

ARON L. SILVERSTONE, PhD, PMP

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Skills and Expertise

R&D leader experienced in biotechnology and crop protection product development. Diverse scientific and project management background including transgenic crop development from research through commercialization, research and development on plant enzymes and biochemistry.

Professional Experience

AgStone Research, LLC – Durham, NC

Consultant, 02/2023 - present

- Plant biotechnology, biochemistry and enzymology, agriculture

Syngenta Crop Protection, LLC – Greensboro, NC

Technical Leader Residue Science, Human Safety 11/2020 – 02/2022

- Led team of scientists overseeing residue studies for regulatory submissions in US and Canada.
- Supported the product development of new active ingredients and expand the use of registered pesticides.
- Interacted with regulatory and marketing colleagues to identify opportunities for robust product performance.
- Improved efficiency of internal processes.
- Served on leadership teams to ensure Residue Science perspective contributes to strategic decisions.

North America Lead Product Safety Operations 1/2019 – 10/2020

- Led team of specialists supporting 100+ Product Safety scientists for budgeting, outsourcing, document management, knowledge management and lab management
- Ensured alignment with global Product Safety practices.
- Developed projects to improve efficiency of the Product Safety group.

North America Product Biology Lead, Abiotic Stress Management, 6/2014 – 12/2018

- Oversaw field trial program to test products for performance in mitigating yield loss from abiotic stresses.
- Designed trials and testing methods to identify crop enhancement benefits from fungicides.
- Worked with field scientists on protocol design and data analysis.

- Ensured product availability for field and greenhouse testing.
- Updated planning tools.
- Interfaced with product marketing and assets teams.

Syngenta Seeds – RTP, NC

Global Project Manager, Soybean Traits 7/2010 – 5/2014

Herbicide-Tolerant Soybean

- Executed development project for a next generation HPPD-tolerant soybean.
- Managed multifunctional project team including field biology, regulatory, product safety, marketing, IP and legal.
- Coordinated between Seeds and Crop Protection projects.
- Oversaw co-development project with Bayer Crop Science.

Insect Control Soybean

- Directed development of a novel insect control trait stack for the LATAM market.
- Managed multifunctional project team.
- Activities included coordinating lab studies, field activities, IP, product safety and regulatory, and marketing.
- Led effort to develop a software tool that simulates Event Selection and Trait Introgression for soybean for use in scenario testing and decision analysis.

Syngenta Biotechnology, Inc. – RTP, NC

Senior Project Leader 4/2007 – 6/2010

- Developed technologies to enhance our abilities to express heterologous proteins in plants.
- Worked with internal research team, 3rd party collaborators and licensing opportunities.

Project Leader 6/2003 – 3/2007

Raw Starch Project

- Led research team and was project manager to develop next generation starch to ethanol technology.
- Managed effort to discover and validate novel enzymes with external collaborator.
- Generated and analyzed transgenic plants expressing novel starch hydrolytic enzymes.
- Managed coordination with Trait Introgression, Product Safety, Regulatory and IP teams.

Golden Rice Project

- Developed technical strategy to generate, characterize, and select lead events for an improved Golden Rice (high beta-carotene rice).
- Identified events with up to 20-fold higher beta-carotene than original Golden Rice.
- Golden Rice lead events were donated to the Humanitarian Board for oversight and product development.

Enogen Project

- Led research team supporting the corn starch to ethanol project.
- Designed and analyzed lab experiments, fermentation trials, ethanol pilot plant trials, and field trials.
- Collaborated with 3rd party ethanol producers

Staff Scientist II, 2/2001 – 5/2003

- Discovered and validated seed-specific promoters.
- Worked with external collaborator to enhance soybean for animal feed.

Staff Scientist I, 6/1999 – 1/2001

- Designed and built constructs to overexpress sweet protein in corn.
- Analyzed transgenic events.

