November 30, 2024

**ELEANORE T. WURTZEL, Ph.D.**
**Professor and Chair**
Department of Biological Sciences, Lehman College and The Graduate Center
The City University of New York, 250 Bedford Park Blvd. West, Bronx, New York 10468
**WEB:** https://guest-fo41m2y.owlstown.net/
**GOOGLE SCHOLAR CITATIONS:** https://scholar.google.com/citations?hl=en&user=JpL_f2IAAAAJ&view_op=list_works

## HIGHLIGHTS

**RESEARCH:** The Wurtzel laboratory conducts research on provitamin A carotenoid biosynthesis which is enabling sustainable solutions to combat vitamin A deficiency, the cause of blindness and increased mortality in 250 million children worldwide. This research revealed pathway control points to enable breeding of high-provitamin A maize. The Wurtzel lab also discovered Z-ISO, a crucial enzyme for carotenoid biosynthesis. This breakthrough led to discovery of a new prototype function for heme proteins, uncovered a novel means for regulating carotenoid biosynthesis, and redefined the carotenoid biosynthetic pathway in all plants and algae. Over 100 undergraduate, high school, graduate students and postdoctoral scientists (*30% under-represented; 47% women*), have trained in the Wurtzel lab. Dr. Wurtzel has secured ~$8 million in funding, including >25 years of continuous funding from the *NIH*, 8 years funding from the *Rockefeller Foundation* International Rice Biotechnology program, has published in many high impact journals, holds several patents, and has served in numerous advisory roles.

**STRATEGIC LEADERSHIP IN EMERGING FIELDS** (*representative activities*): Dr. Wurtzel is active in promoting diversity in the scientific community, expanding opportunities for young scientists and facilitating growth of emerging fields of science. Dr. Wurtzel contributed to scientific planning with the Rockefeller Foundation for what later became known as *"Golden Rice,"* a sustainable solution to vitamin A deficiency in the rice-eating world. Dr. Wurtzel later served as advisor for the provitamin A carotenoid improvement program "BioCassava Plus" funded by the Gates Foundation. In only one year during the pandemic (2022), Dr. Wurtzel completed three volumes of *Methods in Enzymology on Carotenoids*, with contributions from 55 carotenoid laboratories worldwide, including 193 authors, which is supporting emerging areas of carotenoid research. Dr. Wurtzel served as Vice Chair and Chair of the *Gordon Research Conference* (*GRC) on Carotenoids* and founded the *GRS Seminar on Carotenoids* (2013) for early career scientists. In addition to founding the *GRC on Plant Metabolic Engineering*, Dr. Wurtzel established the associated *GRS Seminar* for early career scientists. Dr. Wurtzel organized a *Banbury meeting* at *Cold Spring Harbor Laboratory* to discuss the potential of applying synthetic biology as a second "Green Revolution" to solve global food demands, which led to a widely read Perspective article in *Nature Plants*. Dr. Wurtzel advised on strategic planning, biology, and chemistry while serving on the *GRC Board of Trustees* and conference evaluation committee. Dr. Wurtzel was a Monitoring Editor for the ASPB journal, *Plant Physiology*, and is an Editor-in-Chief for *Plant Science*. Dr. Wurtzel also serves on the *Gordon Research Conference advisory committee* to support diversity in STEM. Dr. Wurtzel has served on the ASPB Women in Plant Biology and Minority Affairs committees.

**AWARDS:**

**2023**: Received the **Trevor Goodwin Award** in Japan for lifetime achievement in carotenoid biochemistry, the first USA scientist and woman to do so.

**2017**: Honored as **ICS Fellow** in Switzerland for excellence, leadership, and ethics.

**2016**: Invited member, **ASPB Legacy Society** of top researchers in plant biology

**2012**: Awarded **ASPB Fellow** for distinguished contributions to plant biology.

**2006**: Elected **AAAS Fellow** for pioneering research on provitamin A carotenoid biosynthesis

## RESEARCH IMPACT

My laboratory has had a long-standing research program on provitamin A carotenoid biosynthesis to enable development of sustainable solutions to global vitamin A deficiency. This research has facilitated breeding of vitamin A-rich maize for Africa, supported development of Golden Rice for Asia and vitamin A-rich Cassava for Africa and South America.

