

**BRIAN G. AYRE, BSc/PhD**

August 29, 2005

University of North Texas, Department of Biological Sciences

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**Academic Appointments****Assistant Professor**, University of North Texas, Department of Biological Sciences.

Aug. 2003 – Present. Research interests: Long-distance signaling in plants, biomass partitioning, metabolic engineering, phloem function and development.

**Courses:** Topics in Plant Biology (Biol 5680), Fall semester  
 Plant Physiology and Biochemistry (Bioc 6650), Fall, alternate years  
 Plant Physiology (Biol 4005/5005), Spring semester  
 Principles of Biology (Biol 1720), Spring, alternate years

**Mentoring** (current and former laboratory personnel): two postdoctoral scholars, three graduate students, five undergraduate students, two Texas Academy of Math and Sciences (TAMS) students

**Education and Research History****Postdoctoral Research Associate**, Cornell University, Department of Plant Biology.

Sept. 1998 – July 2003. Projects: Phloem transport of photoassimilates and foreign sugars, genetic regulation of phloem structure and function. Trained and supervised seven undergraduate assistants and two technical assistants; advised two graduate students and a visiting Professor. Principal Investigator: Robert Turgeon.

**Postdoctoral Fellow**, Medical Research Council Laboratory of Molecular Biology, Cambridge, UK. Sept. 1995 - Sept. 1998. Project: Develop *trans*-splicing group I intron ribozymes for anti-viral therapies in plant and yeast model systems. Principal Investigator: Jim Haseloff.**PhD, Plant Molecular Biology and Biotechnology**, University of Alberta.Sept. 1989 - Sept. 1995. Thesis Title: *Analysis of the efficacy of using hammerhead ribozymes to control gene expression in higher plants*. Principal Advisor: Aladar A. Szalay.**BSc (Honors), Genetics Program**, University of Manitoba.

Sept. 1985 - Apr. 1989. Emphasis on classical, population, and molecular genetics.

**Funding, Fellowships, and Awards: Federal****National Science Foundation**, Integrative Plant Biology, IBN-0344088, **The Efficiency of Long-Distance Translocation: Retention Properties of Sugars in the Transport Phloem**. Ayre BG, sole investigator, awarded \$390,000, April 2004 – Mar 2007.**United States Department of Agriculture**, National Research Initiative Competitive Grants Program, USDA NRI CGP #2001-03391, **Phloem loading and the sink-to-source**

**transition: Genetic regulation.** Prepared with and submitted by Robert Turgeon, Cornell University, awarded \$113,000, Sept. 2001 - Aug. 2003.

### **Funding, Fellowships, and Awards: Internal**

UNT Faculty Research Grant, Sept. 2004 – Aug. 2005

UNT Junior Faculty Summer Research Fellowship, May 2004 – Aug. 2004

UNT Faculty Research Grant, Jan. 2004 – Aug. 2004

### **Publications**

**Ayre BG, Turgeon R** (2005) Florigen and a genetic approach to long-distance signaling through the phloem. *In* L Taiz and E Zeiger, eds, *Plant Physiology Online, a Companion to Plant Physiology, Third Edition*. Sinauer Associates, Sunderland, www.plantphys.net, In Press.

**Ayre BG, Turgeon R** (2005) Pathways and Mechanisms in Phloem Loading. *In* NM Holbrook, MA Zwieniecki, and PJ Melcher, eds, *Vascular Transport in Plants*. Elsevier Inc., San Diego, In Press.

**Ayre BG, Turgeon R** (2004) Graft transmission of a floral stimulant derived from *CONSTANS*. *Plant Physiology*; **135**: 2271-2278.

**Ayre BG, Blair J, Turgeon R** (2003) Functional and phylogenetic analysis of a conserved regulatory program in phloem of minor veins. *Plant Physiology*; **133**: 1229-1239.

