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RESEARCH INTERESTS

Plant molecular physiologist experienced in biochemistry, specifically the application of mass spectrometry to research problems in genomics, bioenergy crop production, environmental stress physiology, and plant-microbe signaling. Current research includes metabolomics for phenotypic characterization of genetically modified *Populus, Arabidopsis*, *Eucalyptus*, *Castanea*, switchgrass, and numerous bioenergy-relevant microbial species. Research targets include the application of genomic tools for the accelerated domestication of *Populus* to increase drought tolerance and biomass productivity on marginal sites, and to manipulate bioproduct formation. Recent activities include characterizing the molecular basis of plant-microbe (bacterial and fungal) symbiotic relationships in contrast with pathogenic relationships, and natural product isolation and identification.

POSITIONS

2020-present	**Section Head Systems Biology, Distinguished R&D Staff** Biosciences Division, Oak Ridge National Laboratory, Oak Ridge, TN
2007-2020	**Group Leader Metabolomics**, **Distinguished R&D Staff** Biosciences Division, Oak Ridge National Laboratory, Oak Ridge, TN
2004-present	**Joint Faculty ORNL Graduate Advisor** for the Bredesen Center for Interdisciplinary Research and Graduate Education, and the UT-ORNL Genome Science & Technology Graduate School, University of Tennessee, Knoxville
2002-2006	**Senior Scientist**, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN
1995-1997	**Adjunct Professor**, Institute of Agriculture, Univ. of Tennessee, Knoxville, TN
1990-2002	**Research Staff**, Environmental Sciences Division, ORNL, Oak Ridge, TN
1989-1990	**ASG Postdoctoral Research Associate**, Environmental Sciences Division Oak Ridge National Laboratory, Oak Ridge, TN
1987-1989	**ORAU Postdoctoral Research Associate**, Environmental Sciences Division Oak Ridge National Laboratory, Oak Ridge, TN
1986	**Lecturer**, Tree Physiology, University of Toronto, Toronto, Canada

EDUCATION

1982-87	**Ph.D. Forestry** - University of Toronto, Toronto, Ontario, Canada
1980-82	**M.Sc. Forestry** - University of Toronto, Toronto, Ontario, Canada
1976-80	**B.Sc. Biology** - Carleton University, Ottawa, Ontario, Canada

PUBLICATIONS – 240 total (including 3 patents)

M.C. Klein, C.Y.S. Wong, J.G. Monroe, J. Bailey-Bale, T.N. Buckley, J.-G. Chen, M. Shu, T.J. Tschaplinski, G.A. Tuskan, T.S. Magney, and G. Taylor. 2026. Unraveling plant phenotype to genotype associations with daily hyperspectral traits in *Populus trichocarpa*. Plant Phenomics 8:(2) 100174 https://doi.org/10.1016/j.plaphe.2026.100174

Tuskan, G.A., S.D. Wullschleger, P.J. Hanson, M.A. Cregger, J.L. Field, B.P. Sloan, M.W. Cunningham, B.M. Cregg, J.L. Rakestraw, and T.J. Tschaplinski. 2026. Overcoming environmental constraints to high-yielding eastern cottonwood productivity in the southeastern United States. Annals of Applied Biology: First published online: 25 March 2026 https://doi.org/10.1111/aab.70113

J.W. Westbrook, J. Malukiewicz, Q. Zhang, A. Sreedasyam, J.W. Jenkins, V. Lakoba, S. Fitzsimmons, J. Van Clief, K. Collins, S. Hoy, C. Stark, L. Graboski, E. Jenkins, T.M. Saielli, B.T. Jarrett, L.J. Wigfield, L.M. Kerwien, C. Wilbur, A.M. Sandercock, J.H. Craddock, S. Keriö, T. Zhebentyayeva, S. Fan, A.M. Thomas, A.G. Abbott, C.D. Nelson, X. Xia, J.R. McKenna, C. Kell, M. Williams, L. Boston, C. Plott, F. Carle, J. Swatt, J. Ostroff, S.N. Jeffers, K. McKeever, E. Smith, T.J. Ellis, J.B. James, P. Sisco, A. Newhouse, E. Carlson, W.A. Powell, F.V. Hebard, J. Scrivani, C. Heverly, M. Cipollini, B. Clark, E. Evans, B. Levine, J.E. Carlson, D. Goodstein, J. Orebaugh, Z.K. Yang, M.Z. Martin, J. Tannous, T.A. Rush, N.L. Engle, T.J. Tschaplinski, J. Grimwood, J. Schmutz, J.A. Holliday, and J.T. Lovell. 2026. Genomic approaches to accelerate American chestnut restoration. Science 391 (6786). https://doi.org/10.1126/science.adw3225

R. Hu, S. Jawdy, A. Sreedasyam, A. Lipzen, M. Wang, V. Ng, C. Daum, K. Keymanesh, D. Liu, A. Hu, A. Pasha, N.J. Provart, A.M. Borland, T.J. Tschaplinski, G.A. Tuskan, J. Schmutz, and X. Yang. 2026. Rhythmic mechanisms governing CAM photosynthesis in *Kalanchoe fedtschenkoi*: High-resolution temporal transcriptomics. Int. J. Mol. Sci. 27(3) 10.3390/ijms27031342. https://doi.org/10.3390/ijms27031342

Biswal A.K., N.N. Hengge, M.A. Atmodjo, P.E. Abraham, N.L. Engle, S.S. Mohanty, I. Black, X. Cheng, D. Ryno, P. Azadi, T.J. Tschaplinski, Y.J. Bomble, and D. Mohnen. 2025. Rhamnogalacturonan I as a key recalcitrant pectin domain in *Clostridium thermocellum*-mediated switchgrass deconstruction. Biotech. for Biofuels and Bioprod. 18:109. https://doi.org/10.1186/s13068-025-02703-9

Liew, F., R. Nogle, T. Abdalla, B.J. Rasor, C. Canter, R.O. Jensen, L. Wang, J. Strutz, P. Chirania, S. De Tissera, A.P. Mueller, Z. Ruan, A. Gao, L. Tran, J.C. Bromley, J. Daniell, R. Conrado, N.L. Engle, T.J. Tschaplinski, R.J. Giannone, R.L. Hettich, A.S. Karim, S.D. Simpson, S.D. Brown, C. Leang, M.C. Jewett, and M. Köepke. 2025. Addendum: Carbon-negative production of acetone and isopropanol by gas fermentation at industrial pilot scale. *Nat Biotechnol* **43**, 1385–1387 (2025). https://doi.org/10.1038/s41587-025-02767-w

Yang, X., J. Tannous, T.A. Rush, I. Del Valle, S. Xiao, B. Maharjan, Y. Liu, D.J. Weston, K. De, T.J. Tschaplinski, J.H. Lee, M. Morgan, D. Jacobson, Md. T. Islam, F. Chen, P.E. Abraham, G.A. Tuskan, M.J. Doktycz, J.-G. Chen. 2025. Utilizing plant synthetic biology to accelerate plant-microbe interactions research. BioDesign Research Vol. 7(2), 2025,100007, ISSN 2693-1257, https://doi.org/10.1016/j.bidere.2025.100007

Yao, T., A. Ortega-Corretjer, X. Zhang, N.L Engle, K.R. Carter, A. Devireddy, J.H. Lee, J.

Weston, D.J. Weston, T.J. Tschaplinski, G.A. Tuskan, M. Li, J.-G. Chen, 2025. Variation in flooding tolerance in *Populus deltoides* 'D-124' and *P. trichocarpa* x *P. deltoides* hybrid '52–225', Tree Physiology, 2025, tpaf098, https://doi.org/10.1093/treephys/tpaf098

Shu, M., A.L. Harfouche, M. Trtílek, K. Panzarová, O.F. Alasia, J.H. Lagergren, A. Labbé, N.L. Engle, M.M. Clark, J.-G. Chen, G.A. Tuskan, and T.J. Tschaplinski. 2025. Leveraging hyperspectral phenotyping for accurate, non-destructive prediction of metabolite profiles in poplar under drought stress. Environmental and Experimental Botany Vol. 237, September 2025, 106218. https://doi-org.ornl.idm.oclc.org/10.1016/j.envexpbot.2025.106218

Klein, M., Z. Meng, J. Bailey-Bale, S. Milner, P. Shi, W. Muchero, J.-G. Chen, T.J. Tschaplinski, D. Jacobson, J. Lagergren, M. Lane, C. O Brien, H. Chhetri, C. Abeyratne, M. Shu, P. Freer-Smith, T. Buckley, T. Magney, G. Monroe, G.A. Tuskan, and G. Taylor. 2025. Climate adaptation in *P. trichocarpa*: key adaptive loci identified for stomata and leaf traits. New Phyt. https://doi.org/10.1111/nph.70343

Appidi, M.R., S. Mudbhari, K. Cope, S. Jawdy, D. Carper, E. Öksüz, X. Wang, T.J. Tschaplinski, M. Wang, R.L. Hettich, U.C. Kalluri, and P. Abraham. 2025. Dynamic rhizodeposition in the woody perennial *Populus trichocarpa*. Plant, Cell and Environ. https://doi.org/10.1111/pce.70004

Maharjan BK, Md. T. Islam, A. Muzaffar, T.J. Tschaplinski, G.A. Tuskan, J.G. Chen, and X. Yang. 2025. Woody plant transformation: Current status, challenges, and future perspectives. Plants (Basel) 14(22):3420. https://doi.org/10.3390/plants14223420

Feyissa, B.A., J.H. Lee, D. Carper, N.L. Engle, T.J. Tschaplinski, P.E. Abraham, D.J. Weston, W. Muchero, G.A. Tuskan, and J.-G. Chen. 2025. Species-specific epigenetic signature associates with heat stress tolerance in the perennial tree species *Populus*. GCB Bioenergy, 2025; 17:e70033 https://doi.org/10.1111/gcbb.70033

Mottiar, Y., T.J. Tschaplinski, J. Ralph, and S.D. Mansfield. 2025. Suppression of chorismate mutase 1 in hybrid poplar reveals partial redundancy in the supply of lignin precursors. Plant Direct March 20259(3). http://doi.org/10.1002/pld3.70053

Groover, A., L. Bogar, C. Brodersen, R. David-Schwartz, J. Gersony, N. Holbrook, A. Polle, J. Pittermann, B. Medlyn, N. McDowell, S. Keller, T. Tschaplinski, R. Spicer, K. Sokołowska, A. Sala, and Y. Preisler. 2025. Tree drought physiology: Critical research questions and strategies for mitigating climate change effects on forests. New Phyt. 245 (5):1817-1832. http://doi.org/10.1111/nph.20326

Christel, S., A.A. Carrell, L.H. Burdick, M.I. Villalobos Solis, P.E. Abraham, S.S. Jawdy, J.E. Chaves, N.L. Engle, T.-K. Berhane, T. Yao, J.-G. Chen, W. Muchero, T.J. Tschaplinski, M.A. Cregger, and J.K. Michener. 2024. Catabolic pathway acquisition by rhizosphere bacteria readily enables growth with a root exudate component but does not affect root colonization. mBio Dec 11:e0301624. https://doi.org/10.1128/mbio.03016-24

Ployet, R., K, Feng, J. Zhang, I. Baxter, D.C. Glasgow, J.-G. Chen, G.A. Tuskan, T.J. Tschaplinski, D.J. Weston, M.Z. Martin, W. Muchero. 2024. Elemental profiling and genome-wide association mapping reveal genomic variants modulating ionomic composition in *Populus trichocarpa* leaves. Front. Plant Sci. 15:1450646. https://doi.org/10.3389/fpls.2024.1450646

Fracchia, F., F. Guinet, N.L. Engle, T.J. Tschaplinski, C. Veneault-Fourrey, and A. Deveau. 2024. Microbial colonisation rewires the composition and content of poplar root exudates, root and shoot metabolomes. Microbiome 12:173. https://doi.org/10.1186/s40168-024-01888-9

Davin, M.K., R.A. Thompson, R.J. Giannone, L.W. Mendelson, D.L. Carper, M.Z. Martin, M.E. Martin, N.L. Engle, T.J. Tschaplinski, S.D. Brown, and R.L. Hettich. 2024. *Clostridium autoethanogenum* alters cofactor synthesis, redox, and lysine-acetylation in response to increasing H_2:CO feedstock ratios for enhancing carbon capture efficiency. Biotech for Biofuels and Bioprod. 17:119. https://doi.org/10.1186/s13068-024-02554-w

Simon, S., A. Furches, H. Chhetri, L. Evans, P. Jones, G. Wimp, D. Macaya-Sanz, D. Jacobson, T. Tschaplinski, G. Tuskan, S.P. DiFazio. 2024. Genetic underpinnings of arthropod community distributions in *Populus trichocarpa*. New Phyt. 242:1307-1323. https://doi.org/10.1111/nph.19660

Chang, E., W. Guo, J. Chen, J. Zhang, Z. Jia, T.J. Tschaplinski, X. Yang, Z. Jiang, and J. Liu. 2023. Chromosome-level genome assembly of *Quercus variabilis* provides insights into the molecular mechanism of cork thickness. Plant Science 337:111874 https://doi.org/10.1016/j.plantsci.2023.111874

Hixson, K.K., A. Dhingra, F. Dini-Andreote, M.J. Doktycz, T.J. Tschaplinski TJ and L. Paša-Tolić. (2023). Editorial: Plant-microbe omics. Front. Anal. Sci. 3:1278170. http://doi:10.3389/frans.2023.1278170

de Freitas Pereira, M., D. Cohen, L. Auer, N. Aubry, M.-B. Bogeat-Triboulot, C. Bure, N. L. Engle, Y. Jolivet, A. Kohler, O. Novák, I. Pavlovic, P. Priault, T. J. Tschaplinski, I. Hummel, M.-N. Vaultier, and C. Veneault-Fourrey. 2023. Ectomycorrhizal symbiosis prepares its host locally and systemically for abiotic cue signaling. The Plant Journal 116:1784-1803. http://doi.org/10.1111/tpj.16465

Bryant, N., N. Engle, T. Tschaplinski, Y. Pu, and A.J. Ragauskas. 2023. Variable lignin structure revealed in *Populus* leaves. RSC Advances 13:20187-20197 https://doi.org/10.1039/D3RA03142J

Yao, T., J. Zhang, T.B. Yates, H.K. Shrestha, N.L. Engle, R. Ployet, C. John, K. Feng, W.P. Bewg, M.S.S. Chen, H. Lu, S.A. Harding, Z. Qiao, S.S. Jawdy, M. Shu, W. Yuan, K. Mozaffari, A.E. Harman-Ware, R.M. Happs, L.M. York, B.M. Binder, Y. Yoshinaga, C. Daum, T.J. Tschaplinski, P.E. Abraham, C.-J. Tsai, K. Barry, A. Lipzen, J. Schmutz, G.A. Tuskan, J.-G. Chen, and W. Muchero. 2023. Expression quantitative trait loci mapping identified PtrXB38 as a key hub gene in adventitious root development in *Populus*. New Phytol. 239:2248-2264. https://doi.org/10.1111/nph.19126

Saint-Vincent, P., A. Furches, S. Galanie, E. Teixeira-Prates, J.L. Aldridge, A. Labbé, N. Zhao, M.Z. Martin, P. Ranjan, P. Jones, D. Kainer, U. Kalluri, J.-G. Chen, W. Muchero, D. Jacobson, and T.J. Tschaplinski. 2023. Validation of a metabolite-GWAS network for *Populus trichocarpa* family 1 UDP-glycosyltransferases. Front. Plant Sci. 14:1210146. https://doi.org/10.3389/fpls.2023.1210146

Bryant, N., W. Muchero, R. Weber, J. Barros, J.-G. Chen, T.J. Tschaplinski, Y. Pu, and A.J. Ragauskas. 2023. Cell wall response of field grown *Populus* to *Septoria* infection. Sec. Plant Pathogen Interactions. Front. Plant Sci. 14:1089011.

https://doi.org/10.3389/fpls.2023.1089011

Bryant, N., J. Zhang, K. Feng, M. Shu, R. Ployet, J.-G. Chen, W. Muchero, C. G. Yoo, T.J. Tschaplinski, Y. Pu, and A.J. Ragauskas. 2023. Novel candidate genes for lignin structure identified through genome-wide association study of naturally varying *Populus trichocarpa*. Front. Plant Sci. 14, Article number 1153113 https://doi.org/10.3389/fpls.2023.1153113

Li, C. W. Huang, X. Han, G. Zhao, W. Zhang, W. He, B. Nie, X. Chen, T. Zhang, W. Bai, X. Zhang, J. He, C. Zhao, A.R. Fernie, T.J. Tschaplinski, X. Yang, S. Yan, and L. Wang. 2023. Diel dynamics of multi-omics in elkhorn fern provides new insights into early CAM evolution. Plant Comm. 4, 100594 https://doi.org/10.1016/j.xplc.2023.100594

Harman-Ware, A.E., M.Z. Martin, N.L. Engle, C. Doeppke, and T.J. Tschaplinski. 2023. Rapid screening of secondary aromatic metabolites in *Populus trichocarpa* leaves. Biotechnol. for Biofuels and Bioproducts 16, Article number: 41 https://doi.org/10.1186/s13068-023-02287-2

Dahal, S., G.B. Hurst, K. Chourey, N.L. Engle, L.H. Burdick, J.L. Morrell-Falvey, T.J. Tschaplinski, M.J. Doktycz, and D.A. Pelletier. 2023. Mechanism for utilization of the *Populus*-derived metabolite salicin by a *Pseudomonas–Rahnella* co-culture. Metabolites 13(2):140. https://doi.org/10.3390/metabo13020140

Cope K.R., E.T. Prates, J.I. Miller, O. Demerdash, M. Shah, D. Kainer, A. Cliff, K. Sullivan, M. Cashman, M. Lane, A. Matthiadis, J. Labbé, T.J. Tschaplinski, D.A. Jacobson, and U.C. Kalluri. 2023. Exploring the role of plant lysin motif receptor-like kinases in regulating plant-microbe interactions in the bioenergy crop *Populus*. Computational and Structural Biotechnol. J. 21:1122-1139. https://doi.org/10.1016/j.csbj.2022.12.052

Rasor, B.J., P. Chirania, G.A. Rybnicky, R.J. Giannone, N.L. Engle, T.J. Tschaplinski, A.S. Karim, R.L. Hettich, and M.C. Jewett. 2023. Mechanistic insights into cell-free gene expression through an integrated-omics analysis of extract processing methods. ACS Synth. Biol. 12:405–418 https://doi.org/10.1021/acssynbio.2c00339

Liu, Y., G. Yuan, Md.M. Hassan, P.E. Abraham, J.C. Mitchell, D. Jacobson, G.A. Tuskan, A. Khakhar, J. Medford, C. Zhao, C.-J. Liu, C.A. Eckert, M.J. Doktycz, T.J. Tschaplinski, and X. Yang. 2022. Biological and molecular components for genetically engineering biosensors in plants. BioDesign Res. 9863496. https://doi.org/10.34133/2022/9863496.