### DATA ON PAPERS & PATENTS (1987-2024)*

| | |
|---|---|
| Manuscripts and books | 86 |
| # citations | >7000 |
| # papers with >200 citations | 12 |
| # citations for highest citation paper | ~1000 |
| Patents/Patent applications | 2/9 |

***GOOGLE SCHOLAR CITATIONS:** *https://scholar.google.com/citations?hl=en&user=JpL_f2IAAAAJ&view_op=list_works*

### DATA ON TALKS & POSTERS (1987-2024)

| | |
|---|---|
| Invited talks | 95 |
| Poster presentations | 133 |

### DATA ON RESEARCH TRAINEES (1987-2024)

***Over 100** undergraduate, high school, graduate students and postdoctoral scientists (**30% under-represented; 47% women**) trained in the Wurtzel lab.*

| **Level** | **Postdocs & Visiting Scientists** | **Graduate Students** | **Undergraduate Students*** | **High School Students** |
|---|---|---|---|---|
| Total | 29 | 34 (18 PhD 16 Masters) | >32 | 2 |
| Coauthors on peer-reviewed **MANUSCRIPTS** | 31 | 58 | 7 | 0 |
| Co-authors on **PATENTS** | 2 | 7 | 0 | 0 |
| Co-authors on meeting **POSTERS** | 70 | 175 | 57 | 1 |
| Underrepresented (%) | 3 (10%) | 7(21%) | 18 (56%) | 1 (50%) |
| Women | 13 (45%) | 15 (44%) | 16 (50%) | 2 (100%) |

*not included were many volunteers and work-study students who assisted in the lab; for over 20 years, at least 5-8 students joined the lab to work as lab assistants and in the maize genetics field.

### RESEARCH PUBLISHED IN HIGH IMPACT JOURNALS (a subset of all papers)

| **Journal Name** | **Impact Factor** | **Number of published papers** |
|---|---|---|
| **Chemical Reviews** | 49.8 | **1** |
| **Science** | 31.5 | **2** |
| **Proc. Nat. Acad. Sci., USA** | 11.2 | **1** |
| **The Plant Cell** | 10.0 | **2** |
| **Nature Plants** | 8.6 | **1** |
| **Nature Chemical Biology** | 7.6 | **1** |
| Frontiers in Plant Science | 6.6 | 1 |
| Journal of Experimental Botany | 5.8 | 3 |
| Journal of Agricultural and Food Chemistry | 5.8 | 1 |
| Plant Physiology | 5.6 | 10 |

**EDUCATION:**

1976 B.S. Biochemistry, SUNY Stony Brook
1982 Ph.D. Molecular Biology, Biochemistry Dept., SUNY Stony Brook

**APPOINTMENTS:**

**Lehman College, The City University of New York** (1987-present):
-Full Professor (1/2001- present); Associate Professor (1993-2000); Asst. Professor (2/1/1987-1993), tenured 1/92)
-Elected Chair, Dept. of Biological Sciences (July 1, 2022-June 30, 2025)
-Graduate Advisor (MS/MA) Lehman College (July 1, 2019-June 30, 2022)
-Chair, CUNY Ph.D. subprogram in Plant Sciences (2000-3; 2004- 2016, except Fall 2009)
-Doctoral faculty member, Biology Ph.D. Program (Molecular, Cellular, & Developmental Biology subprogram; Plant Sciences subprogram), Graduate Center, CUNY, 1987-present
-Doctoral faculty member, Biochemistry Ph.D. Program, Graduate Center, CUNY, 1987-present

**Current Research Interests:** My laboratory has had a long-standing research program on provitamin A carotenoid biosynthesis to enable development of sustainable solutions to global vitamin A deficiency. This research has facilitated breeding of vitamin A-rich maize for Africa, supported development of Golden Rice for Asia and vitamin A-rich Cassava for Africa and South America.

**Development of innovative courses:** At CUNY, I have developed several courses in scientific writing. I draw on my own experience as a grant writer, reviewer and journal editor to help students learn how to write strong research proposals and scientific research manuscripts in courses that are student-based, feature career-related discussions, and utilize real-time interactive videoconferencing (which began long before the pandemic).

**Cold Spring Harbor Laboratory** (1986-1987):
Postdoctoral fellowship, laboratory of Dr. Pablo Scolnik

**Research areas:** Maize carotenoid biosynthesis; chloroplast import; plant transformation; maize genetics.

**Brookhaven National Laboratory** (1983-1986):
**National Science Foundation** Postdoctoral Fellowship in Plant Biology (one of 24 fellowships funded),
Laboratory of Drs. Benjamin and Frances Burr

**Research:** Discovery of DNAse hypersensitive sites in plant chromatin; maize genetics.

**S.U.N.Y. at Stony Brook** (1976-1982):
Ph.D. Dissertation: Regulation of Gene Expression of the *Escherichia coli* Outer Membrane Porins.
Thesis Advisor: Dr. Masayori Inouye, Professor and Chairman of Biochemistry

**Research:** Discovery of the first genes involved in bacterial two-component signal transduction; innovation of gene-tagging for gene isolation.

