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Metabolomics and Bioconversion Group Leader
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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

2007-present	**Distinguished Research Staff**, Biosciences Division Oak Ridge National Laboratory, Oak Ridge, TN
2017-present	**Faculty Member** of the Bredesen Center for Interdisciplinary Research and Graduate Education, University of Tennessee, Knoxville, TN
2004-present	**Adjunct Faculty**, UT-ORNL Genome Science & Technology Graduate School University of Tennessee, Knoxville, TN
2003-present	**Adjunct Professor**, Department of Plant Sciences University of Tennessee, Knoxville, TN
2002-2006	**Senior Scientist**, Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, TN
1995-1997	**Adjunct Professor**, Institute of Agriculture University 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 - 153 total

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. 2109. Multi-trait genome-wide association analysis of *Populus trichocarpa* identifies key polymorphisms controlling morphological and physiological traits. New Phytologist (accepted)

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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

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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

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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. doi.org/10.1186/s13068-017-0998-3

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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. DOI: 10.1186/s13068-017-0960-4

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(NAA) to determine the elemental concentration in the ionome of the *Populus trichocarpa* leaf. Spectra Chimica Acta B: Atomic Spectroscopy 138:46-53 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.

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. DOI: 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. doi: 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. doi.org/10.1016/j.funeco.2017.03.001

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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.

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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

DOE-ARPA-E Phytosequestration Workshop (2015)
DOE-ARPA-E- Transportation Energy Resources from Renewable Agriculture (TERRA)- Workshop participant and Review Panel Member (2014)
Current Metabolomics - Editorial Board (2012 - present)
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)
Environmental and Experimental Botany – Editorial Board (2002 – present)
Tree Physiology – Editorial Review Board (1994 – present)
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