

Curriculum Vitae

Wusheng Liu, Ph.D.

Department of Horticultural Science
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EDUCATION

Ph.D. in Botany, University of Tennessee, Knoxville, TN, 2007

M.S. in Botany, Northeast Forestry University, Harbin, China, 1996

B.S. in Landscape Architecture, Northeast Forestry University, Harbin, China, 1993

PROFESSIONAL EXPERIENCE

- 07/2024 – *present* **Associate Professor** in Translational Genomics & Plant Bioengineering, Department of Horticultural Science, North Carolina State University (70% research, 25% teaching and mentoring, and 5% service)
- 01/2018 – 06/2024 **Assistant Professor** in Translational Genomics & Plant Bioengineering, Department of Horticultural Science, North Carolina State University (70% research, 25% teaching and mentoring, and 5% service)
- 12/2015 – 12/2017 **Research Assistant Professor** in Plant Biotechnology & Plant Synthetic Biology, Department of Plant Sciences, University of Tennessee, Knoxville (100% research)
- 09/2008 – 11/2015 **Post Doctoral Research Associate, Ivan Racheff Chair of Excellence**, Department of Plant Sciences, University of Tennessee, Knoxville
- 07/2007 – 08/2008 **Post Doctoral Research Associate**, Department of Biochemistry & Cellular & Molecular Biology, University of Tennessee, Knoxville
- 12/2004 – 12/2006 **Graduate Teaching Assistant**, Department of Ecology & Evolutionary Biology, University of Tennessee, Knoxville
- 08/2000 – 11/2004 **Graduate Assistant**, Department of Botany, University of Tennessee, Knoxville
- 08/1998 – 07/2000 **Lecturer**, College of Forestry Resources & Environment, Beijing Forestry University, Beijing, China
- 07/1996 – 07/1998 **Assistant Lecturer**, College of Forestry Resources & Environment, Beijing Forestry University, Beijing, China

PROFESSIONAL MEMBERSHIPS

- American Society of Horticultural Science (ASHS).

HONORS AND AWARDS

- **Fellow, the inaugural ASHS Leadership Academy, 2021.**
- **First Place, ASHS Early Career Competition Award, 2021.**

- Liu et al. (2020) was recommended by **F1000**.
- **Winner** of the **travel award for U.S. Early Career Scientists** from the 28th International Conference of Arabidopsis Research (ICAR), St. Louis, MO, 2017.
- The **Cover Photo** on *Plant Biotechnology Journal* 12 (4), 2014.
- **Winner** of the inaugural **Ivan Racheff Chair of Excellence Best Paper of the Year Award**, University of Tennessee, 2013.
- The **Featured Article** on *Nature Reviews Genetics* 14 (11), 2013.
- The **Cover Photo** on *Plant Biotechnology Journal* 11 (9), 2013.
- The **Cover Photo** on *Plant Biotechnology Journal* 11 (5), 2013.

TEACHING

- Modified an existing course HS/GN/CS 720 ‘Molecular biology in plant breeding’ and taught it in Spring 2021 - *present* (Solo-instructor; 3 credit hours).
- Developed and taught a new course HS 495/590 ‘Biotechnologies for crop improvement’ (3 credit hours; Spring 2020).
- Guest Lecture and Panelist in the High School Biology Teacher Training Workshop taught by Dr. Anna Stepanova, Department of Plant & Microbial Biology, NCSU, July 24, 2023.
- Guest Lecture and Panelist in the High School Biology Teacher Training Workshop taught by Dr. Anna Stepanova, Department of Plant & Microbial Biology, NCSU, July 24, 2022.
- Guest lecture, ‘Genetic editing of horticultural crops: Opportunities and constraints’ in HS703 ‘Breeding asexually propagated crops’ taught by Dr. Craig Yencho. April 22, 2021.
- Guest lecture, ‘The beauty of plant biotechnology’ in Horticultural Science Summer Institute at NCSU taught by Liz Driscoll. July 10, 2019.
- Guest lecture, ‘The future of plant biotechnology: genome editing and concluding perspectives’ in HS 703 ‘Breeding asexually propagated crops’ taught by Dr. Craig Yencho. April 18, 2019.

FUNDING GRANTS (Total = \$4.37 M, To Liu’s program at NCSU = \$2.7 M)

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| 2024 – 2026 | NC Department of Agriculture. Liu, W. (PI), Ranney, T., Yuan, W., Da, K., Huang, D. \$100,000. |
| 2023 – 2027 | USDA-NIFA. Liu, W. (PI), Hsieh, T. \$650,000. |
| 2023 – 2026 | Bill & Melinda Gates Research Foundation. Liu, W. (PI), Yencho, C., Iglesias, C., Da, K., Duduit, J., Huang, D., Wei, Q. \$495,895. |
| 2023 | NCSU Plant Breeding Research and Equipment Funding. Liu, W. (PI), Huang, D., Duduit, J. \$10,000. |
| 2023 – 2026 | USDA-ARS. Ranney, T. (PI), Liu, W. , Da., K. \$800,000. |
| 2022 – 2027 | USDA-ARS. Liu, W. (PI), Da, K. \$60,000. |

- 2022 – 2023 NCSU GAANN Molecular Biotechnology Fellowship. \$80,000.
- 2023 NC Biotechnology Center Flash Program. **Liu, W.** (PI), Huang, D. \$20,000.
- 2022 NC Biotechnology Center Flash Program. **Liu, W.** (PI), Yencho, C., Iglesias, C., Da, K., Maren, N., Kosentka, P., Duduit, J. \$20,000.
- 2022 NC Biotechnology Center Flash Program. Ashrafi, H. (PI), **Liu, W.**, Da, K., Spencer, J. \$20,000.
- 2021 – 2023 BASF. **Liu, W.** (PI) \$250,000.
- 2021 – 2023 NCDACS New and Emerging Crops Program. Ranney, T. (PI), Touchell, D., Da, K., **Liu, W.**, Davis, J.M., Suchoff, D.H. \$80,100.
- 2021 – 2023 Southern IPM Enhancement Grants. **Liu, W.** (PI), Louws, F., Duduit, J. \$30,000.
- 2020 – 2022 USDA-AFRI Agricultural Innovations through Genome Editing Program. **Liu, W.** (PI) \$200,000.
- 2020 – 2022 BASF. Hernandez, R. (PI), **Liu, W.** \$232,000.
- 2020 – 2022 NCSU Plant Breeding Research and Equipment Funding. **Liu, W.** (PI), Yencho, C., Kosentka, P., Duduit, J. \$28,000.
- 2020 – 2021 NC Crop Improvement Association. Ranney, T. (PI), Touchell, D., **Liu, W.**, \$12,000.
- 2019 NCSU Stuber Grant. **Liu, W.** (PI), Panthee, D., Veazie-Perkins, P. \$12,500.
- 2019 – 2022 USDA-NIFA Special Research Grants Program – Potato Breeding Research. Yencho, C. (PI), Clough, M., **Liu, W.** \$167,562.
- 2019 – 2024 USDA-ARS Floral and Nursery Research Initiative (FNRI) Program. **Liu, W.** (PI), Ranney, T., Ashrafi, H., Touchell, D. \$338,177.
- 2019 – 2022 Foundation for Food and Agriculture Research (FFAR) Fellows Program and Syngenta. \$195,000.
- 2019 Vindara Inc. Hernandez, R. (PI), **Liu, W.** \$32,000.
- 2019 NCSU CALs CRC Equipment Funds. **Liu, W.** (PI), Yencho, C., Ranney, T., Fernandez, G., Ashrafi, H., Meyer, E., Neal, J., Gunter, C.C., Hoffmann, M. \$12,337.
- 2018 – 2019 NC Tomato Growers Association. **Liu, W.** (PI), Panthee, D., Veazie-Perkins, P. \$1,400.