**Specialty:** Bacterial molecular biology, biochemistry, and genetics.

**MAJOR INTERNATIONAL AWARDS**

| Award | In honor of…. |
|---|---|
| **Trevor Goodwin Award**, 2023, **Japan**<br>*International Carotenoid Society* | **"for lifetime achievement in carotenoid biochemistry"**<br>*first USA scientist/ first woman awarded*<br>(2023 Eleanore Wurtzel, USA; 2017 Richard Cogdell, UK; 2014 George Britton, UK; 2011 JOSEPH Hirschberg, Israel)<br>***See:*** *https://www.carotenoidsociety.org/ics-2023-awards/#:~:text=TREVOR%20GOODWIN%20AWARD,Dr.%20Eleanore%20Wurtzel* |
| **Founding member**, ASPB Legacy Society, 2016<br>*American Society of Plant Biologists* | **Top ~200 researchers in plant biology**<br>*the only* ***ASPB Legacy*** *member at CUNY [see biography (2021):*<br>*https://aspb.org/wp-content/uploads/2021/03/Legacy-Society-Founding-Members-Eleanore-Wurtzel.pdf]* |
| **ICS Fellow**, elected in 2017, **Switzerland**<br>*International Carotenoid Society* | **"for excellence, leadership, and ethics"**<br>*the only* ***ICS fellow*** *at CUNY* |
| **ASPB Fellow** elected in 2012<br>*American Society of Plant Biologists* | **"for distinguished contributions to plant biology"**<br>*the only* ***ASPB fellow*** *at CUNY* |
| **AAAS Fellow** elected in 2006<br>*American Association for the Advancement of Science* [**Science** (2006) 314: 1258-1260] | **"pioneering research on provitamin A carotenoid biosynthesis"** *the only* ***AAAS Fellow*** *at Lehman College;*<br>*one of five fellows in all of CUNY* |

## OTHER HONORS

***University/College award***

**Excellence in Research, Scholarship and Creative Works Award** for 2009 in Natural Sciences (Lehman College)

***Honorary appointments***

**New York Botanical Garden** Institute of Systematic Botany (2003-present) ***Honorary Curator***

**New York Botanical Garden** (March 1, 2023-March 1, 2025) ***Affiliate Scientist*** ["recognizes and formalizes your relationship with the Garden. This is a two-year, renewable appointment."]

## *Visionary Leadership in Plant Biochemistry and Agriculture*

### Invited Editor

**Invited Editor** of **Methods in Enzymology on Carotenoids** (2022) which turned into three volumes and 1700 pages.

This collective and interdisciplinary knowledge from 55 carotenoid labs worldwide will enable future research in the field: Carotenoid and apocarotenoid analysis, volume 670; Carotenoid and apocarotenoid biosynthesis, metabolic engineering and synthetic biology, volume 671; and Biological functions of carotenoids and apocarotenoids in natural and artificial systems, volume 674.

***Invited Editor-in-Chief, Plant Science (Elsevier)*** *journal (January 1, 2023-December 31, 2026)*
*https://www.journals.elsevier.com/plant-science/editorial-board/eleanore-wurtzel-phd*

### *Meeting Founder or Organizer*

**Invited** by **Cold Spring Harbor Laboratory** to **Chair** and organize a **Banbury Conference, "**Revolutionizing Agriculture with Synthetic Biology." (Dec 2-5, 2018, Cold Spring Harbor Laboratory Banbury Center, Lloyd Harbor, NY). Co-organizers: Andrew Hanson, U. Florida and Claudia Vickers, CSIRO and The University of Queensland, Australia.

***Summary:*** Closed meeting of 33 invited international participants funded by Cold Spring Harbor Laboratory with the goal of strategizing on the challenges and opportunities for applying synthetic biology to agriculture. Invited participants: international and US scientists from academia and industry, government funding agencies and an editor from Science.

***Publication:*** Wurtzel, E. T. et al. (2019) Revolutionizing agriculture with synthetic biology. Nature Plants 5:1207-1210. doi:10.1038/s41477-019-0539-0 (free link: https://rdcu.be/bW3yr) [as of 1/24/20, **Altimetric score:** 230, in the ***99$^{th}$ percentile*** of ~300,000 tracked articles of a similar age in all journals; ***ranked #1*** in Nature Plants of articles of a similar age; ~***1800 articles*** accessed in first week after publication and ~**4200** ***articles*** accessed in ~first 9 weeks after publication.]

Chair, **Gordon Research Conference** on **Carotenoids** (2013) (with co-Chair, Xiang-Dong Wang, MD, PhD [Tufts U]; Vice-Chair, Johannes von Lintig, PhD [Case Western Reserve U]). January 6-11, 2013, Ventura, CA: http://www.grc.org/programs.aspx?year=2013&program=carot

Founder, new **Gordon Research Conference** Gordon Kenan Seminar on Carotenoids (2013) for early career scientists: http://www.grc.org/programs.aspx?year=2013&program=grs_carot

Vice Chair, **Gordon Research Conference** on **Carotenoids** (2010) (with Chair, Susan Mayne, PhD [Yale U]; co-Vice Chair, Xiang-Dong Wang, MD, PhD [Tufts U]

Founder, Organizer and first Chair of **Gordon Research Conference** on **Plant Metabolic Engineering**, July 10-15, 2005, Tilton, New Hampshire (Chair: E. Wurtzel; Vice-Chair: E. Grotewold, Ohio State U.): http://www.grc.org/programs.aspx?id=10729.

