Yinan Yuan, Ph.D.

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RESEARCH INTERESTS

Antisense transcription of tree genome
Functionality of alternatively spliced transcripts in forest trees

EDUCATION

Ph.D. (2000), Chinese Academy of Agricultural Sciences, Beijing, China

PROFESSIONAL EXPERIENCE

04/2009-present: Research Assistant Professor, College of Forest Resources and Environmental Science, Michigan Technological University, Houghton, Michigan

08/2010-08/2017: Research Assistant Professor, Department of Chemistry, Michigan Technological University, Houghton, Michigan

01/2005-10/2008: Postdoc Research Scientist (Mentor, Dr. Chung-Jui Tsai), Biotechnology Research Center, School of Forest Resources and Environmental Science, Michigan Technological University, Houghton, Michigan

09/2000-12/2004: Postdoc Research Associate (Mentors, Dr. Jeffrey Bennetzen, Dr. Scott Jackson), Department of Biology and Department of Agronomy, Purdue University, West Lafayette, Indiana

03/1999-06/2000: Visiting Research Scholar/Visiting Graduate Student (Mentor, Dr. Pim Lindhout), Department of Plant Breeding, Wageningen University, the Netherlands

TECHNICAL SKILLS

Molecular biology and biochemistry skills: DNA and RNA extraction, gel electrophoresis, gene mutation, gene cloning, gene expression, PCR, DNA sequencing, enzymatic reactions and HPLC

Bioinformatic skills: Linux, R, AWK program languages, and RNA-seq and big genomic data analysis

MENTORING EXPERIENCE

College of Forest Resources and Environmental Science, Michigan Tech

Supervisor of Mr. Brandon Barkle, an undergraduate student in the Cheminformatics program in the Chemistry Department of Michigan Tech. Mentored Mr. Barkle on the project "Analysis of RNA-seq data with R packages". 2015

Supervisor of Mr. Nate Green, an undergraduate student in the Biochemistry and Molecular Biology program in the Chemistry Department of Michigan Tech. Mentored Mr. Green on the project "Over-expression, purification and characterization of a mutated DNA polymerase Phi29." 2013-2014

Supervisor of Mr. Philip Olivares, an undergraduate student in the Chemistry Department of Michigan Tech. Mentored Mr. Olivares on the project "Drought treatment of *Populus* plants." 2013

Supervisor of Ms. Stephanie Drake, an undergraduate student in the Department of Biomedical Engineering of Michigan Tech. Mentored Ms. Drake on the project "Transgenic *Arabidopsis* analysis with *PtICS* gene." 2007-2008

Supervisor of Mr. Mehreteab Mengsteab, an undergraduate student in Grand Rapids Community College. Mentored Mr. Mengsteab on the project" Characterization of Populus *ICS*." 2006

Department of Biology, Purdue University

Supervisor of Ms. Deborah Groth, an undergraduate student in the Department of Biology of Purdue University. Mentored Ms. Groth on the project "Cloning and sequencing the rht1 and sd1 orthologues from 31 tef accessions collected from various regions in Ethiopia." 2001-2003

PUBLICATIONS (* indicates I am the corresponding author)

1. **Yuan Y***, Chen C (2018) Widespread Antisense Transcription of *Populus* Genome under Drought. *Molecular Genetics and Genomics* 293(4): 1017-1033.
2. Fueangfung S, **Yuan Y**, Fang S (2014) Denaturing Reversed-Phase HPLC Using a Mobile Phase Containing Urea for Oligodeoxynucleotide Analysis. *Nucleosides, Nucleotides and Nucleic Acids* 33: 481-488.
3. Pokharel D, **Yuan Y**, Fueangfung S, Fang S (2014) Synthetic Oligodeoxynucleotide Purification by Capping Failure Sequences with a Methacrylamide Phosphoramidite Followed by Polymerization. *RSC Advances* 4: 8746–8757.

4. Xue L-J, Guo W, **Yuan Y**, Anino EO, Nyamdari B, Wilson MC, Frost CJ, Chen H-Y, Babst BA, Harding SA, Tsai CJ (2013) Constitutively Elevated Salicylic Acid Levels Alter Photosynthesis and Oxidative State but not Growth in Transgenic *Populus*. *Plant Cell* 25: 2714-2730.

5. Fang S, Fueangfung S, **Yuan Y** (2012) Purification of Synthetic Oligonucleotides via Catching by Polymerization. In *Current Protocols in Nucleic Acid Chemistry* (Martin Egli, Piet Herdewijn, Akira Matusda,Yogesh S. Sanghvi, eds.). John Wiley and Sons, New York, Unit 10.14.1-10.14.21.