Him K. Shrestha, H.K., R.A. Dixon, N.L. Engle, T.J. Tschaplinski, R.L. Hettich, J. Barros, and P.E. Abraham. 2022. Multi-omic characterization of bifunctional peroxidase 4-coumarate 3-hydroxylase knockdown in *Brachypodium distachyon* provides insights into lignin modification-associated pleiotropic effects. Front. Plant Sci. 13:908649. https://doi.org/10.3389/fpls.2022.908649

Hu, R., J. Zhang, S. Jawdy, A. Sreedasyam, A. Lipzen, M. Wang, V. Ng, C. Daum, K. Keymanesh, D. Liu, H. Lu, P. Ranjan, J.-G. Chen, W. Muchero, T.J. Tschaplinski, G.A. Tuskan, J. Schmutz, X. Yang. 2022. Comparative genomics analysis of drought response between obligate CAM and C3 photosynthesis plants. J. Plant Physiol. 277:153791. Epub 2022 Aug 8 https://doi.org/10.1016/j.jplph.2022.153791

Dove, N.C., A.A. Carrell, N. Engle, D.M. Klingeman, M. Rodriguez, M.Z. Martin, T.J. Tschaplinski, W. Muchero, C.W. Schadt, and M.A. Cregger. 2022. Relationships between

Sphaerulina musiva infection and the *Populus* sp. microbiome and metabolome. mSystems 7 (4) https://doi.org/10.1128/msystems.00120-22

Yuan, G., H. Lu, T.J. Tschaplinski, G.A. Tuskan, X. Yang. 2022. Reporter genes confer new-to-nature ornamental traits in plants. Hort. Res. Volume 9, 2022, uhac077, https://doi.org/10.1093/hr/uhac077

Barros, J., H.K. Shrestha, J.C. Serrani-Yarce, N.L. Engle, P.E. Abraham, T.J. Tschaplinski, R.L. Hettich, and R.A. Dixon 2022. Proteomic and metabolic disturbances in lignin-modified *Brachypodium distachyon*. The Plant Cell koac171, https://doi.org/10.1093/plcell/koac171

Bewg, W., S. Harding, N. Engle, B. Vaidya, R. Zhou, J. Reeves, T. Horn, N. Joshee, J. Jenkins, S. Shu, K. Barry, Y. Yoshinaga, J. Grimwood, R. Schmitz, J. Schmutz, T.J. Tschaplinski, and C.-J. Tsai. 2022. Multiplex knockout of trichome-regulating MYB duplicates in hybrid poplar using a single gRNA. Plant Phys. 189: 516–526 https://doi.org/10.1093/plphys/kiac128

Hu, X.-L., J. Zhang, R. Kaundal, R. Kataria, J.L. Labbe, J.C. Mitchell, T.J. Tschaplinski, G.A. Tuskan, and Z.-M. Cheng, and X. Yang. 2022. Diversity and conservation of plant small secreted proteins associated with arbuscular mycorrhizal symbiosis. Hort. Res. Volume 9, 2022, uhac043, Published: 19 February 2022 https://doi.org/10.1093/hr/uhac043

Zhuo, C., X. Wang, M. Docampo-Palacios, B.C. Sanders, N.L. Engle, T.J. Tschaplinski, J.H. Rajeswaran, C. Maranas, F. Chen, and R.A. Dixon. 2022. Developmental changes in lignin composition are driven by both monolignol supply and laccase specificity. Sci. Adv. 8, eabm8145 https://doi.org/10.1126/sciadv.abm8145

Liew, F., R. Nogle, T. Abdalla, B.J. Rasor, C. Canter, R.O. Jensen, L. Wang, J. Strutz, P. Chirania, S. De Tissera, A.P. Mueller, Z. Ruan, A. Gao, L. Tran, J.C. Bromley, J. Daniell, R. Conrado, N.L. Engle, T.J. Tschaplinski, R.J. Giannone, R.L. Hettich, A.S. Karim, S.D. Simpson, S.D. Brown, C. Leang, M.C. Jewett, and M. Köepke. 2022. Carbon-negative production of acetone and isopropanol by gas fermentation at industrial pilot scale. Nature Biotech. 40:335-344. https://doi.org/10.1038/s41587-021-01195-w

Villalobos Solis, M.I., N.L. Engle, M.K. Spangler, S. Cottaz, S. Fort, J. Maeda, J.-M. Ané, T.J. Tschaplinski, J. L. Labbé, R. L. Hettich, P.E. Abraham, and T.A. Rush. 2022. Expanding the biological role of lipo-chitooligosaccharides and chitooligosaccharides in *Laccaria bicolor* growth and development. Front. Fungal Biol. 3:808578. https://doi.org/10.3389/ffunb.2022.808578

Sacko, O., N.L. Engle, T.J. Tschaplinski, S. Kumar, and J. Lee. 2022. Ozonized biochar filtrate effects on the growth of *Pseudomonas putida* and cyanobacteria *Synechococcus elongatus* PCC 7942. Bioresour. Bioprocess. 9, 2 (2022). https://doi.org/10.1186/s40643-021-00491-2

Bonito, G., M.-Y. Chou, M.A. Cregger, J.L. Field, H.G. Martin, A.C. Howe, J.L. Labbe, M.E. Mechan-Llontop, T.R. Northen, A. Shade, and T.J. Tschaplinski. 2022. Frontiers and opportunities in bioenergy crop microbiome research networks. Phytobiomes J. 6:118-126 https://doi.org/10.1094/PBIOMES-05-21-0033-MR

Yang, X., D. Liu, H. Lu, D.J. Weston, J.-G. Chen, W. Muchero, S. Martin, Y. Liu, M.M. Hassan, G. Yuan, U.C. Kalluri, T.J. Tschaplinski, J.C. Mitchell, S.D. Wullschleger, and G.A. Tuskan. 2021. Biological parts for plant biodesign to enhance land-based carbon dioxide removal. BioDesign Res, vol. 2021, Article ID 9798714, 22 pages, 2021.

https://doi.org/10.34133/2021/9798714

Devireddy, A.R., T.J. Tschaplinski, G.A. Tuskan, W. Muchero, and J.-G. Chen. 2021. Role of reactive oxygen species and hormones in plant responses to temperature changes. Int J Mol Sci 2021, 22: 8843. https://doi.org/10.3390/ijms22168843

Yao, T., K. Feng, M. Xie, J. Barros, T.J. Tschaplinski, G.A. Tuskan, W. Muchero, J.-G. Chen. 2021. Phylogenetic occurrence of the phenylpropanoid pathway and lignin biosynthesis in plants. Front. Plant Sci., 17 August 2021, 12:1673 https://doi.org/10.3389/fpls.2021.704697

Qiao, Z., T.B. Yates, H.K. Shrestha, N.L. Engle, A. Flanagan, J.L. Morrell-Falvey, Y. Sun, T.J. Tschaplinski, P.E. Abraham, J. Labbé, Z.-Y. Wang, R.L. Hettich, G.A. Tuskan, W. Muchero, and J.-G. Chen. 2021. Towards engineering ectomycorrhization into switchgrass bioenergy crops via a lectin receptor-like kinase. Plant Biotechnol. J. 9(12):2454-2468 https://doi.org/10.1111/pbi.13671

Hu, X.-L., H. Lu, M.M. Hassan, J. Zhang, G. Yuan, P.E. Abraham, H.K. Shrestha, M.I.V. Solis, J.-G. Chen, T.J. Tschaplinski, M.J. Doktycz, G.A. Tuskan, Z.-M. Cheng, and X. Yang. 2021. Advances and perspectives in discovery and functional analysis of small secreted proteins in plants. Hort. Res. 8:130 https://doi.org/10.1038/s41438-021-00570-7

Fackler, N., B.D. Heijstra, B.J. Rasor, H. Brown, J. Martin, Z. Ni, K.M. Shebek, R.R. Rosin, S.D. Simpson, K.E. Tyo, R.J. Giannone, R.L. Hettich, T.J. Tschaplinski, C. Leang, S.D. Brown, M.C. Jewett, and M. Köepke. 2021. Stepping on the Gas to a Circular Economy: Accelerating Development of Carbon-Negative Chemical Production from Gas Fermentation. Ann. Rev. Chem. and Biomol. Eng. 12:439-470 https://doi.org/10.1146/annurev-chembioeng-120120-021122

Cregger, M.A., D.L. Carper, S. Christel, M.J. Doktycz, J. Labbé, J. Michener, J. Morrell-Falvey, W. Muchero, D.A. Pelletier, S. Retterer, T.J. Tschaplinski, G.A. Tuskan, D.J. Weston, and C.W. Schadt. 2021. Plant-microbe interactions: from genes to ecosystems using *Populus* as a model system. Phytobiomes J. 24 Mar 2021. https://doi.org/10.1094/PBIOMES-01-20-0009-FI

Yao, T., J. Zhang, M. Xie, G. Yuan, T.J. Tschaplinski, W. Muchero, and J.-G. Chen. 2020. Transcriptional regulation of drought response in Arabidopsis and woody plants. Front. Plant Sci., 08 January 2021 https://doi.org/10.3389/fpls.2020.572137

Jiang, S.C., N.L. Engle, Z.Z. Banday, N.M. Cecchini, H.W. Jung, T.J. Tschaplinski, and J.T. Greenberg. 2020. ALD1 accumulation in Arabidopsis epidermal plastids confers local and nonautonomous disease resistance. J. Exp. Bot. 72:2710-2726. https://doi.org/10.1093/jxb/eraa609

Yang, X., J.I. Medford, K. Markel, P.M. Shih, H.C. De Paoli, C.T. Trinh, A.J. McCormick, R. Ployet, S.G. Hussey, A.A. Myburg, P.E. Jensen, M.M. Hassan, J. Zhang, W. Muchero, U.C. Kalluri, H. Yin, R. Zhuo, P. Abraham, J.-G. Chen, D. Weston, Y. Yang, D. Liu, Y. Li, J. Labbe, B. Yang, J.H. Lee, R.W. Cottingham, S. Martin, M. Lu, T.J. Tschaplinski, G. Yuan, H. Lu, P. Ranjan, J.C. Mitchell, S.D. Wullschleger, G.A. Tuskan. 2020. Plant Biosystems Design Research Roadmap 1.0. BioDesign Res., vol. 2020, Article ID 8051764, 38 pages, 2020. https://doi.org/10.34133/2020/8051764

Yuan, G., M.M. Hassan, D. Liu, S.D. Lim, W.C. Yim, J.C. Cushman, K. Markel, P.M. Shih, H. Lu,

D.J. Weston, J.-G. Chen, T.J. Tschaplinski, G.A. Tuskan, X. Yang. 2020. Biosystems design to accelerate C3-to-CAM progression. BioDesign Research Article ID 3686791, 16 pages https://doi.org/10.34133/2020/3686791

Xie, M., J. Zhang, T. Yao, A.C. Bryan, Y. Pu, J. Labbe, D.A. Pelletier, N. Engle, J.L. Morrell-Falvey, J. Schmutz, A.J. Ragauskas, T.J. Tschaplinski, F. Chen, G.A. Tuskan, W. Muchero, and J.G. Chen. 2020. Arabidopsis C-terminal Binding Protein ANGUSTIFOLIA modulates transcriptional co-regulation of MYB46 and WRKY33. New Phyt. 228: 1627–1639. https://doi.org/10.1111/nph.16826

Saint-Vincent, P.M.B., M. Ridout, N.L. Engle, T.J. Lawrence, M.L. Yeary, T.J. Tschaplinski, G. Newcombe, D.A. Pelletier. 2020. Isolation, characterization, and pathogenicity of two *Pseudomonas syringae* pathovars from *Populus trichocarpa* seeds. Microorganisms 8: 1137 https://doi.org/10.3390/microorganisms8081137

Chhetri, H.B., A. Furches, D.M. Sanz, A.R. Walker, D. Kainer, P. Jones, A.E. Harman-Ware, T. Tschaplinski, D. Jacobson, G.A. Tuskan, and S.P. DiFazio. 2020. Genome-wide association study of wood anatomical and morphological traits in *Populus trichocarpa*. Front. in Plant Sci. 11:545748 https://doi.org/10.3389/fpls.2020.545748

Lu, H., G. Yuan, S.H. Strauss, T.J. Tschaplinski, G.A. Tuskan, J.-G. Chen, and X. Yang. 2020. Reconfiguring plant metabolism for biodegradable plastic production. BioDesign Res. Article ID 9078303, 13 pages https://doi.org/10.34133/2020/9078303

Veach, A.M., H. Chen, Z.K. Yang, A. Labbe, N.L. Engle, T.J. Tschaplinski, C.W. Schadt, and M.A. Cregger. 2020. Plant hosts modify belowground microbial community response to extreme drought. mSystems https://doi.org/10.1128/mSystems.00092-20

Krüger, A., A.P. Mueller, G. A. Rybnicky, N.L. Engle, Z.K. Yang, T.J. Tschaplinski, S.D. Simpson, M. Köpke, M.C. Jewett. 2020. Development of a clostridia-based cell-free system for prototyping genetic parts and metabolic pathways. Metabolic Engineering 62:95-105. https://doi.org/10.1016/j.ymben.2020.06.004

Bryant, N.D., Y. Pu, T.J. Tschaplinski, G.A. Tuskan, W. Muchero, U.C. Kalluri, C.G. Yoo, and A.J. Ragauskas. 2020.Transgenic poplar designed for biofuels. Trends in Plant Science 25:881-896. https://doi.org/10.1016/j.tplants.2020.03.008

Zhang, J., G.A. Tuskan, T.J. Tschaplinski, W. Muchero, and J.-G. Chen. 2020. Transcriptional and post-transcriptional regulation of lignin biosynthesis pathway genes in *Populus*. Front. Plant Sci. 11:652 Published online May 25, 2020 http://doi.org/10.3389/fpls.2020.00652

Simon, S.J., T.J. Tschaplinski, J. Leboldus, K. Keefover-Ring, M. Azeem, J.-G. Chen, D. Macaya-Sanz, W.L. MacDonald, W. Muchero, and S.P. DiFazio. 2020. Host plant genetic control of associated fungal and insect species in a *Populus* hybrid cross. Ecology and Evolution 10:5119–5134. http://dx.doi.org/10.1002/ece3.6266

Mangeot-Peter, L., T.J. Tschaplinski, N.L. Engle, C. Venault-Fourrey, F. Martin, and A. Deveau. 2020. Impacts of soil microbiome variations on root colonization by fungi and bacteria and on the metabolome of *Populus tremula x alba*. Phytobiomes J. 4:142-155. https://doi.org/10.1094/PBIOMES-08-19-0042-R

Yang, X., D. Liu, T.J. Tschaplinski, and G.A. Tuskan. 2019. Comparative genomics can provide new insights into evolutionary mechanisms and gene function in CAM plants. J. Exp. Bot. 70(22):6539-6547. https://doi.org/10.1093/jxb/erz408

Uehling, J.K., M. Entler, H. Meredith, L. Millet, C. Timm, J. Aufrecht, G. Bonito, N. Engle, J.L. Labbé, M.J. Doktycz, S. Retterer, J. Spatafora, J.E. Stajich, T.J. Tschaplinski, and R. Vilgalys. 2019. Microfluidics and metabolomics reveal symbiotic bacterial-fungal interactions between *Mortierella elongata* and *Burkholderia* include metabolite exchange. Front. Microbiol 10:2163. https://doi:10.3389/fmicb.2019.02163

Xie, M. J. Zhang, V.R. Singan, M.J. Mcgranahan, P.R. LaFayette, S.S. Jawdy, N. Engle, C. Doeppke, T.J. Tschaplinski, M.F. Davis, E. Lindquist, J. Schmutz, W. Parrott, G.A. Tuskan, J.-G. Chen, and W. Muchero. 2020. Identification of functional single nucleotide polymorphism of *Populus trichocarpa* PtrEPSP-TF and determination of its transcriptional effect. Plant Direct 4:1-13. https://doi.org/10.1002/pld3.178