Founder and Co-Chair of a new **Gordon Research Conference** Gordon Kenan Seminar on **Plant Metabolic Engineering** for early career scientists, July 13-15, 2007, Tilton, New Hampshire (Co-chairs: J. Chappell, E. Grotewold & E. Wurtzel).

Organizer and Chair, *Medicinal Plants and Ethnobotany Symposium* in "Plant Biology 2006", Joint Annual Meeting of the **American Society of Plant Biologists** (ASPB) and the **Canadian Society of Plant Physiologists**, Boston, MA, Aug 5-9, 2006

***Scientific Conference Discussion Leader/Session Chair***

Session Chair and Discussion Leader, Session on "Synthetic Biology of Carotenoids," **Gordon Research Conference on Carotenoids,** January 5-10, 2025, Ventura, CA

Session Chair and Discussion Leader, "Keynote Session: Carotenoids: From Plants to Mammals," **Gordon Research Conference on Carotenoids,** January 8-13, 2023, Ventura, CA

Session Moderator, "Carotenoids and Environment," **First Virtual International Conference on Carotenoids**, online, sponsored by the International Carotenoid Society, June 22-25, 2021

Session Chair and Discussion Leader, "Biofortification and Bioavailability," **Gordon Research Conference on Carotenoids,** Newry, Maine, June 17-22, 2018

Organizer, **Power Hour**, on Facing Career Challenges and Professional Development for Women, **Gordon Research Conference on Plant Metabolic Engineering**, Waterville Valley, NH, 7/10/2017

Organizer, **Power Hour**, on Facing Career Challenges and Professional Development for Women, **Gordon Research Conference on Carotenoids**, Lucca, Tuscany, Italy, 5/23/2016 (Co-organizer L. Quadro, Rutgers Univ., NJ).

Session Chair and Discussion Leader, "Secondary Metabolism," **Gordon Research Conference** on **Plant Metabolic Engineering**, July 19-24, 2015, Waterville Valley, NH

Session Chair and Discussion Leader, "Key Proteins Involved in Carotenoid Metabolism," **Gordon Kenan Research Seminar** on **Carotenoids**, Jan 5-6, 2013, Ventura, CA.

Session Chair and Discussion Leader, "Exploring genetic and –omics approaches for understanding complex agronomic traits," **Gordon Research Conference** on **Plant Metabolic Engineering**, July 24-27, 2011, Waterville Valley, NH

Session Chair and Discussion Leader, "Regulatory Factors for metabolic Engineering," **Gordon Research Conference** on **Plant Metabolic Engineering**, July 12-17, 2009, Waterville Valley, NH

Session Chair, "Biotechnology," **Terpnet 2009, Tokyo, Japan** (May 25-29, 2009)

Session Chair and Discussion Leader, "Organization and evolution of plant metabolic pathways," **Gordon Research Conference** on **Plant Metabolic Engineering**, July 15-20, 2007, Tilton, New Hampshire.

Session Chair, "Pathways and Regulation," **Terpnet 2007, Strassbourg, France** (April 30-May 4, 2007)

Session Chair and organizer of contributed papers, Society of Economic Botany, annual meeting, **The New York Botanical Garden**, June 2002.

Organizer, 1998 CUNY Faculty Development Program: CUNY funding awarded to organize seminar series on *"Linking Research in Natural Products, Plant Biochemistry, and Biotechnology."*

Organizer, 1997 **New York Area Plant Molecular Biology Meeting**, Lehman College, CUNY

***Scientific Advisor***

***Advisor and Advisory Board, John Templeton Foundation (2022-2023)***

My ideas for new research funding led to planning of a new opportunity to fund $30 million of Plant Science research at the John Templeton Foundation. I served on the plant advisory board to develop the RFP for the program on "Resilience in Plant Science". The foundation is continuing to canvas Latin America to assess implementation of the program.

Steering Committee member (representing the Phytochemical Society of North America; contributing knowledge in the area of plant biochemistry) for the **Plant Science Research Network**, an NSF-supported Research Coordination Network, (6/14/16 to 2021).

***Summary:*** to develop a multidisciplinary and long-term vision for research and education in plant biology to be disseminated across multiple societies.

Ambassador, **Medicinal Plant Consortium** meeting, *National Center for Complementary and Integrative Health* (NCCIH), May 19, 2015, Bethesda, MD. NIH: Craig Hopp, Ph.D., Program Director, Division of Extramural Research, NCCIH; John Williamson, Ph.D., Branch Chief, Basic and Mechanistic Research in Complementary and Integrative Health, Division of Extramural Research, NCCIH; Josephine P. Briggs, M.D., Director of NCCIH; Barbara Gerrantana, Ph.D., Program Director, Division of Pharmacology, Physiology, and Biological Chemistry, NIGMS; plus others. Medicinal Plant Consortium (MPC) representatives: Joe Noel, Salk Institute; Robin Buell, Michigan State University; Basil Nikolau, Iowa State University; Dan Voytas, University of Minnesota; Toni Kutchan, Danforth Plant Science

Center; Elli Wurtzel, The City University of New York; Ed Eisenstein, University of Maryland; and Joe Chappell, University of Kentucky.