PRIOR TO NCSU -----

- 2017 Tennessee Soybean Promotion Board. Stewart, C.N., Jr. (PI), **Liu, W.**, Mazarei, M. \$20,000.
- 2016 – 2019 USDA-NIFA Biotechnology Risk Assessment Research (BRAG) Program. **Liu, W.** (PI); Johnson, J. \$465,000 (non-cost extension; \$266,094 to NCSU).
- 2013 AgResearch Innovation Grant, University of Tennessee. Stewart, C.N., Jr. (PI), **Liu, W.** \$20,000.
- 2013 UTRF Technology Maturation Fund, University of Tennessee. Stewart, C.N., Jr. (PI), **Liu, W.** \$15,000.

PATENTS (Total = 5, NCSU = 4)

Issued:

1. **Inducible Plant Promoters and the Use Thereof.** U.S. Patent 9,157,087. Issued Oct. 13, 2015. Inventors: Stewart, C.N., Jr., **Liu, W.**, Mazarei, M. *US provisional patent applied for June 28 2012; converted 3/11/2013 US 13/794,255.*

Pending:

1. **Cell Suspension, Plant Regeneration via Somatic Embryogenesis in Rose (*Rosa hybrida* L.).** Da, K., **Liu, W.**, Ranney, T.

Disclosures:

1. **Engineered cleistogamy in *Camelina sativa* for bioconfinement.** Inventors: **Liu, W.**, Huang, D.
2. **Transgene-Free Gene Editing in Tomato Using Magnetic Nanoparticles and Pollen Magnetofection.** Inventors: **Liu, W.**, Huang, D., Yench, C., Ranney, T., Da, K.
3. **Novel Constitutive Promoter Motifs for Dicot Species.** Inventors: Brooks, E., **Liu, W.**, Huang, D., Ranney, T.

REFEREED PUBLICATIONS (Total = 44, NCSU = 27)

* , corresponding author. †Co-first authors. *The undergraduate and graduate students trained under me are underlined and dotted underlined, respectively.*

1. Wang, Y., Yang, X., Wang, W., Wang, Y., Chen, X., Wu, H., Gao, Z., Xu, H., Liu, T., Li, Y., Xiao, D., **Liu, W.***, Hou, X.* , Zhang, C.* Efficient transformation and gene editing of Chinese cabbage via *Agrobacterium rhizogenes*-mediated callus induction and regeneration. *Plant Physiology* (In print)
2. Wang, H., Zheng, Y., Wang, M., **Liu, W.**, Li, Y., Xiao, D., Liu, T., Hou, X. BcWRKY33A promotes root development through directly upregulating *BcLRPI* and *BcCOW1* expression in Bok choy. *Horticulture Research* (Resubmitted)
3. Zhao, F., Wang, Y., Cheng, W., Antwi-Boasiako, A., Yan, W., Zhang, C., Gao, X., Kong, J., **Liu, W.**, Zhao, T. Genome-wide association study of bacterial blight resistance in soybean. *Plant Disease* (Resubmitted)
4. Brooks, E.G., Elorriaga, E., Liu, Y., Duduit, J.R., Yuan, G., Tsai, C.-J., Tuskan, G.A., Ranney, T.G., Yang, X., **Liu, W.*** (2023) Plant promoters and terminators for high-precision bioengineering. *BioDesign Research* 5:0013 (Invited review)
5. Huang, D., Gao, L., McAdams, J., Zhao, F., Lu, H., Wu, Y., Martin, J., Sherif, S.M., Subramanian, J., Duan, H., **Liu, W.*** (2023) Engineered cleistogamy in *Camelina sativa* for bioconfinement. *Horticulture Research* 10:uhac280.
6. Chen, X., Liu, C., Guo, P., Hao, X., **Liu, W.**, Zhao, L., Pan, Y., Luo, W., He, J., Su, Y., Jin, T., Jiang, F., Wang, S., Liu, F., Xie, R., Zhen, C., Han, W., Wang, W., Zhao, S., Li, Y., Gai, J. (2023) Differential allelic effects and genetic backgrounds contribute to increased seed weight after soybean domestication. *Journal of Integrative Plant Biology* 00:1-20.
7. Harmon, D.D., Chen, H., Byrne, D., **Liu, W.**, Ranney, T.G. (2023). Cytogenetics, ploidy, and genome sizes of rose (*Rosa* spp.) cultivars and breeding lines. *Ornamental Plant Research* 3:10.

8. Maren, N.A., Aryal, R., Touchell, D.H., Ming, R., **Liu, W.**, Ashrafi, H., Zhang, X., Ranney, T.G. (2023) A genomic reference assembly of Ravenna grass (*Tripsidium ravennae*). *G3* 22:483.
9. Liao, X., Ye, Y., Zhang, X., Peng, D., Hou, M., Fu, G., Tan, J., Zhao, J., Jiang, R., Xu, Y., Liu, J., Yang, J., **Liu, W.**, Tembrock, L.R., Zhu, G., Wu, Z. (2022) The genomic and bulked segregant analysis of *Curcuma alismatifolia* revealed its diverse bract pigmentation. *aBIOTECH* 3:178-196.
10. Sultana, S., Mazarei, M., Millwood, R.J., **Liu, W.**, Hewezi, T. Stewart, C.N. Jr. (2022) Functional analysis of soybean cyst nematode-inducible synthetic promoters and their regulation by biotic and abiotic stimuli in transgenic soybean (*Glycine max*). *Frontiers in Plant Science* 13:988048.
11. Harmon, D.D., Touchell, D.H., Ranney, T.G., Da, K., **Liu, W.** (2022) Tissue culture and regeneration of three rose cultivars. *HortScience* 57:1430-1435.
12. Zhang, C., Zhou, Q., **Liu, W.**, Wu, X., Li, Z., Xu, Y., Li, Y., Imaizumi, T., Liu, T., Hou, X. (2022) BrABF3 positively regulates flowering time through the direct activation of *CONSTANS* transcription in Pak choi. *Plant Journal* 111:134-148.
13. Duduit, J.R., Kosentka, P.Z., Miller, M.A., Blanco-Ulate, B., Lenucci, M.S., Panthee, D.R., Perkins-Veazie, P., **Liu, W.*** (2022) Coordinated transcriptional regulation of the carotenoid biosynthesis contributes to fruit lycopene content in high-lycopene tomato genotypes. *Horticulture Research* 9:uhac084.
14. Maren, N.A., Duan, H.*, Da, K., Yencho, G.C., Ranney, T.G., **Liu, W.*** (2022) Genotype-independent plant transformation. *Horticulture Research* 9:uhac047 (Invited review).
15. Zhao, F., Cheng, W., Wang, Y., Gao, X., Huang, D., Kong, J., Antwi-Boasiako, A., Zheng, L., Yan, W., Chang, F., Kong, K., Liao, Y.-Y., Huerta, A.I., **Liu, W.**, Zhang, M., Zhao, T. (2022) Identification of novel genomic regions for bacterial leaf pustule (BLP) resistance in soybean (*Glycine max* L.) via integrating linkage mapping and association analysis. *International Journal of Molecular Sciences* 23:2113.
16. Duan, H.*, Maren, N.A., Ranney, T.G., **Liu, W.*** (2022) Opportunities for the use of growth and developmental regulator genes in genetic transformation of ornamental plants. *Ornamental Plant Research* 2:4. (Invited review)
17. Zhao, F., Maren, N.A., Kosentka, P.Z., Liao, Y.-Y., Lu, H., Duduit, J.R., Huang, D., Ashrafi, H., Zhao, T., Huerta, A.I., Ranney, T.G., **Liu, W.*** (2021) An optimized protocol for stepwise optimization of real-time RT-PCR analysis. *Horticulture Research* 8:179.
18. Maren, N.A., Zhao, F., Aryal, R., Touchell, D.H., **Liu, W.**, Ranney, T.G., Ashrafi, H. (2021) Reproductive developmental transcriptome analysis of *Tripsidium ravennae* (Poaceae). *BMC Genomics* 22:483.
19. Huang, D., Kosentka, P.Z., **Liu, W.*** (2021) Synthetic biology approaches in regulation of targeted gene expression. *Current Opinion in Plant Biology* 63:102036. (Invited review)
20. Yang, Y., Lee, J., Poindexter, M., Shao, Y., **Liu, W.**, Lenaghan, S., Ahkami, A., Blumwald, E., Stewart, C.N. Jr. (2021) Rational design and testing of abiotic stress inducible synthetic promoters from poplar *cis*-regulatory elements. *Plant Biotechnology Journal* 19:1354-1369.