Zhang, J., M. Xie, M. Li, J. Ding, Y. Pu, A. Bryan, W. Rottmann, K. Winkeler, C. Collins, Cassandra, V. Singan, E. Lindquist, S. Jawdy, L. Gunter, N. Engle, X. Yang, K. Barry, T.J. Tschaplinski, J. Schmutz, G. Tuskan, W. Muchero, and J.-G. Chen. 2019. Overexpression of a Prefoldin β subunit gene reduces biomass recalcitrance in the bioenergy crop *Populus*. Plant Biotechnol. J. https://doi.org/10.1111/pbi.13254 pp. 1-13

Close, D.M., S.J. Cooper, X. Wang, P. Chirania, M. Gupta, J.R. Ossyra, R.J. Giannone, N. Engle, T.J. Tschaplinski, J.C. Smith, L. Hedstrom, J.M. Parks, and J.K. Michener. 2019. Horizontal transfer of a pathway for coumarate catabolism unexpectedly inhibits purine nucleotide biosynthesis. Molecular Microbiol. 112:1784–1797 https://doi.org/10.1111/mmi.14393

Yang, H., C.-G. Yoo, X. Meng, Y. Pu, W. Muchero, G.A. Tuskan, T.J. Tschaplinski, A.J. Ragauskas, and L. Yao. 2020. Structural changes of lignins in natural *Populus* variants during different pretreatments. Bioresource Tech. 295: 122240 https://doi.org/10.1016/j.biortech.2019.122240

Yao, I., C.G. Yoo, X. Meng, Y. Pu, W. Muchero, G.A. Tuskan, T.J. Tschaplinski, A.J. Ragauskas, and H. Yang. 2019. Physicochemical changes of cellulose and their influences on *Populus trichocarpa* digestibility after different pretreatments. BioResources 14:9658-9676. https://doi.org/10.15376/biores.14.4.9658-9676

Furches, A., D. Kainer, D. Weighill, A. Large, P. Jones, A.M. Walker, J. Romero, J.G.F.M. Gazolla, W. Joubert, M. Shah, J. Streich, P. Ranjan, J. Schmutz, A. Sreedasyam, D. Macaya-Sanz, N. Zhao, M.Z. Martin, X. Rao, R.A. Dixon, S. DiFazio, T.J. Tschaplinski, J.-G. Chen, G.A. Tuskan, and D. Jacobson. 2019. Finding new cell wall regulatory genes in *Populus trichocarpa* using multiple lines of evidence. Front. Plant Sci. 10: Article 1249, 08 October 2019 https://doi.org/10.3389/fpls.2019.01249

Weighill, D.A, T.J. Tschaplinski, G.A. Tuskan, and D.A. Jacobson. 2019. Data integration in poplar: ‘omics layers and integration strategies. Front. Genet. 10:874. https://doi.org/10.3389/fgene.2019.00874

Ha, C.M, D. Fine, A. Bahtia, X. Rao, M.Z. Martin, N.L. Engle, D.J. Wherrit, T.J. Tschaplinski, L.W. Sumner, and R.A. Dixon. 2019. Ectopic defense gene expression is associated with growth defects in *Medicago truncatula* lignin pathway mutants. Plant Phys. 181:63-84.

https://doi.org/10.1104/pp.19.00533

Labbé, J., W. Muchero, O. Czarnecki, J. Wang, X. Wang, A.C. Bryan, K. Zheng, Y. Yang, S.S. Jawdy, L.E. Gunter, W. Schackwitz, J. Martin, F. Le Tacon, T. Li, Z. Zhang, P. Ranjan, X. Yang, D.A. Jacobson, T.J. Tschaplinski, J. Schmutz, J-G. Chen, and G.A. Tuskan. 2019. Mediation of plant-mycorrhizal interaction by a lectin receptor-like kinase. Nature Plants 5:676-680. https://doi.org/10.1038/s41477-019-0469-x

Tao, J., K. Rajan, B. Ownley, K. Gwinn, D. D'Souza, N. Moustaid-Moussa, T.J. Tschaplinski, and N. Labbé. 2019. Natural variability and antioxidant properties of commercially cultivated switchgrass extractives. Industrial Crops and Products 138: 5 October 2019 https://doi.org/10.1016/j.indcrop.2019.111474

Veach, A.M., R. Morris, D.Z. Yip, Z.K. Yang, N.L. Engle, M.A. Cregger, T.J. Tschaplinski, and C.W. Schadt. 2019. Rhizosphere microbiomes diverge among *Populus trichocarpa* plant-host chemotypes, but it depends on soil origin. Microbiome 7:76 https://doi.org/10.1186/s40168-019-0668-8

Xie, H., N.L. Engle, S. Venketachalam, C.G. Yoo, J. Barros, M. Lecoultre, N. Howard, G. Li, L. Sun, A.C. Srivastava, S. Pattathil, Y. Pu, M.G. Hahn, A.J. Ragauskas, R.S. Nelson, R.A. Dixon, T.J. Tschaplinski, E.B. Blancaflor, and Y. Tang. 2019. Combining loss of function of folylpolyglutamate synthetase1 and caffeoyl-coA 3-O-methyltransferase1 for lignin reduction and improved saccharification efficiency in *Arabidopsis thaliana*. Biotech. for Biofuels 12:108 https://doi.org/10.1186/s13068-019-1446-3

Tschaplinski, T.J. and S.D. Simpson. 2019. Development of a sustainable green chemistry platform for production of acetone and downstream drop-in fuel and commodity products directly from biomass syngas via a novel energy conserving route in engineered acetogenic bacteria. ORNL CRADA FINAL REPORT NFE-16-06364

Weighill, D.A, P. Jones, C.R. Bleker, P. Ranjan, M. Shah, N. Zhao, M.Z. Martin, S.P. DiFazio, D. Macaya-Sanz, J. Schmutz, A. Sreedasyam, T.J. Tschaplinski, G.A. Tuskan, D.A. Jacobson. 2019. Multi-phenotype association decomposition: Unraveling complex gene-phenotype relationships. Front. Genet. 10:417 https://doi.org/10.3389/fgene.2019.00417

Barros, J. L. Escamilla-Trevino, L. Song, X. Rao, J.C. Serrani-Yarce, M.D. Palacios, N.L. Engle, T.J. Tschaplinski, F. Choudhury, B. Venables, R. Mittler, and R.A. Dixon. 2019. 4-Coumarate 3-hydroxylase in the lignin biosynthesis pathway is a cytosolic ascorbate peroxidase. Nature Comm. 10, Article number: 1994 (2019) https://www.nature.com/articles/s41467-019-10082-7#Sec25

Ray, P., P.E. Abraham, Y. Guo, R.J. Giannone, N.L. Engle, Z.K. Yang, D. Jacobson, R.L. Hettich, T.J. Tschaplinski, and K.D. Craven. 2019. Scavenging organic nitrogen and remodeling lipid metabolism are key survival strategies adopted by the endophytic fungi, *Serendipita vermifera* and *Serendipita bescii* to alleviate nitrogen and phosphorous starvation in vitro. Environmental Microbiology Reports 11(4):548-557 https://doi.org/10.1111/1758-2229.12757

Chhetri, H.B., D. Macaya-Sanz, D. Kainer, A.K. Biswal, J.-G. Chen, C. Collins, L.M. Evans, K. Hunt, S.S. Mohanty, T. Rosenstiel, D. Ryno, K. Winkeler, X. Yang, D. Jacobson, D. Mohnen, W. Muchero, S.H. Strauss, T.J. Tschaplinski, G.A. Tuskan, S.P. DiFazio. 2019. Multitrait genome-wide association analysis of *Populus trichocarpa* identifies key polymorphisms

controlling morphological and physiological traits. New Phytol. 223:293-309. https://doi.org/10.1111/nph.15777

Tuskan, G.A., W. Muchero, T.J. Tschaplinski, and A.J. Ragauskas. 2019. Population-level approaches reveal novel aspects of lignin biosynthesis, content, composition and structure. Current Opinions in Plant Biotechnol. 56:250–257. https://doi.org/10.1016/j.copbio.2019.02.017

Tschaplinski, T.J., P.E. Abraham, S.S. Jawdy, L.E. Gunter, M.Z. Martin, N.L. Engle, X. Yang, and G.A. Tuskan. 2019. The nature of the progression of drought stress drives differential metabolomic responses in *Populus deltoides*. Ann. Bot. 124:617-626. https://doi.org/10.1093/aob/mcz002

Garcia, B.J., J.L. Labbé, P. Jones, P.E. Abraham, I. Hodge, S. Climer S.S. Jawdy, L.E. Gunter, G.A. Tuskan, X. Yang, T.J. Tschaplinski, and D.A. Jacobson. 2018. Phytobiome and transcriptional adaptation of *Populus deltoides* to acute progressive drought and cyclic drought. Phytobiomes J. 2: 249-260. https://doi.org/10.1094/PBIOMES-04-18-0021-R.

Zhang, J., M. Li, A.C. Bryan, C.G. Yoo, W. Rottmann, K.A. Winkeler, C.M. Collins, V. Singan, E.A. Lindquist, S.S. Jawdy, L.E. Gunter, N.L. Engle, X. Yang, K. Barry, T.J. Tschaplinski, J. Schmutz, Y. Pu, A.J. Ragauskas, G.A. Tuskan, W. Muchero, and J.-G. Chen. Overexpression of a serine hydroxymethyltransferase increases biomass production and reduces recalcitrance in the bioenergy crop *Populus*. 2019, 3, 195. Sustainable Energy & Fuels https://doi.org/10.1039/c8se00471d

Clifton-Brown, J., A. Harfouche, M.D. Casler, H.D. Jones, W.J. Macalpine, D. Murphy-Bokern, L B. Smart, A. Adler, C. Ashman, D. Awty-Carroll, C. Bastien, S. Bopper, V. Botnari, M. Brancourt-Hulmel, Z. Chen, L.V. Clark, S.Cosentino, S. Dalton, C. Davey, O. Dolstra, I. Donnison, R. Flavell, J. Greef, S. Hanley, A. Hastings, M. Hertzberg, Tsai-Wen Hsu, L. Huang, A. Iurato, E. Jensen, X. Jin, U. Jørgensen, A. Kiesel, D.-S. Kim, J. Liu, J.P. McCalmont, B.G. McMahon, M. Mos, P. Robson, E.J. Sacks, A. Sandu, G. Scalici, K. Schwarz, D. Scordia, R. Shafiei, I. Shield, G. Slavov, B.J. Stanton, K. Swaminathan, G. Taylor, A.F. Torres, L.M. Trindade, T. Tschaplinski, G. Tuskan, T. Yamada, C.Y. Yu, R.F. Zalesny, J. Zong, and I. Lewandowski. Breeding progress and preparedness for mass-scale deployment of perennial lignocellulosic biomass crops switchgrass, miscanthus, willow, and poplar. Global Change Biology-Bioenergy First published: 19 September 2018 https://doi.org/10.1111/gcbb.12566

Xie, M., J. Zhang, T.J. Tschaplinski, G.A. Tuskan, J.-G. Chen, and W. Muchero. 2018. Regulation of lignin biosynthesis and its role in growth-defense tradeoffs. Frontiers in Plant Sci. 9:1427 https://doi.org/10.3389/fpls.2018.01427

Faraji, M., L.L. Fonseca, L. Escamilla-Treviño, J. Barros-Rios, N.L. Engle, Z.K. Yang, T.J. Tschaplinski, R.A. Dixon, and E.O. Voit. 2018. A dynamical model of lignin biosynthesis in *Brachypodium distachyon*. Biotech. for Biofuels 11:253. https://doi.org/10.1186/s13068-018-1241-6

Cecchini, N.M, S. Roychoudhry, D.J. Speed, K. Steffes, A.Tambe, K. Zodrow, K. Konstantinoff, H.W. Jung, N.L. Engle, T.J. Tschaplinski, and J.T. Greenberg. 2018. Underground azelaic acid-conferred resistance to *Pseudomonas syringae* in Arabidopsis. Molecular Plant-Microbe Interactions 32:86-94 https://dx.doi.org/10.1094/MPMI-07-18-0185-R

Yin, H., H.-B. Guo, D. Weston, A.M. Borland, P. Ranjan, P.E. Abraham, J. M. Wachira, G.A. Tuskan, T.J. Tschaplinski, S.D. Wullschleger, H. Guo, R. Hettich, A. Visel, S. Gross, Z. Wang, X. Yang. 2018. Diel rewiring and positive selection of ancient plant proteins enabled evolution of CAM photosynthesis. BMC Genomics 19:588 https://doi.org/10.1186/s12864-018-4964-7

Veach, A.M., D. Yip, N.L. Engle, A. Bible, J. Morrell-Falvey, T.J. Tschaplinski, U.C. Kalluri, C.W. Schadt. 2018. Modification of plant cell wall chemistry impacts metabolome and microbiome composition in field-grown *Populus* PdKOR1 RNAi plants. Plant and Soil 429:349-361. https://doi.org/10.1007/s11104-018-3692-8

Zhang, J., Y. Yang, K. Zheng, M. Xie, K. Feng, S.S. Jawdy, L.E. Gunter, P. Ranjan, V.R. Singan, N. Engle, E. Lindquist, K. Barry, J. Schmutz, N. Zhao, T.J. Tschaplinski, J. LeBoldus, G.A. Tuskan, J.-G. Chen & W. Muchero. 2018. Genome-wide association studies and expression-based quantitative trait loci analyses reveal roles of HCT2 in caffeoylquinic acid biosynthesis and its regulation by defense-responsive transcription factors in *Populus*. New Phytol. 220:502-516. https://doi.org/10.1111/nph.15297

Yao, L., H. Yang, C.G. Yoo, Y. Pu, X. Meng, W. Muchero, G. Tuskan, T. Tschaplinski, A.J. Ragauskas. 2018. Understanding the influences of different pretreatments on recalcitrance of *Populus* natural variants. Bioresource Tech. 265:75-81. https://doi.org/10.1016/j.biortech.2018.05.057

Xie, M., W. Muchero, A.C. Bryan, K. Yee, H.-B. Guo, J. Zhang, T.J. Tschaplinski, V.R. Singan, E. Lindquist, R.S. Payyavula, J. Barros-Rios, R. Dixon, N. Engle, R.W. Sykes, M. Davis, S. S. Jawdy, L.E. Gunter, O. Thompson, S.P. DiFazio, L.M. Evans, K. Winkler, C. Collins, J. Schmutz, H. Guo, U. Kalluri, M. Rodriguez, K. Feng, J.-G. Chen, and G.A. Tuskan. 2018. A 5-enolpyruvylshikimate 3-phosphate synthase functions as a transcriptional repressor in *Populus*. The Plant Cell 30:1645-1660. https://doi.org/10.1105/tpc.18.00168

Liu, D., K.J. Palla, R. Hua, R.C. Moseley, C. Mendoza, M. Chen, P.E. Abraham, J.L. Labbé, U.C. Kalluri, T.J. Tschaplinski, J.C. Cushman, A.M. Borland, G.A. Tuskan, Xiaohan Yang. 2018. Review: Perspectives on the basic and applied aspects of crassulacean acid metabolism (CAM) research. Plant Science 274:394-401. https://doi.org/10.1016/j.plantsci.2018.06.012

Weighill, D., P. Jones, M. Shah, P. Ranjan, W. Muchero, J. Schmutz, A. Sreedasyam, D. Macaya-Sanz, R. Sykes, N. Zhao, M.Z. Martin, S. DiFazio, T.J. Tschaplinski, G. Tuskan, and D. Jacobson. 2018. Pleiotropic and epistatic network-based discovery: Integrated networks for target gene discovery. Front. Energy Res. 6:30, 11 May 2018 https://doi.org/10.3389/fenrg.2018.00030

Sander, K., D. Chung, D. Hyatt, J. Westpheling, D.M. Klingeman, M. Rodriguez Jr., N.L. Engle, T.J. Tschaplinski, B.H. Davison, and S.D. Brown. 2018. Rex in *Caldicellulosiruptor bescii*: novel regulon members and its effect on the production of ethanol and overflow metabolites. MicrobiologyOpen 2018:e639. https://doi.org/10.1002/mbo3.639

Song, Y., D.A. Johnson, R. Peng, D.K. Hensley, P.V. Bonnesen, L. Liang, J, Huang, F. Yang, F, Zhang, R. Qiao, T. J. Tschaplinski, N.L. Engle, Z. Wu, D.A. Cullen, H.M. Meyer III, B.G. Sumpter, and A.J. Rondinone. 2018. A physical catalyst for the electrolysis of nitrogen to ammonia. Sci. Adv. 4:e1700336 https://doi.org/10.1126/sciadv.17003336

Whitham, J.M., Moon, J.-W., Rodriguez Jr., M., Engle, N.L., Klingeman, D.M, Rydzak, T, Abel,

M.M., Tschaplinski, T.J., Guss, A.M., and S.D. Brown. 2018. *Clostridium thermocellum* LL1210 pH homeostasis mechanisms informed by transcriptomics and metabolomics. Biotech. for Biofuels 11:98 https://doi.org/10.1186/s13068-018-1095-y

Ragauskas, A., O'Neill, H.M., and T.J. Tschaplinski. 2018. Characterization strategies for lignocellulosic biomass. Biofuels Digest website (http://www.biofuelsdigest.com/bdigest/2018/03/01/its-entirely-about-character-the-digests-2018-multi-slide-guide-to-characterizing-lignocellulosic-biomass).