6. **Yuan Y**, Fueangfung S, Lin X, Pokharel D, Fang S (2012) Synthetic 5′-Phosphorylated Oligodeoxynucleotide Purification through Catching Full-length Sequences by Polymerization. *RSC Advances* 2: 2803-2808.

7. Tsai CJ, Guo W, Babst B, Nyamdari B, **Yuan Y**, Payyavula R, Chen HY, Xue L, Tay K, Michelizzi V and Harding SA (2011) Salicylate metabolism in *Populus*. *BMC Proceedings* 5, I9.

8. **Yuan Y**, Chung J-D, Fu X, Johnson VE, Ranjan P, Booth SL, Harding SA, Tsai C-J (2009) Alternative Splicing and Gene Duplication Differentially Shaped the Regulation of Isochorismate Synthase in *Populus* and *Arabidopsis*. *Proceedings of the National Academy of Sciences USA* 106: 22020-22025.

9. Bennetzen, JL, Smith SM, **Yuan Y**, Groth D (2009) Comparative Plant Biology: Opening New Avenues for the Improvement of Orphan Crops in a Time of Rapid and Potentially Catastrophic Change in Worldwide Agriculture. In: Z. Tadele, ed., *New Approaches to Plant Breeding of Orphan Crops in Africa: Proceedings of an International Conference*. University of Bern, Stampfli AG, Bern, pp. 11-20.

10. Tsai C-J, Harding SA, Tschaplinski TJ, Lindroth RL, **Yuan Y** (2006) Genome-wide Analysis of the Structural Genes Regulating Defense Phenylpropanoid Metabolism in *Populus*. *New Phytologist* 172: 47-62.

11. Chan AP, Pertea G, Cheung F, Lee D, Zheng L, Whitelaw C, Pontaroli AC, SanMiguel P, **Yuan Y**, Bennetzen J, Barbazuk WB, Quackenbush J, Rabinowicz PD (2006) The TIGR Maize Database. *Nucleic Acids Research* 34 (Database issue): D771-776.

12. Emberton J, Ma J, **Yuan Y**, SanMiguel P, Bennetzen JL (2005) Gene Enrichment in Maize with Hypomethylated Partial Restriction (HMPR) Libraries. *Genome Research* 15(10): 1441-1446.

13. Lin, J-Y, Hass-Jacobus B, SanMiguel P, Walling JG, **Yuan Y**, Shoemaker RC, Young ND and Jackson SA (2005) Molecular and Cytogenetic Characterization of Gene-poor, Heterochromatic Regions of Glycine max *L. Merr. Genetics* 170: 1221-1230.

14. Whitelaw CA, Barbazuk WB, Pertea G, Chan AP, Cheung F, Lee Y, Zheng L, van Heeringen S, Karamycheva S, Bennetzen JL, SanMiguel P, Lakey N, Bedell J, **Yuan Y**, Budiman MA, Resnick A, Van Aken S, Utterback T, Riedmuller S, Williams M, Feldblyum T, Schubert K, Beachy R,

Fraser CM, Quackenbush J (2003) Enrichment of Gene-coding Sequences in Maize by Genome Filtration. *Science* 302: 2118-2120.

15. **Yuan Y**, SanMiguel P and Bennetzen J (2003) High Cot Sequence Analysis of the Maize Genome. *Plant Journal* 34 (2): 249-255.

16. **Yuan Y**, SanMiguel P. and Bennetzen J (2002) Methylation-Spanning Linker Libraries Link Gene-rich Regions and Identify Epigenetic Boundary in Zea mays. *Genome Research* 12: 1345-1349.

17. **Yuan Y**, Hanstra J, Lindhout P and Bonnema G (2002) *Cf-ECP3*, a New *Cladosporium fulvum* Resistance Gene in Tomato, Is Part of the Orion Cluster on the Short Arm of Chromosome 1. *Molecular Breeding* 10: 45-50.

18. **Yuan Y**, Bonnema G, Hasnstra J, Du Y, Zhu D, Lindhout P (2000*) Cf-ECP3*, a New *Cladosporium Fulvum* Resistance Gene In Tomato, Is Part of the Orion Cluster on the Short Arm of Chromosome 1. *Proceedings of International Symposium on Biotechnology Applications in Horticultural Crops*. pp-112.

19. **Yuan Y**, Zhu D, Lian Y, Dai S, Lu C (2000) Cytological Studies on the Tomato Microspore Development in Male Sterile Mutant 95305. *Journal of Huabei Agricultural Sciences* 15 (3): 61-65.