21. **Liu, W.***, Rudis, M.R., Cheplick, M.H., Millwood, R.J., Yang, J.-P., Ondzighi-Assoume, C.A., Montgomery, G.A., Burris, K.P., Mazarei, M., Chesnut, J.D., Stewart, C.N., Jr.* (2020) Lipofection mediated genome editing using DNA-free delivery of the Cas9/gRNA ribonucleoprotein into plant cells. *Plant Cell Reports* 39:245-257.
 – Recommended by F1000.
22. Wang, H., Xie, Y., **Liu, W.**, Tao, G., Sun, C., Sun, X., Zhang, S. (2020) Transcription factor LkWOX4 is involved in adventitious root development in *Larix kaempferi*. *Gene* 758:144942.
23. Lu, H., Luo, Z., Wang, L., **Liu, W.**, Li, D., Belwal, T., Xu, Y. and Li, L. (2020) FaMYB9 is involved in the regulation of C6 volatile biosynthesis in strawberry. *Plant Science* 293.
24. Ondzighi-Assoume, C.A., Willis, J.D., Ouma, W.K., Allen, S.M., King, Z., Parrott, W.A., **Liu, W.**, Burris, J.N., Lenaghan, S.C., Stewart, C.N., Jr. (2019) Embryogenic cell suspensions for high capacity genetic transformation and regeneration of switchgrass (*Panicum virgatum* L.). *Biotechnology for Biofuels* 12:1-14.
25. Yu, J., Gao, L., **Liu, W.**, Song, L., Xiao, D., Liu, T., Hou, X., Zhang, C. (2019) Transcription coactivator ANGUSTIFOLIA3 (AN3) regulates leafy head formation in Chinese cabbage. *Frontiers in Plant Science* 10:520. (†Co-first author)
26. **Liu, W.**†, Mazarei, M.†, Ye, R.†, Peng, Y., Shao, Y., Baxter, H.L., Sykes, R.W., Turner, G.B., Davis, M.F., Wang, Z.-Y., Dixon, R.A, Stewart, C.N., Jr. (2018) Switchgrass (*Panicum virgatum* L.) promoters for green tissue-specific expression of the *MYB4* transcription factor for reduced-recalcitrance transgenic switchgrass. *Biotechnology for Biofuels* 11:122. (†Co-first author).
27. Xu, W., **Liu, W.**, Ye, R., Mazarei, M., Zhang, X., Stewart, C.N., Jr. (2018) A *profilin* gene promoter from switchgrass (*Panicum virgatum* L.) directs strong and specific transgene expression to vascular bundles in rice. *Plant Cell Reports* 37:587-597.

PRIOR TO NCSU -----

28. **Liu, W.**, Stewart, C.N., Jr. (2016) Plant synthetic promoters and transcription factors. *Current Opinion in Biotechnology* 37:36-44.
29. Ye, R., Huang, H., Alexander, J., **Liu, W.**, Millwood, R.J., Wang, J., Stewart, C.N., Jr. (2016) Field studies of dynamic pollen production, deposition and dispersion from glyphosate-resistant horseweed (*Conyza canadensis*). *Weed Science* 64:101-111.
30. **Liu, W.**, Stewart, C.N., Jr. (2015) Plant synthetic biology. *Trends in Plant Science* 20:309-317.
31. **Liu, W.**, Mazarei, M., Peng, Y., Fethe, M.H., Rudis, M.R., Lin, J., Millwood, R.J., Arelli, P.R., Stewart, C.N., Jr. (2014) Computational discovery of soybean promoter *cis*-regulatory elements to enable the construction of soybean cyst nematode inducible synthetic promoters. *Plant Biotechnology Journal* 12:1015-1026.
32. Fethe, M.H., **Liu, W.**, Burris, J.N., Millwood, R.J., Mazarei, M., Rudis, M.R., Yeaman, D.G., Dubosquielle, M., Stewart, C.N., Jr. (2014) The performance of pathogenic bacterial phytosensing transgenic tobacco in the field. *Plant Biotechnology Journal* 12:755-764.

33. **Liu, W.**, Rudis, M.R., Peng, Y., Mazarei, M., Millwood, R.J., Yang, J.-P., Xu, W., Chesnut, J.D., Stewart, C.N., Jr. (2014) Synthetic TAL effectors for targeted enhancement of transgene expression in plants. *Plant Biotechnology Journal* 12:436-446. (Featured Cover)
34. **Liu, W.**, Yuan, J.S., Stewart, C.N., Jr. (2013) Advanced genetic tools for plant biotechnology. *Nature Reviews Genetics* 14:781-793. (Featured Article)
35. Lin, J., Mazarei, M., Zhao, N., Zhu, J., Zhuang, X., **Liu, W.**, Pantalone, R.V., Arelli, P.R., Stewart, C.N., Jr., Chen, F. (2013) Overexpression of a soybean salicylic acid methyltransferase gene confers resistance to soybean cyst nematode. *Plant Biotechnology Journal* 11:1135-1145. (Featured Cover)
36. **Liu, W.**, Mazarei, M., Rudis, M.R., Fethe, M.H., Peng, Y., Millwood, R., Shoene, G., Burris, J.N., Stewart, C.N., Jr. (2013) Bacterial pathogen phytosensing in transgenic tobacco and *Arabidopsis*. *Plant Biotechnology Journal* 11:43-52 (Featured Cover on *Plant Biotechnology Journal* 11 (5)).
37. Karve, R., **Liu, W.**, Willet, S.G., Torii, K.U., Shpak, E.D. (2011) The presence of multiple introns is essential for *ERECTA* expression in *Arabidopsis*. *RNA* 17:1902-1921.
38. Mazarei, M., **Liu, W.**, Al-Ahmad, H., Arelli, P.R., Pantalone, V.R., Stewart, C.N., Jr. (2011) Gene expression profiling of resistant and susceptible soybean lines infected with soybean cyst nematode. *Theoretical and Applied Genetics* 123:1193-1206.
39. Mann, D.G.J., King, Z., Liu, W., Joyce, B.L., Percifiel, R.J., Hawkins, J.S., LaFayette, P.R., Artelt, B.A., Burris, J.N., Mazarei, M., Bennetzen, J.L., Parrott, W.A., Stewart, C.N., Jr. (2011) Isolation and characterization of two switchgrass (*Panicum virgatum* L.) ubiquitin promoters (*PvUbi1* and *PvUbi2*) for use in monocot, dicot and fern transformation. *BMC Biotechnology* 11:74.
40. **Liu, W.**, Mazarei, M., Rudis, M.R., Fethe, M.H., Stewart, C.N., Jr. (2011) Rapid *In vivo* analysis of synthetic promoters for plant pathogen phytosensing. *BMC Biotechnology* 11:108.
41. Shaw, J., Lickey, E.B., Beck, J.T., Farmer, S.B., **Liu, W.**, Miller, J., Siripun, K.C., Winder, C.T., Schilling, E.E., Small, R.L. (2005) The tortoise and the hare II: relative utility of 21 noncoding chloroplast DNA sequences for phylogenetic analysis. *American Journal of Botany* 92:142 -166. (The #2 Most Cited paper in *American Journal of Botany*).
42. Zhuo, L., Wang, L., Chen, Q., **Liu, W.** (1999) Wild fruit resources and exploitation in Xiaoxing'an Mountains. *Journal of Forestry Research* 10:31-33.
43. Li, G., Zhang, Y., Wang, J., Liu, W. (1998) Investigation on the Medical Plant Resources of Beizhang Experimental Area in the Upper Reaches of Miyun Reservoir. *Quarterly of Forest By-Product And Speciality in China* 2:45-46.
44. Zhang, Y., Wang, J., **Liu, W.**, Li, G., Li, F. (1997) The preliminary study on the vegetation qualities of Beizhuang experimental area in the upper reaches of Miyun reservoir. *Journal of Beijing Forestry University* 19:39-44.