Developmental, Cell and Molecular Biology Group, Department of Botany, Duke University
Postdoctoral Fellow, 4/1994 – 5/1999

- Conducted research on the biosynthesis and signal response pathway of the plant hormone gibberellin in the model plant Arabidopsis.
- Discovered that key steps in GA signaling involved the degradation of repressor proteins.
- Identified cellular locations of early steps of GA biosynthesis throughout plant development.

Department of Vegetable Crops, University of California, Davis
Research Associate, 8/1987 – 3/1994

- Performed research on the biosynthesis of the plant hormones ethylene and auxin.
- Identified novel enzymes and metabolic reactions in plants.

Education and Professional Training

University of California, Davis, Ph.D., Plant Physiology 1994
 Harvard College, A.B., *magna cum laude*, Biology 1987

Leadership Effectiveness Program UNC Kenan-Flagler Business School 2021
 Foundations of Advocacy Training Syngenta Product Safety, 2020
 GLP Training Syngenta Quality Assurance Unit, 2020
 Manager of Managers Pathway Program, Kincentric, 2019-2020
 MSP (Managing Successful Programmes, Registered Practitioner), 2012
 Project Management Professional (PMP) Certification, Project Management Institute 2009
 ALPS (Agribusiness Leadership Plus at Purdue), 2003-2004
 Managing Innovation in Agribusiness Program, UNC-Chapel Hill, 2001

Invited Talks

RTP 180, Research Triangle Park, NC (2019)
 Shanxi Normal University, Linfen, China (2018)
 International Plant Growth Substances Association Meeting, Toronto, Canada (2016)
 Annual Meeting of the Plant Pathology Society of North Carolina, RTP, NC (2010)
 Frontiers in Transgenesis, Donald Danforth Plant Science Center, Creve Coeur, MO (2007)
 Crop Improvement for Human Health, MSU (2005)
 North Carolina Plant Molecular Biology Consortium, 14th Annual Retreat (2000)

ASPB Annual Meeting, Baltimore, MD (1999)
 Plant Gene Expression Center, USDA, Albany, CA (1999)
 University of North Carolina, Chapel Hill (1999)
 University of California, Riverside (1999)
 RIKEN (Saitama, Japan) Frontiers of Gibberellin Research, Part V (1998)
 Wake Forest University (1998)
 North Carolina Plant Molecular Biology Consortium, 11th Annual Retreat (1997)
 RIKEN (Saitama, Japan) Frontiers of Gibberellin Research, Part III (1995)
 Duke University: Developmental, Cell and Molecular Biology Group (1994)

Honors

Rising Sun Award, 16th International Conference on Plant Growth Substances, 1998
 Jastro-Shields Research Fellowship, 1991-1992
 McKnight Foundation Fellow, 1987-1989

Teaching Experience

Biotechnology Seminar class (Bio 280S) guest lectures, Fall 2002 – present, Duke University
 Graduate Careers Class, panel discussion, 2014 to 2021, Duke University
 Graduate Class Bio Bootcamp, panel discussion, 2017 to 2021, Duke University
 Biotechnology Seminar class (Bio 195S.01) guest lectures, Fall 2001 - 2017, Duke University
 Biotechnology Seminar class (Bio 199) guest lectures, Fall 1999, 2000, Duke
 Developmental Biology lab class (Bio 185), guest lectures, Fall 1997, Duke
 Molecular Basis for Plant Growth and Development, guest lectures, Spring 1997, Duke
 Supervised Independent Study Undergraduates (16), Summer 1994-1999, Duke
 Introductory Biology 1C Lab. (Plants, Fungi, Algae), Spring 1992, Spring 1993
 Supervised Independent Study Undergraduate (1), Fall 1991-Spring 1992

Publications

Azhakanandam K, **Silverstone A**, Daniell H, Davey MR, eds. (2015) *Recent Advancements in Gene Expression and Enabling Technologies in Crop Plants*. Springer.