**Ayre BG, Keller F, Turgeon R** (2003) Symplastic continuity between companion cells and the translocation stream: long-distance transport is controlled by retention and retrieval mechanisms in the phloem. *Plant Physiology*; **131**: 1518-1528.

**Ayre BG, Köhler U, Turgeon R, Haseloff J** (2002) Optimization of *trans*-splicing ribozyme efficiency and specificity by *in vivo* genetic selection. *Nucleic Acids Research*; **30**: e141.

**Heritatos E, Ayre BG, Turgeon R** (2000) Identification of phloem involved in assimilate loading in leaves by expression from a galactinol synthase promoter. *Plant Physiology*; **123**: 929-938.

**Ayre BG, Köhler U, Goodman HM, Haseloff J** (1999) Design of highly specific cytotoxins by using *trans*-splicing ribozymes. *Proceedings of the National Academy of Science of the United States of America*; **96**: 3507-3512.

**Köhler U, Ayre BG, Goodman HM, Haseloff J** (1999) *Trans*-splicing ribozymes for targeted gene delivery. *Journal of Molecular Biology*; **285**: 1935-1950.

**Wang G, Ayre B, Giacomani L, Mayerhofer R, Escher A, Langridge WHR, Szalay AA** (1994) Low light image analysis of transgenic organisms using bacterial luciferase as a marker. *Photochemistry and Photobiology*; **59**: 102S.

**Langridge WHR, Escher A, Wang G, Ayre B, Fodor I, Szalay AA** (1994) Low-light image analysis of transgenic organisms using bacterial luciferase as a marker. *Journal of Bioluminescence and Chemiluminescence*; **9**: 185- 200.

**Ayre BG, Escher A, Szalay AA** (1993) Bioluminescence as a measure of ribozyme activity *in vivo*. *Bioluminescence and Chemiluminescence Status Report: Proceedings of the VIIth International Symposium on Bioluminescence and Chemiluminescence*: 109-112.

**Kunz BA, Ayre BG, Downes AMT, Kohalmi SE, McMaster CR, Peters MG** (1989) Base-pair substitutions alter the site-specific mutagenicity of UV and MNNG in the SUP4-o gene of yeast. *Mutation Research*; **226**: 273-278.

### **Presentations (5 years)**

**Ayre BG, Turgeon R** (2004) Graft transmission of a floral stimulant derived from *CONSTANS*. Plasmodesma 2004, Pacific Grove, California. Oral Presentation.

**Ayre BG, Turgeon R** (2004) Long-distance signaling in plants: Graft transmission of a floral stimulant derived from *CONSTANS*. Annual meeting of the American Society for Plant Biologists. Orlando, Florida, USA. Poster Presentation.

**Ayre BG, Turgeon R** (2004) Long-distance signaling in plants: Graft transmission of a floral stimulant derived from *CONSTANS*. Annual meeting of the Southern Section of the American Society for Plant Biologists. Lafayette, Louisiana, USA. Poster Presentation.

**Ayre BG** (2003) From here to there: Gene regulation and long-distance transport of metabolites and signals in the phloem of plants. Research seminar presented at five universities, including UNT, during interviews for faculty positions. Oral presentation.

**Ayre BG, Turgeon R** (2002) Phloem loading and the regulation of gene expression in minor veins. *Workshop of Leaf Development*, hosted by Juan March Institute for Study and Research, Madrid, Spain. Poster Presentation.

**Ayre BG, Turgeon R** (2001) What do kidneys and minor-vein phloem have in common? Evidence for selective reclamation of essential metabolites from sieve elements. *Plant Biology 2001: The Annual Meeting of the American Society of Plant Biologists*; Abstract 935. Poster Presentation.

### **Professional Peer Review**

Peer review of original research manuscripts submitted to leading scientific journals: *Plant Physiology*, *The Plant Journal*, and *Plant Molecular Biology*.

Peer review of research proposals submitted to the National Science Foundation for funding

### **Professional Membership**

American Society of Plant Biologists (ASPB)

American Association for the Advancement of Science (AAAS)