NON-REFEREED PUBLICATIONS (Total = 2, NCSU = 0)

1. Stewart, C.N., Jr., **Liu, W.** (2017) Synthetic promoters for precise control of gene

expression in plants. *Chemical Engineering Progress* 113:36-39.

2. Stewart, C.N., Jr., **Liu, W.** (2013) Deployable phytosensors for plant pathogen detection. *ISBNews Report*.

BOOK CHAPTERS (Total = 8, NCSU = 3)

1. **Liu, W.**, Huang, D., Stewart, C.N., Jr., Miki, B. (2016) Promoters and marker genes. *In: Plant Biotechnology and Genetics: Principles, Techniques and Applications*. Stewart, C.N., Jr. (Ed.), 2nd edition (textbook), Wiley and Sons, New Jersey, USA (*In print*)
2. Huang, D., Livengood, C., Yencho, G.C., **Liu, W.** Opportunities for gene editing of sweetpotato. *In: The Sweetpotato Genome*. Yencho, G.C., Olukolu, B., Isobe, S. (Eds.). (*In print*)
3. Maren, N.A., Duduit, J.R., Huang, D., Zhao, F., Ranney, T.G., **Liu, W.** (2023) Stepwise optimization of real-time RT-PCR analysis. *In: Methods in Molecular Biology: Plant Genome Engineering*. Harwood, W., Yang, B., Que, Q (Eds.), 2653: 317-332. Springer, New York, USA.

PRIOR TO NCSU -----

4. **Liu, W.**, Stewart, C.N., Jr. (2016) The Future: advanced plant biotechnology, genome editing and synthetic biology. *In: Plant Biotechnology and Genetics: Principles, Techniques and Applications*. Stewart, C.N., Jr. (Ed.), 2nd edition (textbook), Wiley and Sons, New Jersey, USA.
5. **Liu, W.**, Stewart, C.N., Jr. (2016) Plant systems biology. *In: Plant Biotechnology and Genetics: Principles, Techniques and Applications*. Stewart, C.N., Jr. (Ed.), 2nd edition (textbook), Wiley and Sons, New Jersey, USA.
6. **Liu, W.**, Stewart, C.N., Jr., Miki, B. (2016) Promoters and marker genes. *In: Plant Biotechnology and Genetics: Principles, Techniques and Applications*. Stewart, C.N., Jr. (Ed.), 2nd edition (textbook), Wiley and Sons, New Jersey, USA.
7. Zhuo, L., **Liu, W.**, Yang, W. (1994) Investigation and utilization of the wild fruit resources in Xiaoxing'an Mountains. *In: New Studies on Forest Management and Forest Resource Exploitation in Northeast China-Zhong Guo Dong Bei Lin Qu (1990-1994)*. Cui Xiao Yang & Wang Qing Wen (Ed.), Heilongjiang Science & Technology Press, Harbin, China, pp. 266-270.
8. Zhuo, L., Yang, W., **Liu, W.** (1994) Early spring wild herbal flower resources and its utilization in urban landscaping in Heilongjiang Province. *In: New Studies on Forest Management and Forest Resource Exploitation in Northeast China-Zhong Guo Dong Bei Lin Qu (1990-1994)*. Cui Xiao Yang & Wang Qing Wen (Ed.), Heilongjiang Science & Technology Press, Harbin, China, pp. 286-290.

LAB MEMBERS (Total = 63, NCSU = 35)

Current:

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|------------------|-----------------------------|
| Dr. Hongwei Jing | Research Associate (2024-) |
| Dr. Debao Huang | Research Associate (2021-) |

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| James Duduit | PhD graduate student (2020-), NCSU GAANN Molecular Biotechnology Fellow |
| Chase Livengood | MS graduate student (2023-) |
| Justine Mulig | MS graduate student (2023-), Fulbright Scholar |
| Morgan Miller | Research Specialist (2024-) |
| Sara Fink | Undergraduate research assistant (2022-) |
| Shannon Moore | Undergraduate research assistant (2023-) |
| Nick Curtis | Undergraduate research assistant (2024-) |
| <i><u>Former:</u></i> | |
| Dr. Debao Huang | Postdoc (2019-2021), currently Research Associate, NCSU |
| Dr. Nathan Maren | Postdoc (2020-2022), currently Ornamental Breeder in Morton Arboretum, IL |
| Dr. Estefania Elorriaga | Postdoc (2022), currently Postdoc at NCSU |
| Dr. Pawel (Paul) Kosentka | Postdoc (2018-2020), currently Postdoc in Bayer, St Louis, MO |
| Meghan Roche | PhD graduate student (2019-2024; with Dr. Ricardo Hernandez) |
| Asa Budnick | Rotation PhD graduate student (2021) |
| Sihui Ni | MHS graduate student (2024; with Dr. Craig Yencho), FFAR Fellow |
| Anna Nelson | MS graduate student (2022- 2023), currently Research Specialist at PTL, NCSU; Undergraduate research assistant (2021), 2021 Outstanding Senior in Horticultural Science Department, NCSU |
| Emily Brooks | MS graduate student (2020-2022), currently Laboratory Manager and Research Associate in Ingateygen, NC |
| Davis Harmon | MS graduate student (2020-2022; with Dr. Tom Ranney), currently Ornamental Breeder in Spring Meadow Nursery, MI |
| James Duduit | MS graduate student (2018-2020), currently PhD graduate student in the Liu laboratory |
| Ruth Jammalamadugu | Undergraduate research assistant (2024) |
| Mia Barbieri | Undergraduate research assistant (2021-2023); Temporary technician (2024), 2023 Outstanding Senior in Horticultural Science Department, NCSU , currently Research Assistant in Elo Life Systems, Durham, NC |
| Amelia Brady | Undergraduate research assistant (2023) |
| Paulina Bonilla | Undergraduate research assistant (2021-2022), 2022 Outstanding Senior in Horticultural Science Department, NCSU , currently High School Biology Teacher |
| Rhett Pasour | Undergraduate research assistant (2021-2022) |
| Brady Farlow | Undergraduate research assistant (2021) |

