Genomics and Breeding in Soybean, Science Publisher, Inc. pp395-410.
5. Wing, R.A., Kim, H.R., Goicoechea, J.L., Yu, Y., Kudrna, D., Zuccolo, A., Jetty, S.S.A., Luo, M., Nelson, W., **Ma, J.**, SanMiguel, P., Hurwitz, B., Ware, D., Brar, D., Mackill, D., Soderlund, C., Stein, L., and Jackson, S.A. **2006**. Resource for comparative genome studies within *Oryza*. In Upadhyaya, N.M. (ed.) Rice Functional Genomics. Springer, pp. 395-410.

#### **Invited Lectures:**

Summary: Approximately 80 invitations at regional, national and international conferences and academic institutions in China, France, Japan, South Korea, UK, and the US; Chair/Co-Chair/Advisory Coommittee Member of ~20 workshop or conferences since 2008.

#### **Press Release and Media Coverage**

1. 01/2018 News release by Purdue News Services: "[Study suggests new targets for improving soybean oil content](#)".
2. 01/2018 News release by Purdue News Services: "[Study uncovers distinctions in major crop genome evolutions](#)".
3. 09/2017 West Lafayette WLFI 18 TV News: "[Purdue science team discovery could benefit](#)".

- [soybean farmers](#)".
4. 09/2017 News release by Purdue News Service: "[Breakthrough soybean research by Purdue and Dow AgroSciences could save farmers millions](#)".
  5. 04/2016 News release by Purdue News Service: "[Agronomist Ma earns Purdue Agricultural Research Award](#)".
  6. 06/2015. News release by Purdue News Service: "[Researchers identify gene that controls soybean seed permeability, calcium content](#)".
  7. 07/2014 News release by Purdue News Service: "[Gene discovery could lead to better soybean varieties for northern United States](#)".
  8. 07/2014 Commentary article by Dr. Jennifer Lockhart, the Scientific Editor of Plant Cell: "[Finding Dt2, the dominant gene that specifies the semi-determinate growth habit in soybean](#)".
  9. 10/2013 Interviewed by Country Guide – AgCanada, a Canadian agricultural magazine: "[New find in genetic resistance - with Phytophthora resistance breaking down in the U.S. and Canada, this tool may be just in time](#)".
  10. 09/2013 Featured by Indiana Prairie Farmer: "Discovery could harness soybean disease".
  11. 07/2013 News release by Purdue New Service: "[Researchers discover genes resistant to soybean pathogen](#)".
  12. 07/2013 Featured by Farm Progress Magazine: "Soybean discovery holds promise".
  13. 03/2012 Featured by Farm Progress Magazine: "Why more diversity could lead to higher soybean yields".
  14. 10/2010 Interviewed by the United Soybean Board magazine: Beyond the Bean "Mapping the way to faster trait development".
  15. 09/2010 Featured by Purdue Agriculture magazine: "Genetic find may improve soybean".
  16. 07/2010 Featured by Farm Progress Magazine: "Gene controls stem growth for soybeans".
  17. 04/2010 Commentary article by Dr. Jennifer Mach, the Scientific Editor of Plant Cell: "[Retrotransposon domain swapping](#)".
  18. 04/2010 News release by Purdue News Service: "[Gene discovery may lead to new varieties of soybean plants](#)". This story was posted/adapted by FAO, NSF, Science News, and >100 additional national and international media, and commented by the reviewers of PNAS as "a story that should definitely be taught to undergraduate students".
  19. 01/2010 News release by Purdue News Service: "[Genome sequencing speeds ability to improve soybeans](#)". The Ma lab contributed to annotation and analysis of 60% of the soybean genome (Schmutz et al. 2010, Nature), which was not only the essential part of the soybean genome annotation, but also the key to accurate prediction of a full set of soybean genes. The news was posted/adapted by NSF, DOE, USDA, and >100 additional media.

### **Mentoring of Students/Professionals**

Serving/served as Major or co-Major Graduate Advisees (14):

Completed Ph.D: 8 (Purdue)

Ph.D. candidates: 2 and M.S. candidate: 1 (Purdue)

Completed visiting Ph.D: 3 (Research dissertation work was conducted at Purdue)

Graduate Student Awards (9, excluding 6 travel awards):

Outstanding Ph.D. Graduate Research Award (2018), Department of Agronomy, Purdue University  
Dow AgroSciences Scholarship (2017), Department of Agronomy, Purdue University  
Ross Fellowship (2015), Graduate School, Purdue University  
Nyquist Scholarship Award (2015), Department of Agronomy, Purdue University  
Outstanding Ph.D. Graduate Research Award (2015), Department of Agronomy, Purdue University  
Excellent Poster Award (2<sup>nd</sup> Place), Soybean Breeders Workshop, 2013  
Nyquist Scholarship Award (2012), Department of Agronomy, Purdue University;  
Outstanding Research Award (2012) to Dr. Ma's visiting Ph.D student Ms. Meixia Zhao, CAAS  
United Soybean Board Research Fellowship (2009-2013)

Graduate Advisory Committee Member/Prelim Chair (16):

Agronomy, Purdue: 9  
PULSe program/Botany and Plant Pathology, Purdue: 3  
Forestry and Natural Resources, Purdue: 2  
Biology and Plant Pathology, Purdue: 2  
Crop Science, University of Illinois, Urbana-Champaign: 1

Undergraduate student mentees (20):

Capstone project: 4  
Summer Stay program: 1  
Part-time student workers: 10  
Department-assigned non-working students: 5

Postdoctoral Associates/Visiting Scholars (16):

Previous Postdoctoral Associates: 9 (5 have become PIs/Faculty members)  
Current Postdoctoral Associate: 3  
Previous Visiting Scholars/Scientists: 3  
Current Visiting Scholar/Scientist: 1

**Teaching Activities**

AGRY320 Introductory Genetics:

Since 2009, Spring semester. Serving/served as administrative instructor with Dan Szymanski/Jeff Stuart/Chris Bidwell/Brenda Owen/Joe Anderson; taught >1,500 students.

AGRY480 Plant Genetics:

Since 2010, Fall semester. Serving/served as administrative instructor with Herb Ohm/Torbert Rocheford; taught >80 students.

AGRY600 Genomics:

2006, Fall semester. Delivered 6 guest lectures for Dr. Scott Jackson.