Abraham, P.E., B. Garcia, L.E. Gunter, S.S. Jawdy, D.A. Jacobson, N.L. Engle, X. Yang, R.L. Hettich, G.A. Tuskan, and T.J. Tschaplinski. 2018. Quantitative proteome profile of water-deficit stress responses in *Populus deltoides* leaves. Plos One 13(2): e0190019. https://doi.org/10.1371/journal.pone.0190019

Faraji, M., L.L. Fonseca, L. Escamilla-Trevino, J. Barros-Rios, N.L. Engle, Z.K. Yang; T.J. Tschaplinski, R. A. Dixon, and E.O. Voit. 2018. Mathematical models of lignin biosynthesis. Biotech. for Biofuels. 11:34. https://doi.org/10.1186/s13068-018-1028-9

Timm, C., K. Carter, A. Carrell, S.-R. Jun, S. Jawdy, J. Velez, L. Gunter, Z. Yang, I. Nookaew, N. Engle, T.-Y. Lu, C. Schadt, T. Tschaplinski, M. Doktycz, G. Tuskan, D. Pelletier, and D. Weston. 2018. Abiotic stresses shift belowground *Populus*-associated bacteria towards a core stress microbiome. mSystems 3:e00070-17. https://doi.org/10.1128/mSystems.00070-17

Yang, Y., C.G. Yoo, K.A. Winkeler, C.M. Collins, M.A.W. Hinchee, S. Jawdy, L. Gunter, N. Engle, Y. Pu, X. Yang, T.J. Tschaplinski, A.J. Ragauskas, G.A. Tuskan, and J.-G. Chen. 2018. Overexpression of a Domain of Unknown Function 231-containing protein increases O-xylan acetylation and cellulose biosynthesis in *Populus*. Biotech. for Biofuels 10:311. https://doi.org/10.1186/s13068-017-0998-3

Yang, X., R. Hu, H. Yin, J. Jenkins, S. Shu, H. Tang, D. Liu, D.A. Weighill, W.C. Yim, J. Ha, K. Heyduk, D.M. Goodstein, H.-B. Guo, R.C. Moseley, E. Fitzek, S. Jawdy, Z. Zhang, M. Xie, J. Hartwell, J. Grimwood, P.E. Abraham, R. Mewalal, J.D. Beltrán, S.F. Boxall, L.V. Dever, K.J. Palla, R. Albion, T. Garcia, J.A. Mayer, S.D. Lim, C. M. Wai, P. Peluso, R. Van Buren, H.C. De Paoli, A.M. Borland, H. Guo, J.-G. Chen, W. Muchero, Y. Yin, D.A. Jacobson, T.J. Tschaplinski, R.L. Hettich, R. Ming, K. Winter, J.H. Leebens-Mack, J.A.C. Smith, J.C. Cushman, J. Schmutz, and G.A. Tuskan. 2017. The *Kalanchoë* genome provides insights into convergent evolution and building blocks of crassulacean acid metabolism. Nature Communications 8:1899. https://doi.org/10.1038/s41467-017-01491-7

Sander, K., K.G. Asano, D. Bhandari, G.J. Van Berkel, S.D. Brown, B. Davison, and T.J. Tschaplinski. 2017. Targeted redox and energy cofactor metabolomics in *Clostridium thermocellum* and *Thermoanaerobacterium saccharolyticum*. Biotech. for Biofuels. 10:270. https://doi.org/10.1186/s13068-017-0960-4

Macaya-Sanz, D., J.-G. Chen, U.C. Kalluri, W. Muchero, T.J. Tschaplinski, L.E. Gunter, S.J. Simon, A.K. Biswal, A.C. Bryan, R. Payyavula, M. Xie, Y. Yang, J. Zhang, D. Mohnen, G.A. Tuskan, and S.P. DiFazio. 2017. Agronomic performance of *Populus deltoides* trees engineered for biofuel production. Biotech. for Biofuels 10:253. https://doi.org/10.1186/s13068-017-0934-6

Martin, M., D. Glasgow, T.J. Tschaplinski, G.A. Tuskan, L.E. Gunter, and D.J. Weston. 2017.

Correlating laser-induced breakdown spectroscopy (LIBS) with neutron activation analysis (NAA) to determine the elemental concentration in the ionome of the *Populus trichocarpa* leaf. Spectra Chimica Acta B: Atomic Spectroscopy 138:46-53 https://doi.org/10.1016/j.sab.2017.10.008

Yoo, C.G., Y. Yang, X. Meng, W. Muchero, K.L. Yee, O.A. Thompson, M. Rodriguez Jr., G. Bali, N.L. Engle, E. Lindquist, V. Singan, J. Schmutz, S.P. DiFazio, T.J. Tschaplinski, G.A. Tuskan, J.-G. Chen, B. Davison, Y. Pu, and A.J. Ragauskas. 2017. Insights of biomass recalcitrance in *Populus trichocarpa* natural variants for biomass conversion. Green Chemistry 19: 5467-5478. https://doi.org/10.1039/C7GC02219K

Li, M., Y. Pu, T.J. Tschaplinski, and A.J. Ragauskas. 2017. 31P NMR characterization of tricin and its structurally similar flavonoids. ChemistrySelect 2(12):3557–3561. https://doi.org/10.1002/slct.201700735

Verbeke, T.J., R.J. Giannone, D.M. Klingeman, N.L. Engle, T. Rydzak, A.M. Guss, T.J. Tschaplinski, S.D. Brown, R.L. Hettich, and J.G. Elkins. 2017. Pentose sugars inhibit metabolism and increase expression of and AgrD-type cyclic pentatpeptide in *Clostridium thermocellum*. Scientific Reports 7:43355. https://doi.org/10.1038/srep43355

Li, M., Y. Pu, C.G. Yoo, E. Gjersing, S.R. Decker, C. Doeppke, T.J. Tschaplinski, N.L. Engle, R.W. Sykes, M.F. Davis, H.L. Baxter, M. Mazarei, C.N.J. Stewart, Jr., A.J. Ragauskas. 2017. Study of traits and recalcitrance reduction of field-grown COMT down-regulated switchgrass. Biotech. for Biofuels 10:12. https://doi.org/10.1186/s13068-016-0695-7

Vélez, J.M., T.J. Tschaplinski, R. Vilgalys, C.W. Schadt, J.L. Labbé, G. Bonito, K. Hameed, N. Engle, C.E. Hamilton. 2017. Characterization of a novel, ubiquitous fungal endophyte from the rhizosphere and root endosphere of *Populus* trees. Fungal Ecol. 27:78-86. https://doi.org/10.1016/j.funeco.2017.03.001

Uehling J, Gryganskyi A, Hameed K, Tschaplinski T, Misztal PK, Wu S, Desirò A, Vande Pol N, Du Z, Zienkiewicz A, Zienkiewicz K, Morin E, Tisserant E, Splivallo R, Hainaut M, Henrissat B, Ohm R, Kuo A, Yan J, Lipzen A, Nolan M, LaButti K, Barry K, Goldstein AH, Labbé J, Schadt C, Tuskan G, Grigoriev I, Martin F, Vilgalys R, Bonito G. 2017. Comparative genomics of *Mortierella elongata* and its bacterial endosymbiont *Mycoavidus cysteinexigens*. Environmental Microbiology: 19(8): 2964–2983 https://doi.org/10.1111/1462-2920.13669

Dash, M., Y.S. Yordanov, T. Georgieva, T.J. Tschaplinski, E. Yordanova, and V. Busov. 2017. Poplar PtabZIP1-like enhances lateral root formation and biomass growth under drought stress. The Plant Journal 89 (4): 692-705. https://doi:org/10.1111/tpj.13413

Poudel, S., R.J. Giannone, M. Rodriguez Jr, B. Raman, M. Z. Martin, N.L. Engle, I. Nookaew, S.D. Brown, T.J. Tschaplinski, D. Ussery, and R.L. Hettich. 2017. Integrated omics reveals the details of metabolic adaptation of *Clostridium thermocellum* ATCC-27405 grown on switchgrass. Biotechnol. for Biofuels 10:14 https://doi:org/10.1186/s13068-016-0697-5

Meng, X., Pu, Y., Yoo, C.G., Li, M., Bali, G., Park, D.-Y., Gjersing, E., Davis, M.F., Muchero, W., Tuskan, G.A., Tschaplinski, T.J., and Arthur J. Ragauskas. 2017. An in-depth understanding of biomass recalcitrance using natural poplar variants as the feedstock. ChemSusChem 10:139-150. https://doi:org/10.1002/cssc.201601303

Abraham, P., H. Yin, A.M. Borland, D. Weighill, S.D. Lim, H. Cestari De Paoli, N.L. Engle, R. Agh, D.J. Weston, S.D. Wullschleger, T. Tschaplinski, D. Jacobson, J.C. Cushman, R.L. Hettich, G.A. Tuskan, X. Yang. 2016. Transcript, protein and metabolite temporal dynamics in the CAM plant *Agave*. Nature Plant 2: Article number 16178 https://doi.org/10.1038/nplants.2016.178

Kalluri UC, Payyavula RS, Labbé JL, Engle N, Bali G, Jawdy SS, Sykes RW, Davis M, Ragauskas A, Tuskan GA, and TJ Tschaplinski. 2016. Down-regulation of KORRIGAN-like endo-β-1,4-glucanase genes impacts carbon partitioning, mycorrhizal colonization and biomass production in *Populus*. Front. Plant Sci. 7:1455. https://doi.org/10.3389/fpls.2016.01455

Sun, Q., R. Khunsupat, N.C. Gallego, N. Labbé, J.J. Bozell, T.G. Rials, G.A. Tuskan, T.J. Tschaplinski, A.K. Naskar, and A.J. Ragauskas. 2016. A study of poplar organosolv lignin after melt rheology treatment as carbon fiber precursors. Green Chemistry 18: 5015-5024 https://doi.org/10.1039/C6GC00977H

Lin, J, Mazarei, M., Zhou, N., Hatcher, C., Wuddineh, W., Rudis, M., Tschaplinski, T., Pantalone, V., Arelli, P., Hewezi, T., Chen, F. Stewart, N. 2016. Transgenic soybean overexpressing GmSAMT1 exhibits resistance to multiple-HG types of soybean cyst nematode *Heterodera glycines*. Plant Biotechnology J. 14:2100-2109. https://doi.org/10.1111/pbi.12566

Timm, C.M., D.A. Pelletier, S.S. Jawdy, L.E. Gunter, J.A. Henning, N. Engle, J. Aufrecht, E. Gee, I. Nookaew, Z. Yang, T.-Y. Lu, T.J. Tschaplinski, M.J. Doktycz, G.A. Tuskan, and D.J. Weston. 2016. Two poplar-associated bacterial isolates induce additive favorable responses in a constructed plant-microbiome system. Frontiers in Plant Science 7: 497. https://doi.org/10.3389/fpls.2016.00497

Bible, A.N., S.J. Fletcher, D.A. Pelletier, C.W. Schadt, S.S. Jawdy, D.J. Weston, N.L. Engle, T.J. Tschaplinski, R. Masyuko, S. Polisetti, P.W. Bohn, T.A. Coutinho, M.J. Doktycz, and J.L. Morrell-Falvey. 2016. A carotenoid-deficient mutant in *Pantoea* sp. YR343, a bacteria isolated from the rhizosphere of *Populus deltoides*, is defective in root colonization. Frontiers in Microbiology 7:491. https://doi.org/10.3389/fmicb.2016.00491

Bryan, A., W. Muchero, S. Jawdy, L. Gunter, E. Gjersing, R. Sykes, N. Engle, T.J. Tschaplinski, X. Yang, G.A. Tuskan, J.-G. Chen. 2016. Knockdown of a laccase in *Populus deltoides* confers altered cell wall chemistry and increased sugar release. Plant Biotechnol. J. pp. 1-11. https://doi.org/10.1111/pbi.12560

Dumitrache, A., H. Akinosho, M. Rodriguez Jr., X. Meng, C. Geun Yoo, J. Natzke, N.L. Engle, R.W. Sykes, T.J. Tschaplinski, W. Muchero, A. Ragauskas, B.H. Davison, S.D. Brown. 2016. Consolidated bioprocessing of *Populus* using *Clostridium* (*Ruminiclostridium*) *thermocellum*: A case study on the impact of lignin composition and structure. Biotechnol. for Biofuels 9:31 https://doi:org/10.1186/s13068-016-0445-x

Weston D.J., A. Rogers, T.J. Tschaplinski, L.E. Gunter, S.A. Jawdy, N.L. Engle, G.A. Tuskan, and S.D. Wullschleger. 2015. Scaling nitrogen and carbon interactions: what are the consequences of biological buffering? Ecology and Evolution 5(14):2839–2850 https://doi:org/10.1186/s13068-016-0445-x10.1002/ece3.1565

Currie, D.H., B. Raman, C.M. Gowen, T.J. Tschaplinski, M.L. Land, S.D. Brown, S.F. Covalla, D.M. Klingeman, Z.K. Yang, N.L. Engle, C.M. Johnson, M. Rodriguez, A.J. Shaw, W.R.

Kenealy, L.R. Lynd, S.S. Fong, J.R. Mielenz, B.H. Davison, D.A. Hogsett, and C.D. Herring. 2015. Genome-scale resources for *Thermoanaerobacterium saccharolyticum.* BMC Sys Bio 9:30 https://doi:org/10.1186/s12918-015-0159-x

Rempe, C.S., K.P. Burris, H.L. Woo, B. Goodrich, D. Koessler Gosnell, T.J. Tschaplinski, and C.N. Stewart, Jr. 2015. Computational ranking of yerba mate small molecules based on their predicted contribution to antibacterial activity against methicillin-resistant *Staphylococcus aureus.* Plos One 10(5):e0123925. https://doi.org/10.1371/journal.pone.0123925

Cecchini, N.M, H.W. Jung, N.L. Engle, T.J. Tschaplinski, and J.T. Greenberg. 2015. ALD1 regulates basal immune components and early inducible defense responses in Arabidopsis. Molecular Plant-Microbe Interactions 28(4):455-66. https://doi.org/10.1094/MPMI-06-14-0187-R

Zhao, Q., Y. Zeng, Y. Yin, Y. Pu, L.A. Jackson, N.L. Engle, M.Z. Martin, T.J. Tschaplinski, S.-Y. Ding, A.J. Ragauskas, and R.A. Dixon. 2015. Pinoresinol reductase 1 impacts lignin distribution during secondary cell wall biosynthesis in Arabidopsis. Phytochemistry 112:170-178 https://doi.org/10.1016/j.phytochem.2014.07.008

Trajano, H.L., S. Pattathil, B.A. Tomkins, T.J. Tschaplinski, M.G. Hahn, G.J. Van Berkel, C.E. Wyman. 2015. Xylan hydrolysis in *Populus trichocarpa x P. deltoides* and model substrates during hydrothermal pretreatment. Bioresource Tech. 179: 202-210 https://doi.org/10.1016/j.biortech.2014.11.090

Payyavula R.S., T.J. Tschaplinski, S. S. Jawdy, R.W. Sykes, G.A. Tuskan, and U.C. Kalluri. 2014. Metabolic profiling reveals altered sugar and secondary metabolism in response to UGPase overexpression in *Populus*. BMC Plant Biology 14:265 https://doi.org/10.1186/s12870-014-0265-8

Clarkson, S.M., S.D. Hamilton-Brehm, R.J. Giannone, N.L. Engle, T.J Tschaplinski, R.L. Hettich, and J.G. Elkins. 2014. A comparative multidimensional LC-MS proteomic analysis reveals mechanisms for furan aldehyde detoxification in *Thermoanaerobacter pseudethanolicus* 39E. Biotech. for Biofuels 7:165 https://doi.org/10.1186/s13068-014-0165-z

Holwerda, E.K., P. Thorne, D.G. Olson, D. Amador-Noguez, N.L. Engle. T.J. Tschaplinski, J.P. van Dijken, and L.R. Lynd. 2014. The exometabolome of *Clostridium thermocellum* reveals overflow metabolism at high cellulose loading. Biotech. for Biofuels 7:155 https://doi.org/10.1186/s13068-0140155-1

Kapuscinski, K.L., J. M. Farrell, S.V. Stehman, G.L. Boyer, D.D. Fernando, M.A. Teece, T.J. Tschaplinski. 2014. Selective herbivory by an invasive Cyprinid, the rudd *Scardinius erythrophthalmus*. Freshwater Biol. 59:2315-2327 https://doi.org/10.1111/fwb.12433

Newhouse, A.E., L.D. Polin-McGuigan, K.A. Baier, K.E.R. Valletta, W.H. Rottmann, T.J. Tschaplinski, C.A. Maynard, and W.A. Powell. 2014. Transgenic American chestnuts show enhanced blight resistance and transmit the trait to T1 progeny. Plant Science 228:88-97. https://doi.org/10.1111/fwb.1243310.1016/j.plantsci.2014.04.004

Myburg, A.M., D. Grattapaglia, G.A. Tuskan, U. Hellsten, R.D. Hayes, J. Grimwood, J. Jenkins, E. Lindquist, H. Tice, D. Bauer, D.M. Goodstein, I. Dubchak, A. Poliakov, E. Mizrachi, A.R.K. Kullan, I. van Jaarsveld, S.G. Hussey, D. Pinard, K. van der Merwe, P. Singh, O.B. Silva-Junior,

R.C. Togawa, M.R. Pappas, D.A. Faria, C.P. Sansaloni, C.D. Petroli, X. Yang, P. Ranjan, T.J. Tschaplinski, … (and 51 others). 2014. The genome of *Eucalyptus grandis*. Nature: 510:356-362.