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| Caroline Barrett | Undergraduate research assistant (2021), currently MS graduate student at NCSU |
| Jeremy McAdams | Undergraduate research assistant (2020-2021), currently Research Associate in Pairwise, Durham, NC |
| Morgan Miller | Undergraduate research assistant (2018-2020) |
| Via Abiera | Undergraduate research assistant (2019-2020) |
| Fangzhou Zhao | Visiting PhD student from Zhejiang University (2019-2021) |
| Hongyan Lu | Visiting PhD student from Zhejiang University (2019-2021) |
| Liwei Gao | Visiting PhD student from Nanjing Agricultural University (2017-2019), currently Assistant Professor (Lecturer) in Ganzhou Normal University, China |
| Xianlian Chen | Visiting PhD student from Nanjing Agricultural University (2018- 2019) |
| Yonghui Wu | Temporary technician (2017-2018), currently working for a company in China |

Researchers mentored at University of Tennessee, Knoxville:

Technician: Hua Yuan (2016-2017); Yonghui Wu (2017-2018)

Visiting Ph.D. student: Wenzhi Xu (2013-2014)

Ph.D. rotation student: Kristine G. Cabugao (2015)

M.S. student: Michael H. Fethe (2011-2013)

B.S. students: Ralph B. Laurel (2016-2017); Elgin H. Akin (2016-2017); Robert G. Sears (2017); Matthew H. Cheplick (2014-2016); Tammy L. Stackhouse (2015-2016); Kelsey E. Harrell (2016); Jessica S. Layton (2016); Colin G. Brice (2016); Elgin A. Henry (2016); Kacie N Reynolds (2015); Jacob L. Crawford (2015); Garret A. Montgomery (2014); David A. Schmidt (2013-2014); Michael H. Fethe (2010-2012); Andrew Moser (2012); Duncan G. Yeaman (2010); Paul Lee (2010)

Undergraduate Independent Studies: Tammy L. Stackhouse (2016); Kelsey E. Harrell (2016); Matthew H. Cheplick (2014); David A. Schmidt (2014); Micheal H. Fethe (2011);

High school student: Rana Hewezi (2013)

PROFESSIONAL SERVICES

On campus:

University Service:

- Faculty member, Plant Breeding Consortium, NCSU, 2018 – *present*.
- Graduate faculty, Biotechnology Program (BIT), NCSU, 2024 – *present*.
- Affiliated faculty, Genetics and Genomics Institute, NCSU, 2022 – *present*.
- Affiliated faculty, Genetics Graduate Program, NCSU, 2019 – 2022.
- Graduate school representative and graduate student committee for Quibria Guthrie in Department of Chemistry, September 2018 – April 2021.
- Departmental representative for the Genetics and Genomics Scholars Recruitment

Program, February 18, 2021.

- Lead organizer for the NCSU INTRINSyC weekly seminar series. July 2019 – June 2020.
- Faculty host for BIT 495 Professional Development Student Mock Job Interview, NCSU, April 2019.

College Service:

- Member, Plant transformation laboratory (PTL) advisory committee, March 2021 – *present*.
- Member, Search committee – Molecular Genetics for Weedy and Invasive Species tenure track assistant professor, June 2022 – *present*;
- Member, Search committee – Director of plant transformation laboratory (PTL), January 2019 – May 2020.
- Member, Plant transformation laboratory restructuring committee, May 2019 – December 2019

Departmental Service:

- Member, Departmental Scholarship committee, September 2023 – *present*.
- Member, Departmental Kilgore Landscape committee, September 2023 – *present*.
- Member, Horticultural Science implementation phase of Strategic Plan Initiatives, 11/2021 – *present*:
 - Initiative #1 “Foster a Globally Recognized Crop Improvement Program”.
 - Initiative #3 “Design Sustainable Resilient Horticultural Food Systems”.
 - Initiative #4 “Grow Excellent Academic Programs”.
 - Initiative #6 “Cultivate International Presence”.
- Member, Graduate admissions committee, January 2019 – June 2022;
- Member, Kilgore Hall Research Space Leadership committee, April 2021 – *August 2022*;
- Undergraduate advisor for Class 2025 and 2026: Mia Barbieri, Amelia Brady, Brady Farlow, Sara Fink, Mia Martinez, Cameron McAteer, Sydney McLennan, Shannon Moore, Banessa Santoyo-Lemus, Haozhe (Jerry) Yu.
- Member, Search committee – Nursery/Landscape tenure track assistant professor, August 2019 – May 2020;
- Horticultural science department peer review of faculty teaching, August 2020 – October 2022 (for 2 faculty members);
- Faculty representative for departmental undergraduate recruitment, Spring 2021 (for 1 high schooler);
- Graduate advisor: Samuel Acheampong (Committee), Felicia Shepard (Committee), James Duduit (Chair), Sihui Ni (co-Chair), Davis Harmon (co-Chair), Meghan Roche (co-Chair), Emily Brooks (Chair), Anna Nelson (Chair);
- Faculty host, Horticultural science departmental seminar series (for 2 speakers).

Off campus:

- **Editorial positions:**
 - Review Editor, *Plant Cell Reports*, August 2020 – present;
 - Associate Editor, *Plant Cell Reports*, December 2017 – July 2020;
 - Associate Editor, *Ecotoxicology*, March 2014 – February 2019;
 - Editorial Board Member, *Ecotoxicology*, May 2013 – February 2014.
- **American Society of Horticultural Science (ASHS) service and leadership:**
 - Secretary, Chair-elect, and Chair, Plant Biotechnology Professional Interest Group, 2019 – 2022;
 - Secretary, Chair-elect, and Chair, Asian Professional Interest Group, 2020 – 2023;
 - Member, Annual Conference Technical Program Committee, ASHS, 2022 – 2027;
 - Member (2020-2024) and chair (2024-2025), Endowment Fund Committee, ASHS, 2020 – 2025;
 - Member, Plenary (William A. "Tex" Frazier) & Invited Speakers Selection Committee, ASHS, 2021 – 2026;
 - Judge, ASHS Early Career Competition, August 2, 2022;
 - Moderator, Plant Biotechnology Interest Group workshop, August 1, 2022.
- **Grant Proposal Reviewer and Panelist:**
 - Proposal reviewer for NSF Plant Genome Research Program (PGRP), 2023; 2024;
 - Proposal reviewer and panelist for USDA-NIFA Biotechnology Risk Assessment Research Grants (BRAG) Program, 2024;
 - Proposal reviewer and panelist for USDA-NIFA Specialty Crop Research Initiative (SCRI) Program, 2023; 2024;
 - Proposal reviewer and panelist for the Institute of Cannabis Research Program, 2024;
 - Proposal reviewer and panelist for USDA-NIFA Small Business Innovation Research (SBIR) Program, 2022, 2023;
 - Proposal reviewer and panelist for USDA-ARS NP 301 Panel 5B. Berries Panel, 2022;
 - Proposal reviewer for Institute of Cannabis Research Competition program, 2024;
 - Proposal reviewer for the Department of Biotechnology, Ministry of Science & Technology, India, 2023;
 - Proposal reviewer for Foundation for Food & Agriculture Research (FFAR) Program, 2021, 2023, 2024;
 - Proposal reviewer for University of Maryland Industrial Partnerships (MIPS) Program, 2019.
- Member of the International Organizing Committee & Session Chair, the 4th International Conference of Plant Transformation & Biotechnology, Vienna, Austria, June 29-30, 2017.
- Invited manuscript peer reviewer (>100 times in total) for: *Nature Plants*; *Plant*

Journal; Plant Biotechnology Journal; Horticultural Research; BMC Genomics; PLoS ONE; Planta; Plant Molecular Biology; Plant Cell Tissue and Organ Culture; Plant Cell Reports; Molecular Biology Reports; Ecotoxicology; BMC Biotechnology; Basic and Applied Ecology; Environmental and Experimental Botany; Biologia Plantarum; Environmental Management; Plant Breeding; Environmental Engineering Science; Entomological Science; Botanical Studies; Journal of Crop Science.