Silverstone AL, Tseng T-S, Swain SM, Dill A, Joeng SY, Olszewski NE and Sun T-p (2007) Functional analysis of SPINDLY in gibberellin signaling in Arabidopsis. *Plant Physiol.* 143:987-1000.

Paine JA, Shipton CA, Chaggar S, Howells RM, Kennedy MJ, Vernon G, Wright SY, Hinchliffe E, Addams JL, **Silverstone AL** and Drake R (2005) Improving the nutritional value of Golden Rice through increased pro-vitamin A content. *Nat. Biotech.* 23: 482-487.

Silverstone AL, Jung H-S, Dill A, Kawaide H, Kamiya Y, and Sun, T-p (2001) Repressing a repressor: Gibberellin-induced rapid reduction of the RGA protein in Arabidopsis. *Plant Cell* 13: 1555-1565.

Sun T-p and **Silverstone AL** (2000) Gibberellins and the green revolution. *Trends Plant Sci* 5:1-2.

- Silverstone AL**, Ciampaglio CN, and Sun, T-p (1998). The Arabidopsis *RGA* locus encodes a transcriptional regulator repressing the gibberellin signal transduction pathway. *Plant Cell* 10:155-169.
- Silverstone AL**, Mak PYA, Casamitjana Martínez E, and Sun T-p (1997). The new *RGA* locus encodes a negative regulator of gibberellin response in *Arabidopsis thaliana*. *Genetics* 146: 1087-1099.
- Silverstone AL**, Chang C-W, Krol E, and Sun T-p (1997). Developmental regulation of the gibberellin biosynthetic gene *GAI* in *Arabidopsis thaliana*. *Plant J.* 12:9-19.
- Wu YM, **Silverstone AL**, Liu Y, and Yang SF (1995) Partial purification and characterization of tryptophan malonyltransferase from tomato leaves. *Phytochem.* 40:699-704.
- Liu Y, **Silverstone AL**, Wu YM, and Yang SF (1995) Formation of *N*-malonyl-L-tryptophan in water stressed tomato leaves. *Phytochem.* 40:691-697.
- Dong JG, Olson D, **Silverstone AL**, and Yang SF (1992) Sequence of a cDNA coding for a 1-aminocyclopropane-1-carboxylate oxidase homolog from apple fruit. *Plant Physiol.* 98:1530-1531.
- Kim WT, **Silverstone AL**, Yip WK, Dong JG, and Yang SF (1992) Induction of 1-aminocyclopropane-1-carboxylate synthase mRNA by auxin in cultured apple shoots and mungbean hypocotyls. *Plant Physiol.* 98:465-471.
- Einset JW and **Silverstone AL** (1987) Hydroxylation of N⁶-(Δ^2 -isopentenyl)adenine to zeatin. *Plant Physiol.* 84:208-209.

Patents

- US Patent 9,125,357 (2015). Methods for the commercial production of transgenic plants. Kenneth A. Dallmier, Rene Quadt, **Aron Silverstone**
- US Patent 8,343,747 (2013). *Amylases and glucoamylases*, nucleic acids encoding them and methods for making and using them. Ellen Burke, Michelle H. Cayouette, Cathy Chang, Majid Ghassemian, Uvini Gunavardena, Geoff Hazlewood, Peter Luginbuhl, **Aron Silverstone**, Malgorzata Slupska, Yan Zhang
- US Patent 8,124,841 (2012). Truncation of the C-terminal end of alpha-amylase. Andrew DeBrecht, **Aron Silverstone**, Yan Zhang, Shengsheng Zhang, Xuejun Zhong
- US Patent 7,914,993 (2011). Process for starch liquefaction and fermentation. Christopher J. Batie, Greg Crabb, George W. Aux, Edward S. Cates, Jay Austin Dinwiddie, **Aron Silverstone**, Rene Quadt, Carl A. Miller