***Summary:*** The goal of the meeting (see: *webinar link)* was to present to NIH the current opportunities in plant biology worthy of NIH support. The outcome was a white paper (developed in collaboration with NIH program directors), which was submitted to NIH in Summer 2015, and which lays the foundation for future funding relevant to opportunities in plant biology.

Invited participant, **Banbury Conference on "**Evolution of Plant Metabolic Diversity," March 3-6, 2013, Cold Spring Harbor Lab Banbury Center, NY. Organized by Toni Kutchan, Danforth Center, MO; Rob Last, Michigan State University; Anne Osbourn, John Innes Centre, UK)

***Summary:*** Closed meeting of ~30 invited international participants to discuss the current challenges in the field of plant biochemistry.

Invited participant, **Plant Sciences Research Summit** at the Howard Hughes Medical Institute (2011).

***Summary:*** ~75 selected scientific leaders of the plant science community identified research priorities in energy, food, health, and environmental sustainability to guide plant science research over the next decade.
See: **Science** 30 September 2011: Vol. 333 no. 6051 p. 1806

Invited Speaker/Discussant, **Rockefeller Foundation- Workshop on Potential for Carotenoid Synthesis in Rice Endosperm**, New York, June 10-11, 1993. I spoke on "Genetics of the carotenoid pathway in maize endosperm"; and "Options for introducing genes of the pathway."

***Summary:*** *This workshop of 20 carotenoid scientific experts discussed feasibility and scientific planning for what later became known as "**Golden Rice**."*

Member, **Gordon Research Conferences (GRC) BOARD OF TRUSTEES** (Nov 1, 2012-Oct 31, 2018), elected by Chairs of all current GRC conferences. Also, serving as an *ex officio* member of the Conference Evaluation Committee.

***Summary:*** The **Gordon Research Conferences** are known as the premier scientific conferences in the world, as a result of the scientific oversight provided by the GRC Board of Trustees and Conference Evaluation Committee. The GRC Board of Trustees evaluates new and existing conferences as well as provides fiscal oversight and directives to the GRC such as the new initiative to expand globally and develop conferences in Asia. The organization's annual budget is ~35 million. As I have done when I was a member on the Conference Evaluation Committee (2006-2012), I will be providing scientific advice in the area of *plant biology* in addition to advising generally in biology and chemistry to recommend continuation and/or establishment of new conferences in the portfolio of ~500 prestigious **Gordon Research Conferences**. Our committee joins the GRC Conference Evaluation Committee to decide whether these internationally recognized interdisciplinary forums are at the cutting edge as needed to advance science when new fields and technologies are born. Members of the Board of Trustees include distinguished faculty, members of the National Academy of Sciences, and former winner of the US Medal of Science. Members are listed: http://www.grc.org/governance.aspx

Member, **Gordon Research Conferences** Conference Evaluation Committee (Nov 1, 2006-Oct 31, 2012).

***Summary:*** As the only plant biologist, I provided scientific advice in the area of *plant biology* in addition to advising generally in biology and chemistry to recommend continuation and/or establishment of new conferences in the portfolio of ~500 prestigious **Gordon Research Conferences**. Our committee works together with the GRC Board of Trustees to decide whether these internationally recognized interdisciplinary forums are at the cutting edge as needed to advance science when new fields and technologies are born. Members of the Conference Evaluation Committee include distinguished faculty and during my tenure have included members of the National Academy of Sciences, and former winner of the US Medal of Science. Members are listed: http://www.grc.org/selsched.aspx

Member (2012-2018), **Gordon Research Conferences** Strategic Planning committee.

**Chair** for the Biology Award (2006-2013; 2013-2018), **Gordon Research Conferences** Alexander M. Cruickshank Lectureship Award committee.

***Summary:*** award annually the prestigious lectureship to one biologist, one physicist and one chemist presenting from several hundred GRC conferences.

Council of the **Gordon Research Conferences** representative (2005-2018) includes representatives of all GRC conferences and members of the Board of Trustees and Selection and Scheduling Committee.

Advisory Group, "BioCassava Plus" project to improve provitamin A carotenoids and other targets -funded by the Gates Foundation, Danforth Plant Science Center, St. Louis. MO (2013-2016).

***Summary:*** I provide advice on carotenoid biosynthesis to improve nutritional content of Cassava as a sustainable solution to vitamin A deficiency.