INTERNET-BASED RESEARCH DISSEMINATION

Departmental news about my program:

- <https://cals.ncsu.edu/horticultural-science/news/wusheng-liu-ashes-early-career-award/>
- <https://cals.ncsu.edu/horticultural-science/news/measuring-and-translating-success/>

Departmental news about my personnel:

- <https://cals.ncsu.edu/horticultural-science/news/james-duduit-transforming-tomatoes-with-molecular-biotechnology/>

News about the lipofection method I developed for gene editing in a non-GMO manner:

- <https://cals.ncsu.edu/news/crispr-plants-new-non-gmo-method-to-edit-plants/>
- <https://cals.ncsu.edu/horticultural-science/news/crispr-plants-new-non-gmo-method-to-edit-plants/>
- https://f1000.com/prime/thefaculty/member/1018014/contact?utm_medium=email&utm_source=prime_ypp
- <https://newatlas.com/biology/crispr-edits-crops-gmos/>
- <https://geneticliteracyproject.org/2020/05/13/non-gmo-gene-editing-new-technique-edits-plant-dna-without-use-of-foreign-bacterial-genes/>
- <https://www.biotechnika.org/2020/05/non-gmo-crispr-method-to-alter-genome-not-inserting-foreign-dna/>
- <https://www.smartbrief.com/branded/D4C8EBAD-9C67-4D55-869C-CC2C8F893F9E/FA799481-7010-4EAB-989D-451A9CAD080E>
- <http://naukawpolsce.pap.pl/aktualnosci/news%2C82254%2Czrobili-rosliny-gmo-ktore-nie-sa-gmo.html>
- <https://www.chilebio.cl/2020/05/15/nueva-tecnica-para-editar-geneticamente-cultivos-sin-usar-genes-bacterianos/>
- <https://picosico.org/tag/crispr>
- <https://www.immortalitymedicine.tv/category/human-genetic-engineering/>

INVITED NATIONAL PRESENTATIONS (Total = 28; NCSU = 19)

1. **Liu, W.** Translational Genomics Research for Specialty Crop. **NCSU INTRINSyC seminar series**, September 1, 2023.
2. **Liu, W.** Translational Genomics Research for Specialty Crop. **NCSU Horticultural Science Departmental Seminar series**, August 21, 2023.
3. **Liu, W.** A Translational Genomics Approach for Specialty Crop Studies. **NC State Plant & Microbial Departmental Seminar Series**, Raleigh, NC, November 15, 2022.

4. Ranney, T., **Liu, W.**, Da, K. Updates on Ornamental Transformation and Transgene-Free Delivery Strategies. **USDA-ARS FNRI-NCSU Meeting**, November 07, 2022 (virtual).
 5. Huang, D., Maren, N., Duduit, J., Ranney, T., **Liu, W.** Toward non-GMO Gene-Editing in Plants. **Texas A&M Genome Editing Symposium - Current Advances and Technology in Genome Editing**, College Station, TX, October 13, 2022.
 6. **Liu, W.** Translational Genomics for Specialty Crop Trait Improvement. **University of Florida Horticultural Science Departmental Seminar Series** (virtual), October 4, 2021.
 7. **Liu, W.** Toward Transgene-free Plant Gene Editing. **The 38th Annual Conference of the Mid-Atlantic Plant Molecular Biology Society (MAPMBS) Meeting** (virtual). August 16, 2021.
 8. **Liu, W.** Building an Integrated Research and Education Program in Translational Genomics for Specialty Crop Improvement. **ASHS Annual Conference**, Denver, CO. August 05-09, 2021.
 9. **Liu, W.** Cleistogamy Engineering in Camelina for Bioconfinement. **ASHS Annual Conference**, Denver, CO. August 05-09, 2021.
 10. **Liu, W.** Translational Genomics for Vegetable Crop Improvement. **H.M. Clause** (virtual), February 22, 2021.
 11. **Liu, W.** Translational genomics for crop trait improvement. **NCUS Horticultural Science Departmental seminar series**, September 08, 2020.
 12. **Liu, W.** Translational genomics for crop trait improvement. **NC Plant Molecular Biology Retreat**, Wrightsville Beach, NC. September 13-15, 2019.
 13. **Liu, W.** Lipofection-mediated DNA-free delivery of the Cas9/gRNA ribonucleoproteins into plant cells for genome editing. **ASHS Annual Conference**, Las Vegas, July 21-25, 2019.
 14. **Liu, W.** The beauty of plant biotechnology. **NCSU Horticultural Science Summer Institute (HSSI)**, Raleigh, July 10, 2019.
 15. **Liu, W.** Bioconfinement of *Camelina sativa* as a Sustainable Oilseed Crop via Cleistogamy. **USDA BRAG PD meeting**, DC, June 06, 2019.
 16. **Liu, W.** Genome editing of nursery and floriculture crops. **USDA FNRI Plant Breeding conference**, Mills River, May 06, 2019.
 17. **Liu, W.** Development of enabling tools for crop trait improvement. **NCSU Genetics seminar series**, April 15, 2019.
 18. **Liu, W.** Plant Synthetic Biology and Translational Genomics. **NCSU INTRINSyC seminar series**, January 26, 2018.
 19. **Liu, W.** Synthetic promoters and transcription factors for targeted transgene activation in plants. **Plant & Animal Genomes (PAG) XXVI**, San Diego, CA. January 13-17, 2018.
- PRIOR TO NCSU* -----
20. **Liu, W.** The *Arabidopsis thaliana* MYB transcription factor ETC2 confers higher yield and seed size in transgenic soybean (*Glycine max*). **The 28th International Conference of Arabidopsis Research (ICAR)**, St. Louis, MO. June 19-23, 2017.

21. **Liu, W.** Synthetic promoters for targeted transgene activation in plants. **The 4th International Conference of Plant Transformation & Biotechnology**, Vienna, Austria. June 29-30, 2017.
22. **Liu, W.** A plant synthetic biology approach for regulation of transgene expression and precision genome editing. **Department of Horticultural Science seminar series**, North Carolina State University, January 13, 2017.
23. **Liu, W.** Plant Synthetic Biology. **Department of Agricultural and Environmental Sciences seminar series**, Tennessee State University. June 29, 2016.
24. **Liu, W.** Synthetic promoters and transcription factors for the regulation of transgene expression in plants. **Plant Research Center seminar series**, University of Tennessee. October 29, 2015.
25. **Liu, W.** A Plant synthetic biology approach for targeted transgene activation and precision genome editing. **Department of Plant Sciences seminar series**, University of Tennessee. August 31, 2015.
26. **Liu, W.** Synthetic Promoters for Targeted Transgene Activation in Plants. **2014 World Forum on Biology – Joint Meeting of the Society of In Vitro Biology and the Society of Cryobiology**, Savannah, Georgia. June 4, 2014.
27. **Liu, W.** Transcription Factor-Assisted Targeted Transgene Activation in Plants. **Department of Plant Sciences seminar series**, University of Tennessee. March 31, 2014.
28. **Liu, W.** TALE transcription factors-mediated gene expression. **Department of Plant Sciences seminar series**, University of Tennessee. March 05, 2012.

