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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. Most recent activities include characterizing the molecular basis of plant-microbe (bacterial and fungal) symbiotic relationships in contrast with pathogenic relationships.

POSITIONS

2019-present	**Section Head Biodesign & Systems Biology, Distinguished R&D Staff** Biosciences Division, Oak Ridge National Laboratory, Oak Ridge, TN
2007-2019	**Group Leader Metabolomics**, **Distinguished R&D Staff** Biosciences Division, Oak Ridge National Laboratory, Oak Ridge, TN
2004-present	**Joint Faculty ORNL Graduate Adviso**r 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 - 226 total (including 11 patents)

Saint-Vincent, P., A. Furches, S. Galanie, E. Teixeira-Prates, 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. (accepted)

Yao, T., J. Zhang, T. Yates, H. Shrestha, N.L. Engle, R. Ployet, J. Cai, K. Feng, W. Bewg, M. Chen, H. Lu, S. Harding, Z. Qiao, J. Sara, M. Shu, W. Yuan, K. Mozaffari, A. Harman-Ware, R. Happs, L. York, B. Binder, Y. Yoshinaga, C. Daum, T.J. Tschaplinski, P. Abraham, C.-J. Tsai, K. Barry, A. Lipzen, J. Schmutz, G.A. Tuskan, J.-G. Chen, and W. Muchero. 2023. eQTL mapping identified PtrXB38 as a key hub gene in adventitious root development in *Populus*. New Phytol. (accepted)

Simon, S., A. Furches, H. Chhetri, L. Evans, P. Jones, G. Wimp, D. Macaya-Sanz, D. Jacobson, T. Tschaplinski, G. Tuskan, S.P. DiFazio. 2023. Genetic underpinnings of arthropod community distributions in *Populus trichocarpa*. New Phytologist (accepted)

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

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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

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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

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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

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

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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

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PATENTS - 11 total

CA-2696438-C	The use of azelaic acid for priming a plant to induce a resistance response against a pathogen
US-2014182013-A1	Key gene regulating cell wall biosynthesis and recalcitrance in *Populus*, gene Y
US-2020102571-A1	Methods for controlling cell wall biosynthesis and genetically modified plants
US-10144938-B2	Methods of processing aromatic compounds
WO-2013093637-A2	Plant treatment methods and means therefore
AU-2014246584-B2	Plant pathogen resistance
US-2020325505-A1	Filamentous fungi capable of producing very long chain fatty acids
US-2021261993-A1	Microorganisms and methods for producing 2-pyrone-4,6-dicarboxylic acid and other compounds
US-2020399637-A1	Loss of function alleles of PtEPSP-TF and its regulatory targets in rice
US-11028404-B2	Methods of improving mycorrhization in plants and genetically modified plants with improved mycorrhization
US-2019136251-A1	Gene impacting cellulose content and biomass formation and methods of use

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

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 – 2022)
Current Metabolomics and Systems Biology - Editorial Board (2012 - 2022)
Scientific Reports (a Nature journal) Editorial Board (2019)
DOE-ARPA-E Phytosequestration Workshop (2015)
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

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