Ragauskas, A.J., G.T. Beckham, M.J. Biddy, R. Chandra, F. Chen, M.F. Davis, B.H. Davison, R.A. Dixon, P. Gilna, M. Keller, P. Langan, A.K. Naskar, J.N. Saddler, T.J. Tschaplinski, G.A. Tuskan, and C.E. Wyman. 2014. Lignin valorization: Improving lignin processing in the biorefinery. Science 344(6185):709. http://dx.doi.org/10.1126/science.1246843

Tschaplinski, T.J., J.M. Plett, N.L. Engle, A. Deveau, K.C. Cushman, M.Z. Martin, M.J. Doktycz, G.A. Tuskan, A. Brun, A. Kohler, F. Martin. 2014. *Populus trichocarpa* and *Populus deltoides* exhibit different metabolomic responses to colonization by the symbiotic fungus *Laccaria bicolor.* Molecular Plant-Microbe Interactions 27:546–556. http://dx.doi.org/10.1094/MPMI-09-13-0286-R

Borland, A.M., J. Hartwell, D.J. Weston, K.A. Schlauch, T.J. Tschaplinski, G.A. Tuskan, X. Yang and J. C. Cushman. 2014. Engineering crassulacean acid metabolism to improve water-use efficiency. Trends in Plant Sci. 19(5): 327-338. http://dx.doi.org/10.1016/j.tplants.2014.01.006

Yin, H., C.J. Chen, J. Yang, D.J. Weston, J.-G. Chen, W. Muchero, N. Ye, T.J. Tschaplinski, S.D. Wullschleger, Z.-M. Cheng, G.A. Tuskan, and X. Yang. 2014. Functional genomics of drought tolerance in bioenergy crops. Critical Reviews in Plant Sci. 33:205-224. http://dx.doi.org/10.1080/07352689.2014.870417

Li, Y., T. Xu, T.J. Tschaplinski, N.L. Engle, Y. Yang, D.E. Graham, Z. He, and J. Zhou. 2014. Improvement of cellulose catabolism in *Clostridium cellulolyticum* by sporulation abolishment and carbon alleviation. Biotechnol. for Biofuels 7:1-13 http://dx.doi.org/10.1186/1754-6834-7-25

Wilson, CM, M. Rodriguez Jr, C.M. Johnson, S.L. Martin, T. Ming Chu, R.D. Wolfinger, L.J. Hauser, M.M. Land, D.M. Klingeman, A.J. Ragauskas, T.J. Tschaplinski, J.R. Mielenz and S.D. Brown. 2013. Global transcriptome analysis of *Clostridium thermocellum* ATCC 27405 during growth on dilute acid pretreated *Populus* and switchgrass. Biotechnol. for Biofuels 6:179

Linville, J.L., M. Rodriguez, Jr., M. Land, M.H. Syed, N.L. Engle, T.J. Tschaplinski, J.R. Mielenz, C.D. Cox. 2013. Industrial Robustness: Understanding the mechanism of tolerance for the *Populus* hydrolysate-tolerant mutant strain of *Clostridium thermocellum.* Plos One 8(10): e78829. http://dx.doi.org/10.1371/journal.pone.0078829

Zhao N., Yao J.Z., Chaiprasongsuk M., Li G.L., Guan J., Tschaplinski T.J., Guo H., Chen F. 2013. Molecular and biochemical characterization of the jasmonic acid methyltransferase gene from black cottonwood (*Populus trichocarpa*). Phytochemistry 94: 74-81. http://dx.doi.org/10.1016/j.phytochem.2013.06.014

Trajano, H.L., N.L. Engle, M. Foston, A.J. Ragauskas, T.J. Tschaplinski, and C.E. Wyman. 2013. The fate of lignin during hydrothermal pretreatment. Biotechnol. for Biofuels 6:110 http://doi.org/10.1186/1754-6834-6-110

Kataeva, I., M. Foston, S.-J. Yang, S. Pattathil, A.K. Biswal, F.L. Poole II, M. Basen, A.M. Rhaesa, T.P. Thomas, P. Azadi, V. Olman, T.D. Saffold, K.E. Mohler, D.L. Lewis, C. Doeppke,

Y.N. Zeng, T.J. Tschaplinski, W.S. York, M. Davis, D. Mohnen, Y. Xu, R.M. Kelly, A. Ragauskas, S.Y. Ding, R.M. Kelly, M.G. Hahn, and M.W.W. Adams. 2013. Carbohydrate and lignin are simultaneously solubilized from unpretreated switchgrass by microbial action at high temperature. Energy and Environ. Sci. 6: 2186-2895

Yang, S., C. Pan, T.J. Tschaplinski, G.B. Hurst, N.L. Engle, W. Zhou, P. Dam, Y. Xu, L.T. Dice, B.H. Davison, and S.D. Brown. 2013. Systems biology analysis of *Zymomonas mobilis* ZM4 ethanol stress response. PloS One 9(6): e101305

Trupiano D., Y. Yordanov, S. Regan, R. Meilan, T.J. Tschaplinski, G.S. Scippa, and V. Busov. 2013. Identification, characterization of an AP2/ERF transcription factor that promotes adventitious, lateral root formation in *Populus*. Planta 238:271-281

van der Veen, D., J. Lo, S.D. Brown, C.M. Johnsson, T.J. Tschaplinski, M.Z. Martin, N.L. Engle, R.A. van den Berg, A.D. Argyros, N.C. Caiazza, A. M. Guss, and L.R. Lynd. 2013. Characterization of *Clostridium thermocellum* strains with disrupted fermentation end-product pathways. J Ind Microbiol Biotechnol 40:725–734 https://doi.org/10.1007/s10295-013-1275-5

Patel, D., M. Basu, S. Hayes, I. Majláth, F.M. Hetherington, T.J. Tschaplinski, K.A. Franklin. 2013. Temperature-dependent shade avoidance strategy involves the receptor-like kinase ERECTA. Plant J 73:980-92. https://doi.org/10.1111/tpj.12088
Epub 2012 Dec 31

Shen, H., C.R. Poovaiah, A. Ziebell, T.J. Tschaplinski, S. Pattathil, E. Gjersing, N.L. Engle, R. Katahira, Y. Pu, R. Sykes, F. Chen, A.J. Ragauskas, J.R. Mielenz, M.G. Hahn, M. Davis, N. Stewart Jr., R.A. Dixon. 2013. Enhanced characteristics of genetically modified switchgrass (*Panicum virgatum* L.) for high ethanol production. Biotechnol. Biofuels 6:71 https://doi.org/10.1186/1754-6834-6-71

Ye, C.-Y., T. Li, H. Yin, D.J. Weston, G.A. Tuskan, T.J. Tschaplinski, and X. Yang. 2013. Evolutionary analyses of non-family genes in plants. Plant J. 73(5):788-97. https://doi.org/10.1111/tpj.12073

Muchero, W., M.M. Sewell, R. Priya, L.E. Gunter, T.J. Tschaplinski, T.-M. Yin, and G.A. Tuskan. 2013. Genome anchored QTLs for biomass productivity in hybrid *Populus* grown under contrasting environments. PLoS One 8(1): e54468. https://doi.org/10.1371/journal.pone.0054468

Kridelbaugh, D.M., Nelson, J.C., Engle, N.L., Tschaplinski, T.J., Graham, D.E. 2013. Nitrogen and sulfur requirements for *Clostridium thermocellum* and *Caldicellulosiruptor bescii* on cellulosic substrates in minimal nutrient media. Bioresource Technology 130:125-135.

Páez, A., P.M. Páez, M.E. González, J.A. Urdaneta, D. Ringelberg, and T.J. Tschaplinski. 2013. The effect of light on fatty acid concentrations of purslane (*Portulaca oleracea* L.): A promising plant for decreasing serum cholesterol levels | Efecto de la luz en la concentración de ácidos grasos de la verdolaga (*Portulaca oleracea* L.) Planta prometedora para disminuir el colesterol sérico. Rev. Fac. Agron. (LUZ) 30:441-453.

Yee, K.L., M. Rodriguez Jr., T.J. Tschaplinski, N.L. Engle, M.Z. Martin, C. Fu, Z.-Y. Wang, S.D. Hamilton-Brehm, and J.R. Mielenz. 2012. Evaluation of the bioconversion of genetically modified switchgrass using simultaneous saccharification and fermentation and a consolidated

bioprocessing approach. Biotechnol. Biofuels 5:81. http://doi.org/10.1186/1754-6834-5-81

Tschaplinski, T.J., R.F. Standaert, N.L. Engle, M.Z. Martin, A.K. Sangha, J.M. Parks, J.C. Smith, R. Samuel, N. Jiang, Y. Pu, A.J. Ragauskas, C.Y. Hamilton, C. Fu, Z.-Y. Wang, B.H. Davison, R.A. Dixon, and J.R. Mielenz. 2012. Down-regulation of the caffeic acid *O*-methyltransferase gene in switchgrass reveals a novel monolignol analog. Biotechnol. for Biofuels 5:71. http://doi.org/10.1186/1754-6834-5-71

Yang, S., R.J. Giannone, L. Dice, Z.K. Yang, N.L. Engle, T.J. Tschaplinski, R.L. Hettich, and S.D. Brown. 2012. *Clostridium thermocellum* ATCC27405 transcriptomic, metabolomic and proteomic profiles after ethanol stress. BMC Genomics 13:336.

Weston, D., D.A. Pelletier, J.L. Morrell-Falvey, T.J. Tschaplinski, S. Jawdy, T.-Y. Lu, S.M. Allen, A.A. Karve, S.J. Melton, M.Z. Martin, C.W. Schadt, J. Chen, X. Yang, M.J. Doktycz, G.A. Tuskan. 2012. *Pseudomonas fluorescens* induces strain-dependent and strain-independent responses in defense networks, primary metabolism and photosynthesis. Molecular Plant-Microbe Interactions 25:765-778. http://doi.org/10.1094/MPMI-09-11-0253

Tuskan, G.A., J. Chen, S. DiFazio, P. Faivre-Rampant, M. Gudet, A. Harfouche, V. Jorge, J.L. Labbe, R. Priya, M. Sabatti, G. Slavov, N. Street, T.J. Tschaplinski, and T.-M. Yin. 2012. The obscure events contributing to the evolution of an incipient sex chromosome in *Populus* – A retrospective working hypothesis. Tree Genetics and Genomes http://doi.org/10.1007/s11295-012-0495-6

Li, Y., T.J. Tschaplinski, N.L. Engle, C.Y. Hamilton, M. Rodriguez Jr., J.C. Liao, C.W. Schadt, A.M. Guss, Y. Yang, and D.E. Graham. 2012. Combined inactivation of the *Clostridium cellulolyticum* lactate and malate dehydrogenase genes substantially increases ethanol yield from cellulose and switchgrass fermentations. Biotechnol. Biofuels 5:2 http://doi.org/10.1186/1754-6834-5-2

Ellis, L.D., E.K. Holwerda, D. Hogsett, S. Rogers, X. Shao, T.J. Tschaplinski, P. Thorne, L.R. Lynd. 2012. Closing the carbon balance for fermentation by *Clostridium thermocellum* (ATCC 27405). Bioresource Tech. 103:293-299.

Yang, X., T. Li, D. Weston, A.A. Karve, J.L. Labbe, L.E. Gunter, P. Sukumar, A.M. Borland, J. Chen, S.D. Wullschleger, T.J. Tschaplinski, and G.A. Tuskan. 2011. Innovative biological solutions to challenges in sustainable biofuels production. *In* Biofuel Production-Recent Developments and Prospects, Marco Aurélio dos Santos Bernardes (Ed.), ISBN: 978-953-307-478-8, InTech, Available from: http://www.intechopen.com/articles/show/title/innovative-biological-solutions-to-challenges-in-sustainable-biofuels-production

Yang, X., T.J. Tschaplinski, G.B. Hurst, S. Jawdy, P.E. Abraham, P.K. Lankford, R.M. Adams, M.B. Shah, R.L. Hettich, U. Kalluri, L. Gunter, C. Pennacchio, and G.A. Tuskan. 2011. Discovery and annotation of small proteins using genomics, proteomics, and computational approaches. Genome Research 21:634-641 http://doi.org/10.1101/gr.109280.110

Ye, C.-Y., T. Li, G.A. Tuskan, T.J. Tschaplinski, and X. Yang. 2011. Comparative analysis of GT14/GT14-like gene family in *Arabidopsis*, *Oryza*, *Populus*, *Sorghum* and *Vitis*. Plant Science 104:387-397.

van Dyk, M., A.R.K. Kullan, E. Mizrachi, C.A. Hefer, L. Jansen van Rensburg, T.J. Tschaplinski,

K.C. Cushman, N.E. Engle, G.A. Tuskan, N. Jones, A. Kanzler, A.A. Myburg. 2011. Genetic dissection of transcript, metabolite, growth and wood property traits in an F2 pseudo-backcross pedigree of *Eucalyptus grandis* x *E. urophylla*. BMC Proceedings 5(Suppl 7): O7.

Zhao, N., J. Guan, J.-L. Ferrer, N. Engle, M. Chern, P. Ronald, T.J. Tschaplinski, and F. Chen. 2010. Biosynthesis and emission of insect-induced methyl salicylate and methyl benzoate from rice. Plant Physiology and Biochemistry 48:279-287.

Pechanova, O., C.-H. Hsu, J.P. Adams, J.P., T. Pechan, L. Vandervelde, J. Drnevich, S. Jawdy, A. Adeli, J.C. Suttle, A.M. Lawrence, T.J. Tschaplinski, A. Séguin, and C. Yuceer. 2010. Apoplast proteome reveals that extracellular matrix contributes to multi-stress response in poplar. BMC Genomics 11:674 http://doi.org/10.1186/1471-2164-11-674

Yang, X., Y. Chu-Yu, Z.-M. Cheng, T.J. Tschaplinski, S.D. Wullschleger, W. Yin, X. Xia, and G.A. Tuskan. 2010. Genomic aspects of research involving polyploidy plants. Plant Cell, Tissue and Organ Culture Published online http://doi.org/10.1007/s11240-010-9826-1

Yang, X., U. C. Kalluri, S.P. DiFazio, S.D. Wullschleger, T.J. Tschaplinski, Z.-M. Cheng, and G.A. Tuskan. 2009. Poplar genomics: State of the science. Critical Reviews in Plant Sci. 28:375-392.

Chen, F., C.-J. Liu, T.J. Tschaplinski, and N. Zhao. 2009. Genomics of secondary metabolism in *Populus*: Interactions with biotic and abiotic environments. Critical Reviews in Plant Sci. 28:285-308.

Yang, S.-J., I. Kataeva, S.D. Hamilton-Brehm, N.L. Engle, T.J. Tschaplinski, C. Doeppke, M. Davis, J. Westpheling, and M.W.W. Adams. 2009. Efficient degradation of lignocellulosic plant biomass without pretreatment by the 9 thermophilic anaerobe, *Anaerocellum thermophilum* DSM 6725. Appl. Environ. Microbiol. 75:4762-4769.

Jung, H.W., T.J. Tschaplinski, L. Wang, J. Glazebrook, and J.T. Greenberg. 2009. Priming in systemic plant immunity. Science 324:89-91.

Zhao, N., J. Guan, F. Forouhar, T. J. Tschaplinski, Z.-M. Cheng, L. Tong, and F. Chen. 2009. Two poplar methyl salicylate esterases display comparable biochemical properties but divergent expression patterns. Phytochemistry 70:32-39.

Yang, X., S. Jawdy, T.J. Tschaplinski, and G.A. Tuskan. 2009. Genome-wide identification of lineage-specific genes in *Arabidopsis*, *Oryza* and *Populus*. Genomics 93:473-480.

Yang, S., T.J. Tschaplinski, N.L. Engle, S.L. Carroll, S.L. Martin, B.H. Davison, A.V. Palumbo, and S.D. Brown. 2009. Transcriptomic and metabolomic profiling of *Zymomonas mobilis* oxygen stress responses. BMC Genomics 10:34 (online)

Yang, X., U.C. Kalluri, S. Jawdy, L.E. Gunter, T.-M. Yin, T.J. Tschaplinski, D. Weston, P. Ranjan, and G.A. Tuskan. 2008. The F-Box Gene Family Is Expanded in Herbaceous Annual Plants Relative to Woody Perennial Plants. Plant Physiology 148:1189-1200.

Morse, A.M., T.J. Tschaplinski, C. Dervinis, P.M. Pijut, E.A. Schmelz, W. Day, and J.M. Davis. 2007. Salicylate and catechol levels are maintained in nahG transgenic poplar. Phytochemistry 68:2043-2052.

Yang, X., G.A. Tuskan, T.J. Tschaplinski, and Z.M. Cheng. 2007. Third-codon transversion rate-based Nymphaea basal angiosperm phylogeny - concordance with developmental evidence. Nature Precedings http://doi.org/10.1038/npre.2007.320.1

Davison, B.H., A.J. Ragauskas, R. Templer, T.J. Tschaplinski, and J.R. Mielenz. 2006. Measuring the Efficiency of Biomass Energy – Response. Science 312:1744-1745.