20. **Yuan Y**, Zhu D Lian Y, Dai S (1999) Production of Embryoids and Calli from Isolated Microspores of Tomato in Liquid Medium. *Journal of Agricultural Biotechnology* 1: 85- 88.

PRESENTATIONS

1. Fueangfung S, **Yuan Y**, Pokharel D, Lin X, Fang S. Synthetic 5′- Phosphorylated Oligodeoxynucleotide Purification Through Catching Full-Length Sequences by Polymerization. Fall 2014 Biotechnology Research Center Graduate Student Research Forum, Michigan Technological University, Houghton, MI, October 22-23, 2014.

2. Fang S, Lin X, Pokharel D, Fueangfung S, **Yuan Y**. Catching-by-polymerization for Synthetic Oligodeoxynucleotide Purification and Oxidatively Cleavable Protecting Groups and Linkers for Electrophilic Oligodeoxynucleotide Synthesis. Nucleosides, Nucleotides and Oligonucleotides Gordon Research Conference, Salve Regina University, Newport, RI, June 30 – July 5, 2013.

3. Fang S, Fueangfung S, Pokharel D, Lin X, **Yuan Y**. Purification of Synthetic Oligodeoxynucleotides Using a Catching by Polymerization Approach. The 245th ACS National Meeting & Exposition, New Orleans, LA, United States, April 7-11, 2013.

4. **Yuan Y**. Alternative Splicing and Natural Antisense Transcription in *Populus.* Department of Chemistry, Michigan Technological University, 2008.

5. **Yuan Y**. Molecular Cloning and Characterization of *Isochorismate Synthase (ICS)* Involved in the Biosynthesis of Salicylates and Phenolic Glycosides in *Populus.* Biotechnology Research Center, Michigan Technological University, 2007.

6. **Yuan Y**, SanMiguel P, Bennetzen J. Gene-enrichment Technologies Sequence Analysis of the Maize Genome. Plant and Animal Genomics X. Town and Country Hotel, San Diego, CA, 2003.

7. **Yuan Y**, SanMiguel P, Bennetzen J. New and Old Approaches to Selective Sequence Analysis of Gene-Containing Regions of the Maize Genome. Plant, Microbe and Animal Genomics X. Town and Country Hotel, San Diego, CA, 2002.

8. **Yuan Y**, Bonnema G, Hasnstra J, Du Y, Zhu D, Lindhout P. Cf-ECP3, a New *Cladosporium fulvum* Resistance Gene in Tomato, Is Part of the Orion Cluster on the Short Arm of Chromosome 1. International Symposium on Biotechnology application in Horticultural Crops. Beijing, China, September, 4-8, 2000.

RESEARCH GRANT SUPPORT

1. MTU Research Excellence Fund (REF): Genome-Wide Analysis of Regulatory RNAs Associated with Wood Formation in *Populus*; $15,000; 07/14 -08/15; PI: **Yinan Yuan**.

2. USDA NIFA AFRI: Systematic Identification and Characterization of Overlapping Sense/Antisense Gene Loci in *Populus* Genome; $149,888; 04/15/2012 to 04/14/2016; PD: Dr**. Yinan Yuan**; Co-PD: Dr. HairongWei.

3. NSF IDBR EAGER: An AFM-Based Instrument for Monitoring DNA Synthesis in Real-Time; $200,000; 05/01/2012-04/30/2015; PI: Dr. Shiyue Fang; co-PI: Dr. **Yinan Yuan**; co-PI: Dr. Reza Shahbazian-Yassar.

4. NASA Michigan Space Grant Consortium: A Sequencing Technology Capable of Monitoring Variations of DNA Methylation Induced by Travel in Space; $2,500; 05/01/2013- 04/30/2014; PI: Dr. Shiyue Fang; co-PI: Dr. **Yinan Yuan**.

PROFESSIONAL SERVICE

Judge, Undergraduate Research Expo, BRC, Michigan Technological University, March 22nd, 2013
Judge, Student Research Forum, Michigan Technological University, March 27th, 2013
Judge, Graduate Research Colloquium, Michigan Technological University, February 21st, 2014
Judge, Undergraduate Research Expo, Michigan Technological University, March 21st, 2014
Judge, Biotechnology Research Center (BRC) Student Research Forum, Michigan Technological University, March 19th, 2014
Member, LSTI Travel Grant Committee, 2014-2017
Member, USDA NIFA Review Panel, 2014

Member, USDA NIFA Review Panel, 2015
Reviewer, African Journal of Agricultural Research, 2012
Reviewer, Acta Physiologiae Plantarum, 2018