INVITED INTERNATIONAL PRESENTATIONS (Total = 9; NCSU = 6)

1. **Liu, W.** Translational Genomics Research in Specialty Crops. **2023 International Conference on the Cooperation and Integration of Industry, Education, Research and Application** (virtual), Shandong Agricultural University, TaiAn, Shangdong, China, December 19-19, 2023.
2. Huang, D., Kosentka, P., Duduit, J., Maren, N., Ranney, T., **Liu, W.** Non-GMO Gene Editing. **Crop Biotechnology, Physiology and Translational Genomics Symposium, 2021 ASA-CSSA-SSSA International Annual Meeting – A Creative Economy for Sustainable Development** (virtual), Salt Lake City, November 7-10, 2021.
3. **Liu, W.** An Optimized Protocol for Stepwise Optimization of Real-time RT-PCR Analysis. **Horticultural Research Journal Author Meeting series** (virtual), September 14, 2021.
4. **Liu, W.** Coordinated Transcriptional Regulation of the Carotenoid Biosynthesis Pathway Genes Contributes to Fruit Lycopene Content in High-Lycopene Tomato Cultigens. **The 8th International Horticultural Research Conference** (virtual), Nanjing, China, July 20-22, 2021.
5. **Liu, W.** Lipofection-mediated DNA-free delivery of the Cas9/gRNA ribonucleoproteins into plant cells for genome editing. **ASHS Annual Conference**, Las Vegas, July 21-25, 2019.
6. **Liu, W.** Synthetic promoters and transcription factors for targeted transgene activation in plants. **Plant & Animal Genome (PAG) XXVI**, San Diego, CA. January 13-17, 2018.

PRIOR TO NCSU -----

7. **Liu, W.** The *Arabidopsis thaliana* MYB transcription factor ETC2 confers higher yield and seed size in transgenic soybean (*Glycine max*). **The 28th International Conference of Arabidopsis Research (ICAR)**, St. Louis, MO. June 19-23, 2017.
8. **Liu, W.** Synthetic promoters for targeted transgene activation in plants. **The 4th International Conference of Plant Transformation & Biotechnology**, Vienna, Austria. June 29-30, 2017.
9. **Liu, W.** Synthetic Promoters for Targeted Transgene Activation in Plants. **2014 World Forum on Biology – Joint Meeting of the Society of In Vitro Biology and the Society of Cryobiology**, Savannah, Georgia. June 4, 2014.

CONTRIBUTED PRESENTATIONS (Total = 21; NCSU = 8)

1. Da, K., Leng, H., Hermon, D., Nelson, A., Mare, N., **Liu, W.**, Ranney, T. Somatic embryogenesis in cells suspension cultures of rose. ASHS Annual Conference, Chicago, IL. July 30 – August 3, 2022 (**Invited speaker:** Da, K.).
2. Da, K., Leng, H., **Liu, W.**, Yencho, G.C. Somatic embryogenesis in cells suspension cultures of sweetpotato (*Ipomoea batatas*). In Vitro Cellular & Developmental Biology, San Diego, CA. June 4-7, 2022 (**Invited speaker:** Da, K.).
3. Da, K., Leng, H., Hermon, D., Nelson, A., Mare, N., **Liu, W.**, Ranney, T. *Agrobacterium*-mediated genetic transformation of rose embryogenic cell suspension cultures. In Vitro Cellular & Developmental Biology, San Diego, CA. June 4-7, 2022 (**Invited speaker:** Da, K.).
4. Da, K., Shepard, F., Almeyda, C., Pecota, K., **Liu, W.**, Yencho, G.C. (2021) Leaf Culture and Regeneration in Elite Sweetpotato (*Ipomoea batatas* L.) Genotypes. **Society of In Vitro Biology (SIVB) Annual Meeting**, June 5-9, 2021.
5. Huang, D., **Liu, W.** Engineered Cleistogamy for Bioconfinement in Camelina. **NCSU Plant Breeding Consortium Retreat Lightning Talks**, Raleigh, NC. April 27, 2022 (**Invited speaker:** Huang, D.).
6. Huang, D., **Liu, W.** Engineered Cleistogamy for Bioconfinement in Camelina. **NCSU INTRINSyC seminar series**, November 12, 2021 (**Invited speaker:** Huang, D.; virtual).
7. Duduit, J., **Liu, W.** Coordinated Transcriptional Regulation of the Carotenoid Biosynthesis Pathway Genes Contributes to Fruit Lycopene Content in High-Lycopene Tomato Cultigens. **NCSU Plant Breeding Retreat Lightning Talks**, Raleigh, NC. October 22, 2021 (**Invited speaker:** Duduit, J.).
8. Da, K., Shepard, F., Almeyda, C., Pecota, K., **Liu, W.**, Yencho, G. C. 2021. Leaf culture and regeneration in elite sweetpotato (*Ipomoea batatas* L.) genotypes. In vitro cellular & developmental biology. June 5-9, 2021 (**Invited speaker:** Da, K.; virtual)

PRIOR TO NCSU -----

9. Ondzighi-Assoume, C.A., Wills, J.D., Taheri, A., Allen, S.M., King, Z., Parrott, W.A., **Liu, W.**, Burris, J.N., Lenaghan, S.C., Stewart, C.N., Jr. Development of efficient and reproducible *Agrobacterium*-mediated transformation and regeneration systems for highly embryogenic cell suspension cultures in switchgrass (*Panicum virgatum* L.).

- American Society of Plant Biology (ASPB)**, Honolulu, Hawaii, USA. June 23-28, 2017
(Invited speaker: Ondzighi-Assoume, C.A.)
10. Liu, W., Stewart, C.N., Jr. The design of synthetic promoters and transcription factors. **2cd Cereal Engineering Consortium Workshop**. Boston, MA. June 8-9, 2015. (Invited speaker: Stewart, C.N., Jr.)
 11. Lenaghan, S., Stewart, C.N., Jr., Liu, W., Dhillon, T. Single cell testing systems in cereals. **2cd Cereal Engineering Consortium Workshop**. Boston, MA. June 8-9, 2015. (Invited speaker: Lenaghan, S.)
 12. Liu, W., Schmidt, D.A., Millwood, R.J., Rudis, M.R., Mazarei, M., Chesnut, J.D., Potter, C.J., Stewart, C.N., Jr. Synthetic promoters and transcription factors for precise gene expression in plants. **Synthetic Biology Congress**, London, UK. October 21, 2014. (Invited speaker: Stewart, C.N., Jr.)
 13. Liu, W., Willis, J., Peng, Y., Millwood, R.J., Sang, Y., Mazarei, M., Stewart, C.N., Jr. Plant synthetic biology tools to transform bioenergy feedstocks. **The 36th Symposium on Biotechnology for Fuels and Chemicals**. To be given on April 28-May 1, 2014. (Invited speaker: Stewart, C.N., Jr.)
 14. Stewart, C.N., Jr., Liu, W., Rudis, M.R., Peng, Y., Mazarei, M., Millwood, R.J., Yang, J.-P., Chesnut, J.D. Synthetic TAL effectors for targeted gene activation in plants. **2013 In Vitro Biology Meeting**, Providence, Rhode Island, June 15-19, 2013. (Invited speaker: Stewart, C.N., Jr.)
 15. Stewart, C.N., Jr., Liu, W., Chestnut, J.D. Synthetic TAL effectors for targeted gene activation in plants. **Plant Sciences Webinars, Life Technologies**, March 28, 2013. (Invited speaker: Stewart, C.N., Jr.)
 16. Stewart, C.N., Jr., Liu, W., Chestnut, J.D. Enhancing plant transgene expression with TAL effectors. **Life Technologies Workshop, Plant & Animal Genomes XXI Conference**, January 12-16, 2013. San Diego, CA. (Invited speaker: Stewart, C.N., Jr.)
 17. Stewart, C.N., Jr., Mazarei, M., Liu, W., Rao, M.R., Rudis, M.R., Abercrombie, L.G., Mann, D.G.J., Peng, Y., Balasubramaniam, M. Phytosensors: plants to report pathogens and environmental contaminants. **Plant & Animal Genomes XIX Conference**, January 15-19, 2011, San Diego, CA. (Invited speaker: Balasubramaniam, M.)
 18. Stewart, C.N., Jr., Mazarei, M., Liu, W., Rao, M., Rudis, M.R., Abercrombie, L., Mann, D.G.J., Sykes, V. Phytosensors: plants to report plant pathogens and environmental contaminants. **12th International Association for Plant Biotechnology Congress (IAPB) and the 2010 In vitro Biology Meeting of the Society for In Vitro Biology (SIVB)**, June 6-11, 2010, St. Louis, Abstract S332. (Invited speaker: Stewart, C.N., Jr.)
 19. Liu, W., Willet, S., Wilson, R., Shpak, E.D. *ERECTA* splicing leads to an increase in gene expression at the posttranscriptional level. **American Society of Plant Biology Annual Meeting**, June 22-25, 2008, Mérida, Mexico. (Invited speaker: Shpak, E.D.; Poster)
 20. Shaw, J., Lickey, E., Beck, J., Farmer, S., Liu, W., Miller, J., Siripun, K.C., Winder, C., Shilling, E., Small, R. The tortoise and the hare II: relative utility of 21 noncoding chloroplast DNA sequences for phylogenetic analysis. **Botany 2004 Meeting**, July 31-August 5, 2004. Snowbird, UT. (Invited speaker: Shaw, J.)