Ragauskas, A.J., C.K. Williams, B.H. Davison, G. Britovsek, J. Cairney, C.A. Eckert, J. Frederick, J.P. Hallett, D. Leak, C.L. Liotta, J.R. Mielenz, R. Murphy, R. Templer, and T. Tschaplinski. 2006. The path forward for biofuels and biomaterials. Science 27:484-489.

Tsai, C.-J., S.A. Harding, T.J. Tschaplinski, R.L. Lindroth, and Y. Yuan. 2006. Genome-wide analysis of the structural genes regulating defense phenylpropanoid metabolism in *Populus*. New Phytol. 172:47-62.

Busov, V., Meilan, R., Pearce, D., Rood, S., Ma, C., Tschaplinski, T., and S. Strauss. 2006. Transgenic modification of *gai* or *rgl1* causes dwarfing and alters gibberellins, root growth, and metabolite profiles in *Populus*. Planta 224:288-299.

Norby, R.J., S.D. Wullschleger, P.J. Hanson, C.A. Gunderson, T.J. Tschaplinski and J. D. Jastrow. 2006. CO_2 enrichment of a deciduous forest: The Oak Ridge FACE Experiment. pp. 231-251. *In* Nösberger J., Long S.P., Norby R.J., Stitt M., Hendrey G.R., Blum H. (eds.) Managed ecosystems and CO_2: Case Studies, Processes and Perspectives. Ecological Studies, Vol. 187. Springer, Berlin. 459 p.

Davis, M.F., G.A. Tuskan, M.M. Payne, T.J. Tschaplinski and R. Meilan. 2006. Assessment of *Populus* wood chemistry following the introduction of a Bt toxin gene. Tree Physiol. 26:557-564.

Tschaplinski, T., G.A. Tuskan, M.M. Sewell, G.M. Gebre, D.E. Todd and C.D. Pendley. 2006. Phenotypic variation and QTL identification for osmotic potential in an interspecific hybrid inbred F_2 poplar pedigree growing under contrasting environments. Tree Physiol. 26:595-604. https://doi.org/10.1093/treephys/26.5.595

Wullschleger, S.D., T.M. Yin, S.P. DiFazio, T.J. Tschaplinski, L.E. Gunter, M.F. Davis, and G.A. Tuskan. 2005. Phenotypic variation in growth and biomass distribution for two advanced-generation pedigrees of hybrid poplar. Can. J. For. Res. 35:1779-1789.

Hanson, P.J., S.D. Wullschleger, R.J. Norby, T.J. Tschaplinski and C.A. Gunderson. 2005. Importance of changing CO_2, temperature, precipitation, and ozone on carbon and water cycles of an upland-oak forest: Incorporating experimental results into model simulations. Global Change Biol. 11:1402-1423.

Tschaplinski, T.J. and G.M. Gebre. 2003. Leaf water potential, osmotic potential, and solute potential of several hardwood species as affected by manipulation of throughfall precipitation in an upland oak forest. *In* P.J. Hanson and S.D. Wullschleger (eds.). North American Temperate Deciduous Forest Response to Changing Precipitation Regimes. Springer, New York, pp. 121-139.

Tschaplinski, T.J. and P.J. Hanson. 2003. Dormant season nonstructural carbohydrate storage.

In P.J. Hanson and S.D. Wullschleger (eds.). North American Temperate Deciduous Forest Response to Changing Precipitation Regimes. Springer, New York, pp. 67-84.

Hanson, P.J., N.T. Edwards, T.J. Tschaplinski, S.D. Wullschleger and J.D. Joslin. 2002. Estimating the net primary and net ecosystem production of a southeastern upland *Quercus* forest from an 8-year biometric record. *In* P.J. Hanson and S.D. Wullschleger (eds.). North American Temperate Deciduous Forest Response to Changing Precipitation Regimes. Springer, New York, pp. 378-395.

Edwards, N.T., T.J. Tschaplinski and R.J. Norby. 2002. Stem respiration increases in CO_2-enriched sweetgum trees. New Phytol. 155:239-248.

Wullschleger, S.D., T.J. Tschaplinski, and R.J. Norby. 2002. Plant water relations at elevated CO_2 – Implications for water-limited environments. Plant, Cell and Environ. 25:319-331.

Gebre, G.M., and T.J. Tschaplinski. 2002. Solute accumulation of chestnut oak and dogwood leaves in response to throughfall manipulation of an upland oak forest. Tree Physiol. 22:251-260.

Norby, R.J., P.J. Hanson, E.G. O'Neill, T.J. Tschaplinski, J.F. Weltzin, R.T. Hansen, W. Cheng, S.D. Wullschleger, C.A. Gunderson, N.T. Edwards, and D.W. Johnson. 2002. Net primary productivity of a CO_2-enriched deciduous forest and the implications for carbon storage. Ecol. Appl. 12:1261-1266.

Paez, A., G.M. Gebre, M.E. Gonzalez, and T.J. Tschaplinski. 2000. Growth, soluble carbohydrates, and aloin concentration of *Aloe vera* plants exposed to three irradiance levels. Environ. and Exp. Bot. 44:133-139.

Tschaplinski, T.J., G.A. Tuskan, G.M. Gebre, and D.E. Todd. 1998. Drought resistance of two hybrid *Populus* clones grown under irrigation in large-scale plantations. Tree Physiol. 18:653-658.

Gebre, G.M., T.J. Tschaplinski, G.A. Tuskan, and D.E. Todd. 1998. Clonal and seasonal differences in leaf osmotic potentials and organic solutes of five hybrid poplar clones grown under field conditions. Tree Physiol. 18:645-652.

Tschaplinski, T.J., G.M. Gebre, and T.L. Shirshac. 1998. Osmotic potential of several hardwood species as affected by throughfall manipulation of an upland oak forest during a dry year. Tree Physiol. 18:291-298.

Gebre, G.M., T.J. Tschaplinski, and T.L. Shirshac. 1998. Water relations of several hardwood species in response to throughfall manipulation in an upland oak forest during a wet year. Tree Physiol. 18:299-305.

Wullschleger, S.D., P.J. Hanson, and T.J. Tschaplinski. 1998. Whole-plant water flux in understory red maple exposed to altered precipitation regimes. Tree Physiol. 18:71-79.

Páez, A., M.E. González, J.A. Urdaneta, D. Paredes, D. Tissue, and T. Tschaplinski. 1998. Indices de crecimiento y formación de compuestos orgánicos en *Barleria lupulina* sometida a dos condiciones de luminosidad. Rev. Fac. Agron. (LUZ) 15:515-525.

Blake, T.J., J. Sperry, T.J. Tschaplinski, and S.S. Wang. 1996. Water relations. *In* Stettler, R.F.,

H.D. Bradshaw, P.E. Heilman, and T.M. Hinckley (eds.). Biology of *Populus* and its implications for management and conservation. Part II. Chapter 16. Natural Sciences and Research Council of Canada, Ottawa, Canada, pp. 401-422. ISBN: 9780660165066

Land Jr., S.B., A.W. Ezell, S.H. Schoenholtz, G.A. Tuskan, T.J. Tschaplinski, M. Stine, H.D. Bradshaw, R.C. Kellison, and J. Portwood. 1996. Intensive culture of cottonwood and hybrid poplar. Proc. 35th LSU Forestry Symposium, Baton Rouge, LA, pp. 167-189.

Tschaplinski, T.J., D.B. Stewart, and R.J. Norby. 1995. Interactions between drought and elevated CO_2 on osmotic adjustment and solute concentrations of tree seedlings. New Phytol. 131:169-177.

Tschaplinski, T.J., G.M. Gebre, J.E. Dahl, G.T. Roberts, and G.A. Tuskan. 1995. Growth and solute adjustment of calli of *Populus* clones cultured on nutrient media containing polyethylene glycol. Can. J. For. Res. 25:1425-1433.

Tschaplinski, T.J., and T.J. Blake. 1995. Growth and carbohydrate status of coppice shoots of hybrid poplar following shoot pruning. Tree Physiol. 15:333-338.

Tschaplinski, T.J., D.B. Stewart, P.J. Hanson, and R.J. Norby. 1995. Interactions between drought and elevated CO_2 on growth and gas exchange of seedlings of three deciduous tree species. New Phytol. 129:63-71.

Tschaplinski, T.J., and L.L. Wright. 1994. Woody plant research of the biofuels feedstock development program. Biologue 12:32-35.

Tschaplinski, T.J., and G.A. Tuskan. 1994. Water-stress tolerance of black cottonwood and eastern cottonwood clones and four of their hybrid progeny. II. Metabolites and inorganic ions that constitute osmotic adjustment. Can. J. For. Res. 24:681-687.

Tschaplinski, T.J., G.A. Tuskan, and C.A. Gunderson. 1994. Water-stress tolerance of black cottonwood and eastern cottonwood clones and four of their hybrid progeny. I. Growth, water relations and gas exchange. Can. J. For. Res. 24:364-371.

Van Miegroet, H., R.J. Norby, and T.J. Tschaplinski. 1994. Nitrogen fertilization strategies in a short-rotation sycamore plantation. For. Ecol. and Management 64:13-24.

Tschaplinski, T.J., and T.J. Blake. 1994. Carbohydrate mobilization following shoot defoliation and decapitation in hybrid poplar. Tree Physiol. 14:141-151.

Tschaplinski, T.J., R.J. Norby, and S.D. Wullschleger. 1993. Responses of loblolly pine seedlings to elevated CO_2 and fluctuating water supply. Tree Physiol. 13:283-296.

Tschaplinski, T.J., and R.J. Norby. 1993. Physiological indicators of nitrogen response in short rotation sycamore plantations. II. Nitrogen metabolism. Can. J. Bot. 71:841-847.

Marland, G., V. Dale, R. Graham, R. Luxmoore, S. Marland, S. McLaughlin, R. Norby, W. M. Post, T. Tschaplinski, J. Tuskan, and L. Wright. 1993. Forest management for fixing and sequestering carbon. Proceedings of the Second U.S./Japan Workshop on Global Change Research: Environmental Response Technologies (Mitigation and Adaptation). Honolulu, Hawaii, U.S.A., Feb. 1-3, 1993. pp. 265-269.

D'Surney, S.J., T.J. Tschaplinski, N.T. Edwards, and L.R. Shugart. 1993. Biological responses of two soybean cultivars exposed to enhanced UVB radiation. Environ. and Exp. Bot. 33:1-10.

Blake, T.J., and T.J. Tschaplinski. 1992. Water relations. *In* P.C. Mitchell, L. Sennerby-Forsse, and T. M. Hinckley (eds.). Ecophysiology of Short Rotation Forest Crops, Chapter 3. Springer, Amsterdam. pp. 66-94. ISBN: 9781851668489

Koppenaal, R.S., T.J. Tschaplinski, and S.J. Colombo. 1992. Carbohydrate accumulation and turgor maintenance in seedling shoots and roots of two boreal forest conifers subjected to water stress. Can. J. Bot. 69:2522-2528.

Tschaplinski, T.J., and R.J. Norby. 1991. Physiological indicators of nitrogen response in short rotation sycamore plantations. I. CO_2 assimilation, photosynthetic pigments, and soluble carbohydrates. Physiol. Plant. 82:117-126.

Grossnickle, S.C., J.T. Arnott, J.E. Major, and T.J. Tschaplinski. 1991. Influence of dormancy induction treatments on western hemlock seedlings. I. Seedling development and stock quality assessment. Can. J. For. Sci. 21:164-174.

Tschaplinski, T. J., D. W. Johnson, R. J. Norby, and D. E. Todd. 1991. Biomass and soil nitrogen relationships of a one-year-old sycamore plantation. Soil Sci. Am. J. 55:841-847.

McCarthy, J.F., and T.J. Tschaplinski. 1991. Biological markers in animals and plants to establish exposure to, and effects of, atmospheric toxicants. In T. J. Moser, J. R. Baker, and D. T. Tingey (eds.). Ecological Exposure and Effects of Airborne Toxic Chemicals: An Overview. U.S. Environmental Protection Agency, Corvallis, OR. Report No. 600/3-91/001, pp. 107-127.

Tschaplinski, T.J., and T.J. Blake. 1989. Water-stress tolerance and late-season organic solute accumulation in hybrid poplar. Can. J. Bot. 67:1681-1688.

Tschaplinski, T.J., and T.J. Blake. 1989. Correlation between early root production, carbohydrate metabolism, and biomass production in hybrid poplar. Can. J. Bot. 67:2168-2174.

Tschaplinski, T.J., and T.J. Blake. 1989. Water relations, photosynthetic capacity, and root/shoot partitioning of photosynthate as determinants of productivity in hybrid poplar. Can. J. Bot. 67:1689-1697.

Tschaplinski, T.J., and T.J. Blake. 1989. The role of sink demand in carbon partitioning and photosynthetic reinvigoration following shoot decapitation. Physiol. Plant. 75:166-173.

Tschaplinski, T.J., and T.J. Blake. 1989. Photosynthetic reinvigoration of leaves following shoot decapitation, and accelerated growth of coppice shoots. Physiol. Plant. 75:157-165.

Blake, T.J., and T.J. Tschaplinski. 1986. Role of water relations and photosynthesis in the release of buds from apical dominance and the early reinvigoration of decapitated poplars. Physiol. Plant. 68:287-293.

Tschaplinski, T.J., and T.J. Blake. 1985. Effects of root restriction on growth correlations, water relations, and senescence of alder seedlings. Physiol. Plant. 64:167-176.

Blake, T.J., T.J. Tschaplinski, and A. Eastham. 1984. Stomatal control of water use efficiency in poplar clones and hybrids. Can. J. Bot. 62:1344-1351.

PATENTS - 3 total

US-9206436-B2	Key gene regulating cell wall biosynthesis and recalcitrance in *Populus*, gene Y
US-9161533-B2	Plant pathogen resistance
US-8318786-B2	Plant pathogen resistance

INVITED PRESENTATIONS

The American Chestnut Foundation (TACF) Biotechnology Convening, May 17-18, 2025, "Evidence for role of triterpenoid sterols in defense in Chinese chestnut"

TACF Science and Technology Spring Meeting, March 21, 2025, "Metabolic Pathways that contribute to blight resistance"

Biomass and Energy Crops VI, Sept. 30 - Oct. 4, 2024, Aberystwyth University, Aberystwyth, Wales. "Dehydration tolerance of black cottonwood (*Populus trichocarpa*) for sustainable biomass production"

Department of Plant Biology Guest Seminar, University of Victoria, Victoria, BC, Canada, March 8, 2024 "Metabolomics Driving Systems Biology and Biodesign Research at ORNL"

Oak Ridge Postdoctoral Association (ORPA) Research Seminar Series, Oak Ridge, TN, Sept. 8, 2023 "Metabolomics Driving Systems Biology and Biodesign Research at ORNL"

29th New Phytologist Workshop - Forest Tree Drought Physiology Research Innovation Group, Arnold Arboretum of Harvard University, Boston, MA, May 10, 2022 "Environmental regulation of genotype response to drought in *Populus* species and hybrids"

UT- Biochemistry & Cellular and Molecular Biology Graduate Colloquium, Knoxville, TN, April 4, 2022 "Metabolomic insights from studies of plant-microbe interactions and bioenergy research"

WATBIO Bioenergy Congress 2017, Oriel College, Oxford, UK, Sept. 25, 2017 "The nature of the progression of drought stress drives differential metabolomic responses in *Populus deltoides*"

National Academy of Sciences - Committee on Genetically Engineered Crops: Past Experience and Future Prospects – Public Meeting, Washington, DC, March 5, 2015 "Metabolomic analysis to confirm effects of transgenesis in plants"

Forest Health Initiative Early Blight Resistance Assay Workshop, Asheville, NC, May 17, 2010 "Mass spectrometry (MS)-based metabolomics"

Biochemistry Department Seminar, Oklahoma State University, Stillwater, OK, May 1, 2009 "Accelerated domestication of *Populus* for bioenergy production and enhanced C Sequestration"

WFCA/Inland Empire Tree Improvement Coop, Coeur d'Alene, ID, March 5, 2009 "The *Populus* genome: Sequencing, assembly, annotation, and utilization for accelerated domestication"

JGI: Genomics of Energy and Environment, Walnut Creek, CA, March 26-28, 2009 "Metabolomics and QTL analysis for identifying mQTL and gene discovery in poplar"

USDA HQ, Washington, DC, April 23, 2008 "Accelerated domestication of *Populus* for bioenergy production and enhanced C sequestration"

US-China Workshop on Environmental Aspects of Bioenergy Production and Sustainability, Knoxville, TN, Nov. 2, 2007 "Plant genomics in bioenergy research: Accelerated domestication of *Populus* for bioenergy production"

Tschaplinski, T.J. 2006. Accelerated Domestication of Populus: Harnessing the Recently-Sequenced Genome for Biomass and Bioproduct Production. Panel discussion titled "The Promise of a Genomics and Systems Approach to Accelerate the Development of Technologies for the Biological Production of Ethanol". Bio 2006 Congress, Chicago, IL, April 10, 2006

Tschaplinski, T.J. T. Yin, S. DiFazio, N. Engle, and G. Tuskan. 2005. Combining Metabolomics with QTL Analyses for Gene Discovery. Breakthrough Technologies Forum of IUFRO Tree Biotechnology Meeting, Pretoria, South Africa, November 6-11, 2005.