Oversight Committee, Medicinal Plant Consortium-**National Institutes of Health** Grand Opportunity (ARRA) funded multi-institutional research consortium grant, "*Advancing Drug Development from Medicinal Plants using Transcriptomics and Metabolomics*" (PIs: J. Chappell, S. O'Conner, D. DellaPenna; 2009-11, $6 million)

Agriculture Biotechnology Committee, **Government of Gujarat, India** (2004)
Advisory Group, **National Science Foundation**-funded *Cereal Genomics Workshop,* CIMMYT, Mexico (2004) and formal course held at Cold Spring Harbor Laboratory.
Advisory Board, *BIORESEARCH JOURNAL* (India) (1996)
Board of Directors- Black Rock Forest Consortium- Lehman College representative (1994-95)
**Sigma Xi (The Scientific Research Society)**, Lehman College Chapter- President (1996-1997); President-elect (1995-96); Treasurer (1992-94); full member (1987- present)

***Reviewer of Grants, Competitions, and Programs***

Invited external evaluator of Botany graduate program, Howard Univ., Washington, D.C. (11/87)
Site team member, **National Institutes of Health- MBRS grant review**, UC San Diego, California (1/88)
Review panel member, **National Institutes of Health- MBRS** program, Washington, D.C. (2/89; 5/90; 9/91; 6/95)
Review panel member, **National Institutes of Health- Genetics Panel, SCORE-MBRS** program, Washington, D.C. (6/99; 9/99; 9/00, 2/02; 10/04)
Special Emphasis Panel member, **National Institutes of Health** (2004)
Special Emphasis Panel member, **National Institutes of Health** – Metabolic Process in Plants (2005)
Review panel member, **National Science Foundation** IGERT Program (preproposal review) (9/00)
Review panel member, **National Science Foundation** IGERT Program (proposal review) (3/01)
Review panel member, **National Science Foundation** Interagency **(NSF, NIH, USDA, DOE, DOD, DOC, EPA, NASA)** program in Metabolic Engineering (5/01; 6/02; 6/03)
Advisory Panel member, **National Science Foundation** Integrative Plant Biology Program (2001-2002; 2002-2004)
Advisory Panel member, **National Science Foundation** Plant Genome -Basic Research to Enable Agricultural Development (BREAD) Panel (10/2010-2/2011)
Review panel member, **USDA**, Plant Biochemistry (Washington, D.C., June 9-11, 2008)
Review panelist, Biochemistry and Molecular Biology section, PSCUNY grant program, CUNY (1988,'96,'97,'98)
Review Panel- William Patterson College (New Jersey) Summer Research Grants (1995; '96; '97)
Chancellor appointed panel member of university-wide GRI committee on CUNY equipment grants
Review Panelist- 1997 Masters Thesis Competition, Northeast Association of Graduate Schools
External reviewer, Letters of Intent, **Grand Challenges in Global Health** initiative (**Gates Foundation** $200 million program)/ managed by Foundation of NIH (2004)
External reviewer, Science Center Program (e.g. Moscow, Ukraine) of the **US Department of State** (2004)
External reviewer, **USDA** research grant applications (…;2005; 2007)
External reviewer, **USDA** (NRI- Biobased Products & Bioenergy Production Research Program) research grant applications (2005)
External reviewer, **USDA** SBIR (small business research innovation) grant applications (2004; 2005)
External reviewer, **National Science Foundation** (Integrative Plant Biology; Metabolic Biochemistry; others) grant applications (1998, 2002, 2003, 2004; 2005; 2010)
External reviewer, **NSERC,** Canada Nat. Sciences & Engineering Research Council, 2010 Discovery Grant proposal
External reviewer, **International Foundation of Science (Sweden)** grant application (1999; 2004)

External reviewer, **US-Israel Binational Foundation** research grant application (1999)
External reviewer, **Israel Science Foundation** research grant application (2003; 2005)
External reviewer, **Department of Energy** Energy Biosciences Program (2001, 2002)
External reviewer, grant applications- **Midwest Plant Biotechnology Consortium** (1990, 1991)
External reviewer, **Ohio State University** OARDC Research Enhancement Grants Program (2003; 2007)
External reviewer, proposal for new **Gordon Research Conferences** (2003; 2004)
Ad hoc reviewer- CUNY collaborative research grants program (1994)

***Journal Editorial Boards and Guest Editor***

Methods in Enzymology, 3 volumes (1700 pages) on "Carotenoids", Eleanore T. Wurtzel, Editor (2022) (Editors-in-chief: David Christianson, U. Pennsylvania and Anna Mari Pyle, Yale) Elsevier. (Compiled collection **LINK**: https://www.dropbox.com/s/q99khb4wtzg9uld/Wurtzel_2022_Methods in Enzymology_volume 670_671_674.pdf?dl=0)

1. Eleanore T. Wurtzel, Editor (2022) Methods in Enzymology: Carotenoids: Carotenoid and apocarotenoid analysis, volume 670, Elsevier. 554 pages. https://www.elsevier.com/books/carotenoids-carotenoid-and-apocarotenoid-analysis/wurtzel/978-0-323-99975-5
2. Eleanore T. Wurtzel, Editor (2022) Methods in Enzymology Carotenoids: Carotenoid and apocarotenoid biosynthesis, metabolic engineering and synthetic biology, volume 671, Elsevier. 574 pages https://www.elsevier.com/books/carotenoids-carotenoid-and-apocarotenoid-biosynthesis-metabolic-engineering-and-synthetic-biology/wurtzel/978-0-323-91353-9
3. Eleanore T. Wurtzel, Editor (2022) Methods in Enzymology Carotenoids: Biological functions of carotenoids and apocarotenoids in natural and artificial systems, volume 674, Elsevier. 566 pages. https://www.elsevier.com/books/carotenoids-biological-functions-of-carotenoids-and-apocarotenoids-in-natural-and-artificial-systems/wurtzel/978-0-323-91351-5

Plant Science (Elsevier) Editor-in-Chief (2023-2026)

Plant Science (Elsevier) (Editorial Advisory Board member) 2022-2023

Plant Physiology (Monitoring Editor, 2008-2013; 2013-2021) - solicit reviews and render decisions for publication in the most highly cited journal in plant biology.