21. Shaw, J., Lickey, E., Beck, J., Farmer, S., **Liu, W.**, Miller, J., Siripun, K.C., Winder, C., Shilling, E., Small, R. Phylogenetic utility of fifteen noncoding cpDNA regions among major lineages of seed plants. **Botany 2003 Meeting**, July 26-31, 2003. Mobile, AL. (Invited speaker: Shaw, J.)

POSTERS (Total = 16; NCSU = 6)

1. Huang, D., Brooks, E.G., Maren, N.A., Ferreira, F., Zhang, S., **Liu, W.** (2024) Novel short synthetic promoters for constitutive expression in dicot species. **Plant & Animal Genomes Conference (PAG31)**, January 12-17, 2024, San Diego, CA.
2. Duduit, J., Adhikari, T., Louws, F., **Liu, W.** (2024) Functional characterization of a candidate bacterial wilt resistance gene in tomato. **Plant & Animal Genomes Conference (PAG31)**, January 12-17, 2024, San Diego, CA.
3. Da, K., Shepard, F., Almeyda, C., Pecota, K., **Liu, W.**, Yencho, G.C. (2021) Leaf culture and regeneration in elite sweetpotato (*Ipomoea batatas* L.) genotypes. **Society of In Vitro Biology (SIVB) Annual Meeting**, June 5-9, 2021.
4. Harmon, D., Touchell, D., Da, K., **Liu, W.**, Ranney, T. (2021) Embryogenic callus induction of *Rosa hybrid*. **Society of In Vitro Biology (SIVB) Annual Meeting**, June 5-9, 2021.
5. Duduit, J.R., Kosentka, P.Z., Miller, M.A., Blanco-Ulate, B., Lenucci, M.S., Panthee, D.R., Perkins-Veazie, P., **Liu, W.** (2020) Coordinated transcriptional regulation of the carotenoid biosynthesis pathway genes contributes to fruit lycopene content in high-lycopene tomatoes. **SOL International Online Meeting**, November 9-11, 2020.
6. Duduit, J.R., Kosentka, P.Z., Panthee, D.R., Perkins-Veazie, P., **Liu, W.** Identification of the key carotenoid biosynthesis pathway genes impacting tomato fruit lycopene Content. **National Association of Plant Breeders (NABP)**, Pine Mountain, GA. August 25-29, 2019.

PRIOR TO NCSU -----

7. **Liu, W.**, Mazarei, M., Ye, R., Peng, Y., Shao, Y., Baxter, H.L., Wang, Z.-Y., Stewart, C.N., Jr. Switchgrass (*Panicum virgatum* L.) green tissue-specific promoters: identification, functional characterization and application. **DOE-BESC Retreat**, Chattanooga, TN. July 10-13, 2017.
8. **Liu, W.**, Schmidt, D.A., Millwood, R.J., Cheplick, M.H., Rudis, M.R., Mazarei, M., Potter, C.J., Stewart, C.N., Jr. The QF/QS binary expression system for regulation of targeted transgene expression in plants. **Synthetic Biology Congress**, London, UK. October 20-21, 2015.
9. **Liu, W.**, Schmidt, D.A., Millwood, R.J., Cheplick, M.H., Rudis, M.R., Mazarei, M., Chesnut, J.D., Potter, C.J., Stewart, C.N., Jr. The QF/QS binary expression system for regulation of targeted transgene expression in Plants. **Plant & Animal Genomes XXIII Conference**, January 10-14, 2015, San Diego, CA.
10. Lenaghan, S., N. Labbe, K. Burris, **W. Liu**, J. D. Willis, L. M. Kline, G. Pigna, A. G. Collins, J. Grant, M. R. Rudis, S. Allen, and C. N. Stewart, Jr.. High throughput transformable switchgrass culture system. **ARPA-E Petro Program Industry Meeting**. Research Triangle Park, NC. September 15-16, 2014.

11. **Liu, W.**, Mazarei, M., Fethe, M.H., Lin, J., Arelli, P.R., Pantalone, V.R., Stewart, C.N., Jr. From bioinformatics to experimental biology: looking for *de novo* inducible motifs in soybean genome during a compatible interaction between soybean and soybean cyst nematode. **Plant & Animal Genomes XX Conference**, January 14-18, 2012, San Diego, CA.
12. **Liu, W.**, Rao, M.R., Mazarei, M., Stewart, C.N., Jr., *De novo* motif discovery from soybean cyst nematode-induced genes in soybean. **Southern Section American Society of Plant Biology Annual Meeting**, April 10-12, 2010, Knoxville, TN.
13. **Liu, W.**, Rudis, M.R., Sykes, V.R., Mazarei, M., Stewart, C.N., Jr. *In vivo* analysis of synthetic promoters by agroinfiltration of tobacco leaves for pathogen Phytosensing. **Southern Section American Society of Plant Biology Annual Meeting**, April 10-12, 2010, Knoxville, TN.
14. Mazarei, M., Al-Ahmad, H., **Liu, W.**, Arelli, P.R., Pantalone, V.R., Stewart, C.N., Jr. Gene expression profiling of a resistant and a susceptible soybean challenged with soybean cyst nematode. **World Soybean Research Conference VIII**, August 10-15, 2009, Beijing, China.
15. Wilson, R., **Liu, W.**, Willet, S., Shpak, E.D. ERECTA mRNA splicing leads to an increase in the gene expression at the posttranscriptional level. **China-US Workshop on Biotechnology of Bioenergy Plants**, Nov. 16-17, 2009, Knoxville, TN.
16. **Liu, W.**, Willet, S., Wilson, R., Shpak, E.D. ERECTA splicing leads to an increase in gene expression at the posttranscriptional level. **American Society of Plant Biology Annual Meeting**, June 22-25, 2008, Mérida, Mexico.