Tschaplinski, T.J. 2005. Populus metabolomics: A tool for gene discovery and assessment of metabolic perturbation. Bio 2005 Congress, Orlando, FL. April 20-22, 2005.

Tschaplinski, T.J. 2004. The use of metabolite profiling in high throughput phenotyping. Presented to Arborgen Corporation, Summerville, South Carolina, Feb. 11, 2004.

Tschaplinski, T.J., J. Cooke, T. Moritz, A. Polle, R. Jetter, and S. Harding. 2003. Metabolic characterization and metabolomics. Presented as Panel Coordinator at the International Poplar Genome Consortium, Umea, Sweden, June 7-12.

Tschaplinski, T.J. 2003. Metabolite profiling: Where are we and where are we going. Guest lecture at the School of Graduate Studies, University of Tennessee, March 3.

Tschaplinski, T.J., G.A. Tuskan, G.M. Gebre, and D.E. Todd. 1999. Genetic variation in osmotic potential in Populus. International Poplar Symposium, Orleans France, September 13-17.

Tschaplinski, T.J. 1993. USA country report of ecophysiological research funded by the U.S. Dept. of Energy. International Energy Agency, Task V Activity 2: Energy Forestry - Ecophysiology. Burlington, VT, September 2-4.

Tschaplinski, T.J. 1989. USA report of ecophysiological research funded by the DOE. International Energy Agency, Task V Activity 2: Energy Forestry - Ecophysiology. Ivy Lea, Ontario, September 20-22.

OTHER PRESENTATIONS

Inter-BRC Lignin Workshop, LBNL, Emeryville, CA, Oct. 21, 2019 "Lignin engineering/manipulation in plants"

Eucalypt Genetics (EucGen19), Hobart, Tasmania, Feb. 20, 2019 "Metabolomic responses of

down-regulated p-coumaroyl quinate/shikimate 3'-hydrolase (C3'H) and cinnamate 4-hydrolase (C4H) genes in the lignin biosynthetic pathway of *Eucalyptus urophylla x E. grandis* with reduced recalcitrance"

Frontiers in Biorefining, Saint Simons Island, GA, Nov. 8, 2018 "Metabolomics of *Populus deltoides* plants with modified gene activity prior to and within the lignin pathway reveals alterations in carbon flux to secondary metabolism"

International Poplar Symposium (IPS VII), Buenos Aires, Argentina, Oct. 30, 2018 "Metabolomics of *Populus deltoides* plants with modified gene activity prior to and within the lignin pathway reveals alterations in carbon flux to secondary metabolism"

InterBRC Lignin Workshop, NREL, Golden, CO. May 21-22, 2018 "Lignin analytics"

Plant and Animal Genome (PAG) XXVI, San Diego, CA, Jan. 14, 2018 "GCMS-based metabolomics of *Populus deltoides* plants with modified gene activity prior to and within the lignin pathway reveals alterations in carbon flux to secondary metabolism and the basis of altered biomass recalcitrance"

IUFRO Tree Biotechnology Conference, Concepción, Chile, June 4-9, 2017 "The nature of the progression of drought stress drives differential metabolomic responses in *Populus deltoides*"

Plant and Animal Genome (PAG) XXV, San Diego, CA, Jan. 15, 2017 "Metabolomic responses of down-regulated p-coumaroyl quinate/shikimate 3'-hydrolase (C3'H) and cinnamate 4-hydrolase (C4H) genes in the lignin biosynthetic pathway of *Eucalyptus urophylla x E. grandis* with reduced recalcitrance"

25th Session International Poplar Commission (IPC), Berlin, Germany, Sept. 14, 2016 "Metabolomic responses of down-regulated p-coumaroyl quinate/shikimate 3'-hydrolase (C3'H) and cinnamate 4-hydrolase (C4H) genes in the lignin biosynthetic pathway of *Eucalyptus urophylla x E. grandis* with reduced recalcitrance"

International Conference of Molecular Plant-Microbe Interactions, Portland, OR, July 18-21, 2016 "Metabolic consequences of the introduction of a *Populus trichocarpa* lectin receptor-like kinase into Arabidopsis thaliana, a non-ectomycorrhizal host species"

IUFRO Genomics and Forest Tree Genetics, Arcachon, France, May 30- June 3, 2016 "Metabolomic responses of Populus deltoides to cyclic and acute droughts"

IUFRO Tree Biotechnology Conference, Florence, Italy, June 8-12, 2015 "Coupling Metabolomics, mQTL and association genetics analyses to identify genes regulating the production of metabolites"

Plant and Animal Genome (PAG) XXIII, San Diego, CA, Jan. 11, 2015 "Coupling Metabolomics, mQTL and association genetics analyses to identify genes regulating the production of metabolites"

International Poplar Symposium (IPS) VI, Vancouver, BC, Canada, July 26, 2014 "Metabolic phenotype of disrupted cellulose synthesis and assembly in *Populus deltoides*"

International Conference of Molecular Plant-Microbe Interactions, Rhodes, Greece, July 2014,

Metabolomics of the *Populus-Laccaria* symbiosis”

IUFRO Tree Biotechnology Conference, Blacksburg, VA, May 31, 2009 “Accelerated domestication of Populus for bioenergy production and enhanced C sequestration”

Tschaplinski, T.J., Y.C. Wang, N.T. Edwards, R.V. Wilkerson, H.D. Bradshaw, M. Cunningham, B. Stanton, and R. Purnell. 2002. Biochemical regulation of crown architecture. AF&PA Agenda 2020 Annual Project Review, Chicago, IL, March 6-7.

Tschaplinski, T.J., Y.C. Wang, N.T. Edwards, R.V. Wilkerson H.D. Bradshaw, M. Cunningham, B. Stanton, and R. Purnell. 2001. Biochemical regulation of crown architecture. AF&PA Agenda 2020 Annual Project Review, Atlanta, GA, July 17.

Tschaplinski, T.J., H.D. Bradshaw, M. Cunningham, and B. Stanton. 1999. Biochemical regulation of crown architecture. AF&PA Agenda 2020 Annual Project Review, Atlanta, GA, August 30.

Tschaplinski, T.J., S.D. Wullschleger, G.M. Gebre, and R.J. Norby. 1998. Inhibition of dark respiration in leaves of trees by elevated CO2. Presented at the Joint Meeting of the North American Forest Biology Workshop and Western Forest Genetics Association, Victoria, B.C., June 21-28.

Tschaplinski, T.J., H.D. Bradshaw, M. Cunningham, and B. Stanton. 1998. Biochemical regulation of crown architecture. AF&PA Agenda 2020 Annual Project Review, Atlanta, GA, June 15.

Tschaplinski, T.J., Tuskan, G.A., Gebre, G.M., and D.E. Todd. 1997. Limits of drought tolerance in Populus. Presented at Annual Subcontractor's Meeting of the Biofuels Feedstock Development Program, Stillwater, OK, September 8-10.

Tschaplinski, T.J., G.M. Gebre, T.L. Shirshac, and C.A. Gunderson. 1996. Response of osmotic potential of hardwood species to altered precipitation in an upland oak forest. Presented at the Annual Meeting of the Ecological Society of America, Providence, RI, August 10-14.

Tschaplinski, T.J., Tuskan, G.A., Gebre, G.M., and D.E. Todd. 1996. Biochemical basis of drought tolerance in hybrid Populus grown under field production conditions. Presented at Annual Subcontractor's Meeting of the Biofuels Feedstock Development Program, Des Moines, IA, September 8-11.

Tschaplinski, T.J., and R.J. Norby. 1996. Long term biochemical consequences of elevated CO2 on yellow-polar and white oak trees. Presented at the 14th North American Forest Biology Workshop, Quebec City, Que., June 16-20.

Tschaplinski, T.J., Tuskan, G.A., Gebre, G.M., and D.E. Todd. 1994. Biochemical basis of drought tolerance in hybrid Populus grown under field production conditions. Presented at Annual Subcontractor's Meeting of the Biofuels Feedstock Development Program, Syracuse, NY, October 17-20.

Tschaplinski, T.J., Gebre, G.M., Dahl, J.E., Roberts, G.T., and G.A. Tuskan. 1994. Growth and solute adjustment in calli of Populus clones cultured on nutrient medium containing polyethylene glycol. Presented at the Joint Meeting of Western Mensuration and Western Forest Genetics

Assoc., Vancouver, WA., June 27-30.

Tschaplinski, T.J., Gebre, G.M., Dahl, J.E., Roberts, G.T., and G.A. Tuskan. 1994. Growth and solute adjustment in calli of Populus clones cultured on nutrient medium containing polyethylene glycol. Presented at the 13th Annual North American Forest Biology Workshop, Baton Rouge, LA, June 14-16.

Paez, A., Gebre, G.M., and T.J. Tschaplinski. 1994. The relationship between growth and soluble sugar concentration of Aloe vera plants grown under three levels of irradiance. Presented at the Annual Meeting of the Ecological Society of America, Knoxville, TN, August 7-11.

Tschaplinski, T.J., and G.A. Tuskan. 1993. Water stress tolerance of black cottonwood and eastern cottonwood clones and four of their hybrid progeny. Annual Subcontractor's Meeting of the Biofuels Feedstock Development Program, Auburn, AL, September 27-30.

Tschaplinski, T.J., and G.A. Tuskan. 1993. Water stress tolerance of black cottonwood and eastern cottonwood clones and four of their hybrid progeny. Annual Meeting of the American Society of Plant Physiologists, Minneapolis, MN, July 31-August 5.

Tschaplinski, T.J., and G.A. Tuskan. 1993. Water stress tolerance of black cottonwood and eastern cottonwood clones and four of their hybrid progeny. II. Metabolites and ions that constitute osmotic adjustment. Fourth Annual Walker Branch Watershed Research Symposium, Oak Ridge, TN, March 18-19.

Tschaplinski, T.J., G.A. Tuskan, and C.A. Gunderson. 1992. Water stress tolerance of black cottonwood and eastern cottonwood clones and four of their hybrid progeny. I. Growth, water relations and gas exchange. 12th North American Forest Biology Workshop, Sault St. Marie, Ontario, August 17-21.

Tschaplinski, T.J., G.A. Tuskan, and C.A. Gunderson. 1992. Water stress tolerance of black cottonwood and eastern cottonwood clones and four of their hybrid progeny. Second Annual Walker Branch Watershed Research Symposium, Oak Ridge, TN, March 26-27.

Tschaplinski, T.J., D.B. Stewart, P.J. Hanson, and R.J. Norby. 1991. Osmotic adjustment in five tree species under elevated CO2 and water stress. Annual Subcontractor's Meeting of the Biofuels Feedstock Development Program, Davis, CA, September 16-20.

Tschaplinski, T.J., D.B. Stewart, P.J. Hanson, and R.J. Norby. 1991. Osmotic adjustment in five tree species under elevated CO2 and water stress. American Society of Plant Physiologists, Albuquerque, NM, July 28-August 1.

Tschaplinski, T.J., D.B. Stewart, P.J. Hanson, and R.J. Norby. 1991. Osmotic adjustment in five eastern deciduous species under elevated CO2 and water stress. Second Annual Walker Branch Watershed Research Symposium, Oak Ridge, TN, March 21-23.

Tschaplinski, T.J. 1991. Drought resistance of Populus deltoides Bartr. cv. Siouxland. Southern Biomass Conference, Baton Rouge, LA, January 8-10.

Tschaplinski, T.J., and R.J. Norby. 1990. Elevated CO2 increases soluble sugar concentrations in roots of loblolly pine seedlings. Eleventh North American Forest Biology Workshop, Athens,

Georgia, June 12-15.

Tschaplinski, T.J., R.J. Norby, D.W. Johnson, and D.E. Todd. 1990. Nitrogen fertilization and drought resistance in sycamore plantations. First Annual Walker Branch Watershed Research Symposium, Oak Ridge, TN, March 29-31.

Tschaplinski, T.J., R.J. Norby, D.W. Johnson, and D.E. Todd. 1989. Optimum nitrogen nutrition in short-rotation sycamore plantations. American Society of Plant Physiologists, Toronto, Ontario, July 30-August 3.

Tschaplinski, T.J., and R.J. Norby. 1989. Foliar indicators of nitrogen fertilization response in short-rotation sycamore plantations. U.S. Dept. of Energy Terrestrial Energy Crops Program Subcontractor's Workshop, Washington DC, July 17-20.

Tschaplinski, T.J., and R.J. Norby. 1989. Water stress tolerance of trees: Implications for biomass plantations growing under increased drought and elevated CO2. U.S. Dept. of Energy Terrestrial Energy Crops Program Subcontractor's Workshop, Washington DC, July 17-20.

Tschaplinski, T.J., R.J. Norby, D.W. Johnson, and D.E. Todd. 1988. Optimum nitrogen nutrition in short-rotation sycamore plantations. U.S. Dept. of Energy Short Rotation Woody Crops Program Workshop, Tacoma, WA, August 1-4.

Koppenaal, R.S., T.J. Tschaplinski, and S.J. Colombo. 1988. Carbohydrate accumulation and turgor maintenance in seedling shoots and roots of two boreal forest conifers subjected to water stress. Tenth North American Forest Biology Workshop, Vancouver, British Columbia, July 20-22.

Tschaplinski, T.J., and T.J. Blake. 1988. Carbohydrate mobilization following shoot decapitation in hybrid poplar. American Society of Plant Physiologists National Meeting, Reno, NV, July 10-14.

Tschaplinski, T.J., and T.J. Blake. 1986. The role of carbon partitioning in growth and photosynthetic reinvigoration following shoot decapitation. Canadian Society of Plant Physiologists National Meeting, University of Saskatchewan, Saskatoon, Saskatchewan, June 16 18.

Tschaplinski, T.J., and T.J. Blake. 1986. Effects of shoot pruning on carbon partitioning in poplar trees. American Society of Plant Physiologists Annual Meeting, Louisiana State University, Baton Rouge, LA, June 8 13.

Tschaplinski, T.J., and T.J. Blake. 1984. The mobilization of carbohydrates and carbon partitioning in relation to vigorous growth of coppice shoots. Canadian Society of Plant Physiologists National Meeting, Burnaby, British Columbia, July 29 August 1.

Tschaplinski, T.J., and T.J. Blake. 1982. Rejuvenation and senescence studies in fast growing trees. II. The effects of root restriction on growth, water relations, and senescence in European alder. Joint Meeting of the Canadian Botanical Association and the Canadian Society of Plant Physiologists, University of Regina, Saskatchewan, June 20-24.

Tschaplinski, T.J., and T.J. Blake. 1981. The effects of root restriction on growth, water relations, and senescence of European alder (Alnus glutinosa Gaertn.) seedlings. Canadian

Society of Plant Physiologists, Toronto, Ontario, December 18.

Tschaplinski, T.J., and T.J. Blake. 1980. Rejuvenation, aging, and senescence in woody plants. II. Hormone and root/shoot relations. Canadian Society of Plant Physiologists, Queen's University, Kingston, Ontario, December 15.

THESES

Ph.D.	Physiological correlatives of vigorous growth in hybrid poplar.
M.Sc.F.	The effects of root restriction on growth, water relations and senescence of European alder (*Alnus glutinosa* Gaertn.) seedlings.
B.Sc.	The age composition of a collection of rabid and non-rabid Big Brown Bats (*Eptesicus fuscus*) as determined by dental annuli.

PROFESSIONAL SOCIETIES/ACTIVITIES

Journal of Advanced Research – Associate Editor (2026)
The American Chestnut Foundation (TACF) Biotechnology Convening (2025)
EMSL: Functional and Systems Biology Proposal Review Panel (2025)
DOE-GSP NOFO DE-FOA-0003452, Genomics-Enabled Understanding and Advancing Knowledge on Plant Gene Function(s) – Proposal Review Panel (2025)
DOE Resilient Bioenergy Crop Production Workshop – Participant (2024)
29th New Phytologist Workshop - Forest Tree Drought Physiology Research Innovation Group - Invited Speaker and Participant (2022)
Environmental and Experimental Botany – Editorial Board (2002 – present)
Tree Physiology – Editorial Review Board (intermittent from 1994 – present)
Plants: Plant Genetics and Genomics Section – Editorial Board (2020 – 2023)
Current Metabolomics and Systems Biology - Editorial Board (2012 - 2022)
Scientific Reports (a Nature journal) Editorial Board (2019)
National Academy of Science - GE Crops Safety – Provided Testimony (2015)
DOE-ARPA-E Phytosequestration Workshop (2015) - Participant
DOE-ARPA-E- Transportation Energy Resources from Renewable Agriculture (TERRA) - Workshop participant and Review Panel Member (2014)
ORNL Invention Disclosure Review Committee – (2008 - 2011)
DOE Genomic Science and Technology for Energy and the Environment Review – Microbial and Plant Processes for Bioenergy Reviewer (2010)
DOE-EREE High-Yield Scenario Workshop – Woody Energy Crops Participant (2009)
DOE 30x30 Workshop on Biomass Energy – Woody Crop Development panel member (2006)
Southeast Regional Biomass Consortium – Lead of Woody Crop Development (2006)
International Poplar Genome Consortium – Coordinator of the Metabolic Characterization and Metabolomics section of the Science Plan for post-genome sequencing research (2002)
Bioactive Natural Products Consortium – University of Tennessee – member (2002 – 2004)
National Science Foundation – Major Research Instruments Panel (1998)
US DOE rep. to the International Energy Agency Ecophysiology Working Group (1989-1993)
International Society for Molecular Plant-Microbe Interactions – member/participant
American Society of Plant Biologists – member/participant
Canadian Society of Plant Physiologists – member/participant

MENTORING

Hosted and/or mentored 66 visitor assignments to ORNL, including 3 University Faculty Members (Doris Garcia, Universidad Metropolitana-Puerto Rico; Leonard Price, Xavier University of Louisiana; Jonathan Cummin, West Virginia University), 10 Postdoctoral Research Associates and Distinguished Fellows (G. Michael Gebre, Yichuan (Connie) Yang, Manojit M. Basu, Xiaohan Yang, Nan Zhao, Zhihao Zhang, Jason Whitham, Suresh Poudel (co-supervised with Bob Hettich), Stephanie Galanie, and Lindsay Brown), 15 graduate students (served on the committees of 12 PhD and 3 MSc candidates), 7 Post-Bachelors, and 31 Undergraduate students (plus an additional 14 return assignments).

