Heather J. Gladfelter

Department of Horticulture
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University of Georgia
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Education and Training:

University of Georgia – (2013- 2019); PhD in Horticulture

The Chicago School of Professional Psychology – (2007-2010); Organizational Behavior

University of Phoenix – (2005-2007); MBA with specialization in Technology Management

North Carolina State University – (1987- 1996); Post-graduate study in Plant Genetics

New Mexico State University – (1980- 1987); BS & MS in Horticulture

Professional Experience:

University of Georgia –Athens, GA (2012-present) Research Professional II

- Performed molecular genetic transformations on American chestnut, white and green ash, flowering dogwood, and Gala apple species using tissue culture methods for the purpose of identifying genes potentially able to confer resistance to devastating fungal blight, root rot diseases, and to be able to use CRISPER-CAS9 gene editing to confer powdery mildew resistance and alteration of genes involved in the cell cycle.
- Transformation of binary plasmids into *Agrobacterium* strain EH105 with GFP and NPTII and determining presence using restriction digestion and gel electrophoresis.
- Identified expression of the reporter gene GUS by histochemical analysis and GFP activity using fluorescent microscopy.
- Assisted in embryo conversion, shoot multiplication, *in vitro* rooting of shoots, transfer of plantlets to soil, and acclimation of plants to greenhouse.
- Isolated genomic DNA for genotype-by-sequencing (GBS) genetic diversity analysis of *Franklinia alatamaha* using plant DNA extraction kits assessing quality and quantity of DNA on Nanodrop and Qubit by spectrophotometry. Assisted in the bioinformatics analysis of the GBS sequence data.

ArborGen, LLC – Summerville, SC (2002-2010) Research Associate Project Manager

- Managed several research projects to develop high through-put systems for production of genetically-enhanced eucalyptus and pine trees and products for commercialization.
- Developed an *Agrobacterium* transformation system for loblolly pine and radiata pine to insert genes for wood quality, lignin reduction, and faster growth for shorter rotation of wood harvests.
- Conducted *Agrobacterium* transformations of eucalyptus with genes for early flowering and inducing sterility.
- Cloned genes in binary vectors for Agrobacterium transformation. Involved identification using PCR, restriction digests, and gel electrophoresis.

- Performed PCR on putative transformed tissue to identify the presence of transgenes.
- Identified expression of the reporter gene GUS by histochemical analysis and GFP activity using fluorescent microscopy.

***MeadWestvaco* –** Summerville, SC (1998-2002) Project Assistant

- Responsible for research and development of genetic methods and biotechnology systems designed to produce genetically-enhanced tree species for commercialization.

***Syngenta* –** Research Triangle Park, NC (1997-1998) Environmental Specialist

- Created gene knockouts to study gene function of key genetic pathways for targeting potential fungicides as part of a fungal genomics project.
- Cloning, PCR, and molecular characterization of genes in the fungal species *Ashbya gossypii* to study the growth of fungal cells.
- Isolated and cloned squalene synthetase from a fungus to be used as enzymatic target in cholesterol drug discovery project.

***North Carolina State University* –**Raleigh, NC (1990-1997) Lab Research Manager

- Cloning and molecular characterization of sequences and proteins involved in DNA replication of plant Geminivirus Tomato Golden Mosaic Virus (TGMV).
- Used techniques such as P^{32} and S^{35} Sanger sequencing, Southern blotting, northern blotting, western protein assays, PCR, and gel electrophoresis.
- Developed a plant protoplast system used for testing and characterizing molecular engineered TGMV mutants via transient bioluminescence assays or DNA hybridization assays.

Honors:

- Philip R. White Plant Tissue Culture Award – Society for In Vitro Biology (1986)
- Jeane Reeves Research Grant Award (2011, 2013, 2018)
- Marie Mellinger Field Grant Award (2012)
- President's Research Grant Award – Brenau University (2012)
- Bartram Trail Conference Fothergill Award (2018)
- Charlie Parkerson Graduate Student Research Paper Competition (2019)- 4th place
- Stanley Smith Horticultural Trust Grants (2020)- funded $20,000

Memberships:

- American Association of University Women (AAUW)
- American Society of Horticultural Science (ASHS)
- Georgia Botanical Society (GBS)
- Georgia Plant Conservation Alliance (GPCA)

- Georgia Native Plant Society (GNPS)
- Phi Kappa Phi

Selected Publications:

1. Gladfelter, H.J., Yadav, L.K., Merkle, S.A., and Wilde, H.D. Genetic diversity and population structure analysis of *Franklinia alatamaha*, a tree species existing only in cultivation. *Tree Genetics & Genomes* (in press).
2. Gladfelter, H.J., Johnston, J., Wilde, H.D., and Merkle, S.A. 2020. Adventitious shoot propagation of *Franklinia alatamaha* for commercial horticulture and restoration. *In vitro cellular & Developmental Biology-Plant*, https://doi.org/10.1007/s11627-020-10087-8
3. Gladfelter, H.J., Johnston, J., Wilde, H.D., and Merkle, S.A. 2020. Somatic embryogenesis and cryopreservation of *Stewartia* species. *Plant Cell, Tissue and Organ Culture (PCTOC)*, https://doi.org/10/1007/s11240-020-01834-1
4. Gladfelter, H.J. 2019. Enhancing the ornamental potential of rare Theaceae species through genetic diversity and tissue culture research. PhD Dissertation. University of Georgia.
5. Gladfelter, H.J. and Wilde, H.D. 2019. Development of embryogenic dogwood cultures and the regeneration of plants. *Plant Biotechnology, 36*: 53-56.
6. Merkle, S.A., M. G. MacKnight, H.J. Gladfelter and S.N. Jeffers. 2019. Development of an *in vitro* screen for *Phytophthora cinnamomi* resistance in hybrid and transgenic chestnut trees. In: Bonga JM, Park YS, Trontin JF (Editors) Proceedings of the 5th International Conference of the IUFRO Unit 2.09.02 on "Clonal Trees in the Bioeconomy Age: Opportunities and Challenges." September 10-15, 2018. Coimbra, Portugal, p. 257 [abstract].
7. Merkle, S.A., A.R. Tull, H.J. Gladfelter, P.M. Montello, J.E. Mitchell, C. Ahn and R.D. McNeill. 2017. Somatic embryogenesis and cryostorage for conservation and restoration of threatened forest trees. In: Sniezko, R. A., Man, G., Hipkins, V., Woeste, K., Gwaze, D., Kliejunas, J.T. and McTeague, B.A., tech. cords. Proceedings of Workshop on Gene Conservation of Tree Species–Banking on the Future. Gen. Tech. Rep. PNW-GTR-963. Portland, OR. USDA Forest Service, Pacific Northwest Research Station, pp. 113-116.
8. Merkle, S.A., C. Ahn, A.R. Tull, P. M. Montello, J.E. Dassow and H.J. Gladfelter. 2017. Integration of selection, breeding, somatic embryogenesis and cryostorage to conserve and restore threatened North American forest trees. In: Proceedings of the Fourth International Conference of the IUFRO Working Party 2.09.02, Development and application of vegetative propagation technologies in plantation forestry to cope with a changing climate and environment. September 19-23, 2016, La Plata, Argentina, pp. 245-248.
9. Orozco, B.M., Gladfelter, H.J., Settlage, S.B., Eagle, P.A., Gentry, R.N., Hanley-Bowdoin, L. (1998). Multiple cis elements contribute to geminivirus origin function. *Virology, 242*(2): 346-356
10. Gladfelter, H.J., Eagle, P.A., Fontes, E.P.B., Batts, L., Hanley-Bowdoin, L. (1997). Two domains of the AL1 protein mediate geminivirus origin recognition. *Virology, 239*(1): 186-197.

11. Fontes, E.P.B., Gladfelter, H.J., Schaffer, R.L., Petty, I.T.D., Hanley-Bowdoin, L (1994). Geminivirus replication origins have a modular organization. *Plant Cell, 6*(3): 405-416.
12. Phillips, G.C.; Gladfelter, H.J. (1991). Eldarica pine, afghan pine (*Pinus eldarica Medw*.). *Biotechnol Agric-For.,16*: 269-287.
13. Wagley, L.M., Gladfelter, H.J., Phillips, G.C. (1987). *De novo* shoot organogenesis of *Pinus eldarica* Medw. *in vitro*. II. Macro- and micro-photographic evidence of *de novo* regeneration. *Plant Cell Rep, 6*(3): 167-171.
14. Gladfelter, H.J., Phillips, G.C. (1987). *De novo* shoot organogenesis of *Pinus eldarica* Medw. *in vitro*. I. Reproducible regeneration from long-term callus cultures. *Plant Cell Rep., 6*(3):163-166.

Patents

Enhanced transformation and regeneration of transformed embryogenic pine tissue. United States Patent No. 7,157,620. Issue Date: January 2, 2007. Inventors: Marie B. Connett-Porceddu, Heather J. Gladfelter, Jon E. Gulledge, and Ryan R. McCormack. Assignee: ArborGen Inc.