Plant Physiology-Focus Issue on Synthetic Biology (March 2019)- Review updates and research articles, Co-editors: Andrew Hanson, Julian Hibberd, Mattheos Koffas, Joachim Kopka, and Eleanore T. Wurtzel

Frontiers in Plant Physiology (Associate Editor) - a new online/open access journal launched in 2010-2016

Frontiers in Plant Metabolism & Chemodiversity (Assoc. Editor) - new online/open access journal launched in 2011-2016

Archives in Biochemistry and Biophysics, 2010 "Carotenoid Highlights" edition, Guest Editors: John Landrum (Florida International U.), Xiang-Dong Wang (Tufts U.) and Eleanore T. Wurtzel (Lehman College, CUNY)

***Scientific Journal Reviewer***

*Applied Microbiology & Biotechnology; Archives of Microbiology; Biochemical Systematics & Ecology; Biotechnology & Bioengineering; Chemistry & Biology; Crop Science; Electronic Journal of Biotechnology; FASEB Journal, Horticultural Science; Journal of Biological Chemistry; Journal of Experimental Botany; Journal of Heredity; Journal of Inorganic Biochemistry; Journal of Molecular Evolution; Metabolic Engineering; Molecular Genetics & Genomics; Nature Biotechnology; Nature Communications; New Phytologist; Planta; Plant Biotechnology J.; Plant Cell; Plant Molecular Biology; Plant Physiology; Plant Physiology & Biochemistry; Plant Science; Proceedings of the National Academy of Sciences, USA; PLOS One; Theoretical & Applied Genetics.*

**SELECTED PRESTIGIOUS GRANT AWARDS**

~$8 million *(**see detailed listing at end of CV**)* including grants from NIH, NSF, American Cancer Society, Rockefeller Foundation, McKnight Foundation, USDA, DOD, DOE, NASA:

**NIH** Predoctoral training fellowship (1977-79)
**National Science Foundation** postdoctoral fellowship in Plant Molecular Biology (**only 24 awarded nationwide**, 1983-1985)
**National Science Foundation-RIMI** award for establishment of a molecular biology laboratory at Lehman College, CUNY (1988-1992)
**McKnight Foundation** Individual Research Award in Plant Biology (1989-92) (**only 10 awarded every 3 yrs.**)
**American Cancer Society** Research grant recipient (1989-1992)
**Rockefeller Foundation International Rice Biotechnology Program** research funding (1992-2000), only one of two labs worldwide funded to work on carotenoids in rice.
**National Institutes of Health** funding (>25 years continuous NIH grant support)
Lehman College Shuster Faculty Fellowship (1987, 1988, 1992)
Lehman College Sabbatical Fellowship (half-year/full pay), Sept. 1998-Jan 1999; Sept. 2009- Jan. 2010.
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**PATENT APPLICATIONS SUBMITTED THROUGH CUNY**

**#1 "Sequences for altering plant and seed development and plant disease resistance."**
Inventors: Dr. Eleanore Wurtzel and Dr. Zhaohui Li
*Provisional patent* submitted by CUNY 4/17/98 to the United States Patent and Trademark Office

**#2** "**Promoter DNA sequences for controlling low level constitutive expression in plants and for identifying adjacent genes."** [Patent disclosure submitted to University Patent Committee (Feb. 1998)
Date: February 9, 1998; Inventors: Dr. Eleanore Wurtzel and Dr. Zhaohui Li

**#3 "DNA sequence encoding phytoene desaturase from monocot plant useful for engineering carotenoid biosynthesis"** [Patent disclosure submitted to University Patent Committee (Feb. 1998)
Date: February 24, 1998
Inventors: Dr. Eleanore Wurtzel and Dr. Arulmolee Yoganathan

**#4** "**DNA sequence encoding ZDS from monocot plant useful for engineering carotenoid biosynthesis"**
Patent disclosure submitted to University Patent Committee (Feb. 9, 1998)
Inventors: Dr. Eleanore Wurtzel and Ruibai Luo

**#5 "Compositions and Methods for Producing High Pro-Vitamin A in Corn and Other Crops"**
*Provisional patent, US serial #*61/243,403.
Date: September 16, 2009; Inventors: Dr. Eleanore Wurtzel and Ratnakar Vallabhaneni