Served as the Group Leader for Metabolomics and Bioconversion Group for 13 years and Section Head for Biodesign and Systems Biology for 5.5 years. As Section Head, I have been involved in the interviews of 179 candidates for employment, and merit-based hiring of 83 employees (44 Postdocs, 39 Staff Members), with 77% being from underrepresented groups.

SCHOLARSHIPS

1985	Canadian Forestry Service Scholar Scholarship
1984	Natural Sciences & Engineering Research Council Postgraduate Scholarship – Forestry Special
1983	Natural Sciences and Engineering Research Council Postgraduate Scholarship
1982	Natural Sciences and Engineering Research Council Postgraduate Scholarship
1982	Edward Elsworth Johnson Postgraduate Forestry Fellowship
1981	University of Toronto Open Master's Fellowship
1980	Canadian National Sportsmen's Fellowship
1980	Natural Sciences and Engineering Research Council - Summer Research Award

SUCCESSFUL PROPOSALS

Total Funding all sources: **$678,978,000**
Total Center Grants and Science Focus Area Award (SFA) funds since FY2007: **$635,224,000**

Project title: Center for Bioenergy Innovation: Renewal – Jerry Tuskan (PI)
T.J. Tschaplinski – Co-PI, Research Council Member on the Leadership Team and Plant Metabolomics Lead, Poplar Team Lead as of 04-01-2024
Funding agency: DOE/Office of Biological and Environmental Research
Funding amount: $ 145,500,000
Funding period: FY2022-2027

Project title: Plant-Microbe Interfaces (PMI) SFA - M.J. Doktycz (PI)
T.J. Tschaplinski - Co-PI, Scientific Co-Manager
Funding agency: DOE/Office of Biological and Environmental Research
Funding amount: $ 20,874,000
Funding period: FY2023-2025

Project title: Plant-Microbe Interfaces (PMI) SFA - M.J. Doktycz (PI)
T.J. Tschaplinski - Co-PI, Scientific Co-Manager
Funding agency: DOE/Office of Biological and Environmental Research
Funding amount: $ 25,800,000
Funding period: FY2019-2022

Project title: Plant-Microbe Interfaces (PMI) SFA - M.J. Doktycz (PI)
T.J. Tschaplinski - Co-PI, Scientific Co-Manager
Funding agency: DOE/Office of Biological and Environmental Research
Funding amount: $ 19,350,000
Funding period: FY2016-2018

Project title: Center for Bioenergy Innovation – Jerry Tuskan (PI)
T.J. Tschaplinski – Co-PI, Research Council Member and Plant Metabolomics Lead
Funding agency: DOE/Office of Biological and Environmental Research
Funding amount: $ 125,000,000
Funding period: FY2017-2021

Project title: Plant-Microbe Interfaces (PMI) - M.J. Doktycz (PI), G.A. Tuskan (co-PI)
T.J. Tschaplinski - Metabolomics Lead Scientist for the PMI SFA
Funding agency: DOE/Office of Biological and Environmental Research
Funding amount: $ 19,350,000
Funding period: FY2013-2015

Project title: The Bioenergy Science Center: Renewal – Paul Gilna (PI)
T.J. Tschaplinski – 'Omics Activity Lead Scientist for BESC
Funding agency: DOE/Office of Biological and Environmental Research
Funding amount: $ 125,000,000
Funding period: FY2012-2016

Project title: Plant-Microbe Interfaces (PMI) - M.J. Doktycz (PI), G.A. Tuskan (co-PI)
T.J. Tschaplinski - Metabolomics Lead Scientist for the PMI SFA
Funding agency: DOE/Office of Biological and Environmental Research
Funding amount: $ 19,350,000
Funding period: FY2010-2012

Project title: The Bioenergy Science Center (BESC): Overcoming the recalcitrance of lignocellulosic biomass crops - M. Keller (PI)
T.J. Tschaplinski – co-PI; Metabolomics Lead Scientist for BESC
Funding agency: DOE/Office of Biological and Environmental Research
Funding amount: $ 135,000,000
Funding period: FY2007-2011

Total non-Center, non-SFA funds FY1991-2025: **$43,754,000** ($16,551,000 as PI)

Project Title: Carbon-negative chemical production platform (Michael Koepke, PI-LanzaTech.)
T.J. Tschaplinski - Co-PI (ORNL PI), Metabolomics Lead
Funding agency: DOE/ARPA-E
Total cost of the award: $450,000
Funding period: FY2022-2024

Project Title: Establishing a clostridia foundry for biosystems design by integrating computational modeling, systems-level analyses, and cell-free engineering technologies (Michael Jewett, PI-Northwestern Univ.)
T.J. Tschaplinski - Co-PI (ORNL PI; Steve Brown initial PI), Metabolomics Lead

Funding agency: DOE/Office of Biological and Environmental Research
Total cost of the award: $4,000,000
Funding period: FY2018-2022

Project Title: Development of a sustainable green chemistry platform for production of acetone and downstream drop-in fuel and commodity products directly from biomass syngas via a novel energy conserving route in engineered acetogenic bacteria (Sean Simpson, PI-LanzaTech)
T.J. Tschaplinski - Co-PI (ORNL PI; Steve Brown initial PI), Metabolomics Lead
Total cost of the award: $800,000
Funding period: FY2017-2019

Project Title: Synthetic metabolic pathways for bioconversion of lignin and biomass inhibitors
A. Guss (PI), J. Elkins, J. Mielenz, **T.J. Tschaplinski,** A. Gorin
Funding agency: Laboratory Director's Research and Development
Funding amount: $ 450,000
Funding period: FY2012-2013

Project Title: Nanoporous inorganic membranes for selective separations in high temperature flow-through recycle pretreatment of lignocellulosic biomass
R. Bhave (PI), J. Mielenz, **T.J. Tschaplinski**, L. Lynd, X Shao
Funding agency: Laboratory Director's Research and Development
Funding amount: $ 620,000
Funding period: FY2011-2012

Project Title: Unraveling the molecular and biochemical basis of crassulacean acid metabolism (CAM) in *Agave* for sustainable biofuel production
X. Yang (PI), D.J. Weston, S.D. Wullschleger, **T.J. Tschaplinski**
Funding agency: Laboratory Director's Research and Development
Funding amount: $ 750,000
Funding period: FY2011-2012

Project Title: Catalytic conversion of lignin feedstocks for bioenergy applications
W. Wang (PI), T.J. Phelps, J.C. Smith, J.J. Bozell, **T.J. Tschaplinski**, B. Gu, A.P. Borole
Funding agency: Laboratory Director's Research and Development
Funding amount: $ 312,000
Funding period: FY2010-2011

Project title: Genome-enabled discovery of carbon allocation genes in *Populus*
G.A. Tuskan (co-PI), **T.J. Tschaplinski (co-PI)**, U. Kalluri, J. M. Davis, S.P. DiFazio
Funding agency: DOE/Office of Biological and Environmental Research
Funding amount: $ 4,085,000 (renewal)
Funding period: FY2006-2008

Project title: Accelerated domestication in *Populus*: Harnessing the recently-sequenced genome for bioenergy crop production
T.J. Tschaplinski, T. Yin, X. Yang, L. Gunter, N. Engle, D. Kaczmarek, M. Hinchee
Funding agency: Laboratory Director's Research and Development
Funding amount: $730,000
Funding period: FY2006-2007

Project title: Biomass ethanol from *Clostridium thermocellum*: Linking bioprocessing with systems biology for bioenergy

J. Mielenz, S.D. Brown, D.A. Pelletier, G. Hurst, C. McKeown, **T.J. Tschaplinski**, G. Van Berkel, L. Lynd

Funding agency: Laboratory Director's Research and Development
Funding amount: $561,500
Funding period: FY2006-2007

Project title: Systemic approaches in recombinant *Zymomonas mobilis* to the regulation of ethanol fermentation

S.D. Brown, D.A. Pelletier, Y. Yang, G.B Hurst, **T.J. Tschaplinski**

Funding agency: Laboratory Director's Research and Development
Funding amount: $810,000
Funding period: FY2006-2007

Project title: Genome-enabled modification of poplar root development for increased carbon sequestration

R. Meilan (co-PI), V. Busov (co-PI), and **T.J. Tschaplinski (co-PI)**

Funding agency: DOE, Office of Biological and Environmental Research, Program for Ecosystem Research
Funding amount: $1,220,000
Funding period: FY2006-2008

Project title: Metabolic HERMES: Hierarchical Experimental Responses at Macromolecular to Ecosystem Scales
S.P. DiFazio, A. Rogers, C. Kuske, C. Schadt, **T.J. Tschaplinski**, S.D. Wullschleger
Funding agency: DOE, Office of Biological and Environmental Research, Program for Ecosystem Research
Funding amount: $5,395,000
Funding period: FY2005-2008

Project title: Metabolic profiling of phosphorylated and coenzyme-bound metabolites using pressure-assisted capillary electrophoresis mass spectrometry
T.J. Tschaplinski and G. Van Berkel
Funding agency: Laboratory Director's Research and Development
Funding amount: $125,000
Funding period: FY2005-2006

Project title: Temperature adjustment in forest species
C. A. Gunderson and **T.J. Tschaplinski**
Funding agency: Laboratory Director's Research and Development
Funding amount: $376,000 (one year extension)
Funding period: FY2005

Project title: Metabolite profiling: A required element in functional genomics
T.J. Tschaplinski and G. Van Berkel
Funding agency: Laboratory Director's Research and Development
Funding amount: $118,000
Funding period: FY2002-2003

Project title: Genome-enabled discovery of carbon sequestration genes in *Populus*
PI: G.A. Tuskan
Funding agency: DOE/Office of Biological and Environmental Research
Funding amount: $5,142,024
Funding period: FY2003-2005

Project title: Identifying critical thresholds for plant/ecosystem response to moisture stress
P.J. Hanson, **T.J. Tschaplinski**, S.D. Wullschleger, R.M. Auge
Funding agency: DOE, Office of Biological and Environmental Research, Program for Ecosystem Research
Funding amount: $1,276,000 (including 1 year extension)
Funding period: FY2002-2005

Project title: Biochemical bases pest feeding preference in hybrid *Populus* grown under field production conditions
T.J. Tschaplinski and R.V. Wilkerson
Funding agency: DOE, Biofuels Feedstock Development Program
Funding amount: $650,000
Funding period: FY2002-2006
Terminated at inception by DOE EERE elimination of BFDP woody crops research

Project title: Accelerated domestication of *Populus*
H.D. Bradshaw, S.H. Strauss, **T.J. Tschaplinski**, G.A.Tuskan, and S.D. Wullschleger
Funding agency: DOE, Office of Power
Funding amount: $1,740,000
Funding period: FY2002-2006
Terminated after 1 year by DOE EERE elimination of woody crops research

Project title: Genetic and environmental controls on carbon allocation and partitioning in woody plants – Implications for ecosystem carbon sequestration
S.D. Wullschleger, G.A. Tuskan, A.W. King, **T.J. Tschaplinski**
Funding agency: DOE, Office of Biological and Environmental Research, Carbon Sequestration Research Program
Funding amount: $1,102,000
Funding period: FY2001-2003

Project title: Free air CO_2 enrichment in a sweetgum plantation
PI: R.J. Norby
Funding agency: DOE/ Office of Biological and Environmental Research
Funding amount: $3,000,000
Funding period: FY2000-2002

Project title: Free-air CO_2 enrichment of a closed-canopy deciduous forest
R.J. Norby, E.G. O'Neill, N.T. Edwards, S.D. Wullschleger, A.W. King, W. M. Post,
T. J. Tschaplinski, C.A. Gunderson, and P.J. Hanson
Funding agency: National Science Foundation
Funding amount: $1,490,983
Funding period: FY1997-1999

Project title: A Free-air CO_2 exposure facility in a deciduous forest

R.J. Norby, N.T. Edwards, C.A. Gunderson, P.J. Hanson, A.W. King, E.G. O'Neill, W. M. Post, **T.J. Tschaplinski**, and S.D. Wullschleger
Funding agency: Laboratory Director's Research and Development
Funding amount: $760,000
Funding period: FY1996-1999

Project title: Biochemical mechanisms of ecosystem adjustments to altered precipitation (A component of the larger Mechanisms of Forest Ecosystem Adjustments to Altered Precipitation – The Walker Branch Throughfall Displacement Experiment (TDE) renewal proposal)
T.J. Tschaplinski, G.M. Gebre, and P.J. Hanson
Funding agency: DOE, Office of Biological and Environmental Research, Program for Ecosystem Research
Funding amount: $438,000
Funding period: FY1999-2002

Project title: Limits of drought tolerance of poplar
T.J. Tschaplinski, G.A. Tuskan, G.M. Gebre, and D.E. Todd
Funding agency: DOE, Biofuels Feedstock Development Program
Funding amount: $338,000
Funding period: FY1997-2000

Project title: Biochemical regulation of crown architecture in poplar
T.J. Tschaplinski, M. Cunningham, and H.D. Bradshaw
Funding agency: DOE, Office of Industrial Technology
Funding amount: $1,428,000
Funding period: FY1997-2001

Project title: Carbon allocation and partitioning in woody plants: A means to enhance bioenergy conversion and carbon sequestration.
G.A. Tuskan, S.D. Wullschleger, **T.J. Tschaplinski,** M.F. Davis, L.E. Gunter, and B.H. Davison
Sponsor: Lab Director's R&D
Funding amount: $793,000
Funding period: FY2000-2002

Project title: CRADA – Overcoming constraints to high-yield plantation-grown hardwoods in the southeastern United States
G.A. Tuskan, P.J. Hanson, **T.J. Tschaplinski**, and S.D. Wullschleger
Funding agency: DOE, Biofuels Feedstock Development Program
Funding amount: $1,300,000
Funding period: FY1996-2000

Project title: Biochemical mechanisms of drought tolerance of four deciduous species: Implications for forest succession - Renewal
T.J. Tschaplinski, C.A. Gunderson, D.E. Todd, and G.M. Gebre
Funding agency: DOE, Office of Health and Environmental Research, Program for Ecosystem Research
Funding amount: $414,000
Funding period: FY1997-1998

Project title: Biochemical mechanisms of drought tolerance of four deciduous species:

Implications for forest succession
T.J. Tschaplinski and C.A. Gunderson
Funding agency: DOE, Office of Health and Environmental Research, Program for Ecosystem Research
Funding amount: $550,000
Funding period: FY1994-1996
Project title: Ecological effects of UV-B radiation: Are indicators of DNA damage predictive of alterations in reproductive success in natural ecosystems?
L.R. Shugart, G.A. Tuskan, **T. J. Tschaplinski**, W. Hill, A. Stewart, S. Anderson, J.M. Grebmeier, and L.W. Cooper
Funding agency: DOE, Office of Health and Environmental Research, Program for Ecosystem Research
Funding amount: $500,000
Funding period: FY1995-1996

Project title: The biochemical basis of the decline in dark respiration and nitrogen concentration in trees growing under elevated CO_2
T.J. Tschaplinski and S.D. Wullschleger
Funding agency: "Seed Money" from the Laboratory Director's Research and Development Program
Funding amount: $80,000
Funding period: FY1994

Project title: CRADA – Biochemical basis of drought tolerance in hybrid *Populus* grown under field conditions
T.J. Tschaplinski, G.A. Tuskan, G.M. Gebre, and D.E. Todd
Funding agency: DOE, Biofuels Feedstock Development Program
Funding amount: $600,000
Funding period: FY1994-1996

Project title: Mechanisms of mycorrhizal constraint of forest ecosystem response to global climate
E.G. O'Neill, **T.J. Tschaplinski**, and R.V. O'Neill
Funding agency: DOE, Office of Health and Environmental Research, Program for Ecosystem Research
Funding amount: $604,148
Funding period: FY1993-1996

Project title: Advanced concepts for production and conversion of renewable plant
G.A. Tuskan, Y.C. Wang, and **T.J. Tschaplinski**
Funding agency: Laboratory Director's Research and Development Program
Funding amount: $720,000
Funding period: FY1992-1994

Project title: Biochemical and molecular bases of water stress tolerance in *Populus*
T.J. Tschaplinski and G.A. Tuskan
Funding agency: DOE, Biofuels Feedstock Development Program
Funding amount: $525,000
Funding period: FY1991-1993