**#6 "Cells and methods for producing lutein"**
*Provisional patent, US serial #61/595,529*
Filing Date: February 6, 2012
*Patent pending (US and International)*: PCT/US2013/024746
Filing date: February 5, 2013
Inventors: Dr. Eleanore T. Wurtzel and Dr. Rena Quinlan

**#7 "CruP protects against ROS in oxygenic photosynthetic organisms "**
*Provisional patent, US serial #*61/649961 (Filing Date: May 22, 2012)
*Patent pending (US and International)*: PCT/US2013/42010
Filing date: May 21, 2013
International Application Publication Number: WO 2013/177156 A1
International Publication date: November 28 2013
Inventors: Dr. Eleanore T. Wurtzel and Dr. Louis Bradbury

**#8 "Method for Modifying Carotenoid Biosynthesis in Plants"**
U.S. Patent No. 9,677,056 (issued June 13, 2017)
Inventors: Dr. Eleanore T. Wurtzel and Dr. Maria Shumskaya
**[***Provisional patent, US serial #*61/683,494 (Filing Date: August 15, 2012)
*Patent pending (US and International)*: PCT/US2013/55069; Filing Date: August 15, 2013
International Application Publication Number: WO 2014/028696 A1; International Publication date: Feb. 20, 2014
US Patent Application Number: US2015/0315551 A1; US Patent Application Publication: November 5, 2015]

**#9 "Method for isomerizing double bonds"**
US Patent No. 10,913,959 (issued February 9, 2021)
Inventors: Dr. Eleanore T. Wurtzel and Dr. Jesús Beltrán
[*Submitted to CUNY IP office:* May 14, 2015**;** *Provisional patent, US serial #*62/168,994
Filing Date: June 1, 2015; 7/11/2018; *Patent pending (US and International)*: PCT15/169,894; 16/032,454.]

**INVITED RESEARCH TALKS:**

2025

**California** Keynote Mentorship Lecture, **Gordon Research Seminar on Carotenoids,** January 5-10, 2025, Ventura, CA, "Finding the path to discoveries for solving global vitamin A deficiency"

2022

**New York** **LP$^2$ Lifelong Peer Learning Program, CUNY Graduate Center, by Zoom,** 5/9/22 @ 4PM
"Vitamin A Deficiency, Synthetic Biology and the Coming Green Revolution" (invited speaker)

2021

**New York** **Lehman College**, CUNY Institute for Health Equity (CIHE), by Zoom (11/5/21)
"Solving global vitamin A deficiency through basic research in plant biology"
(invited speaker)

**China** The **2nd International Symposium of Horticulture and Plant Biology**, Wuhan, China by Zoom 8/5-9/2021
"From Golden Rice to revolutionizing agriculture with synthetic biology (invited speaker)

**2020**

**New York** **Lehman College,** Department of Biological Studies, by Zoom, 2/8/2021
"From *Golden Rice* to revolutionizing agriculture with synthetic biology" (speaker)

**California** **University of California, Davis,** Plant Biology Department, by Zoom, Nov 20, 2020,
"From *Golden Rice* to revolutionizing agriculture with synthetic biology" (invited speaker)

**Delaware** **University of Delaware,** Plant & Soil Science Department, Newark, Feb 21, 2020
"From *Golden Rice* to revolutionizing agriculture with synthetic biology" (invited speaker)

**2019**

**New York** **CUNY Graduate Center**, May 2, 2019 panel on Unseen worlds - plants and their inextricable link to our own survival
"Plant diversity and solutions for global health" (invited speaker)

**New York** **New York Botanical Garden and Lehman College Partnership** Lehman College Library, 4/2/2019
"Solving global vitamin A deficiency through plant biology" (invited speaker)

**2018**

**New York** **Banbury Center meeting at Cold Spring Harbor Laboratory** on Revolutionizing Agriculture with Synthetic Biology, Lloyd Harbor, December 2-5, 2018 (invited organizer and speaker)
"The complexity of engineering carotenoid biosynthesis"

**Maine** **Gordon Research Conference GRS on Carotenoids,** Newry, June 16-17, 2018 (invited key note speaker)
"Solving global health problems through discoveries in carotenoid biosynthesis- a fascinating journey with future opportunities"

**2017**

**Switzerland** **18th International Symposium on Carotenoids,** Lucerne (July 9- 14, 2017) (invited plenary speaker) **"**A Novel Gate-Keeper of Carotenoid Biosynthesis in Plants**"**

**Maryland** **18th Annual Plant Biology Minisymposium**, University of Maryland, College Park, MD (5/25/17)
**"**How global health problems are being solved through plant biology" (invited speaker)

**2016**

**New York** **Keynote Lecture,** Lehman College (Dec. 1, 2016)
**"**How global health problems are being solved through plant biology"

**New York** **Keynote Lecture to CUNY Doctoral Faculty,** Graduate Center, CUNY (Nov. 6, 2016)
**"**How global health problems are being solved through plant biology"

**Italy** **Gordon Research Conference** on **Carotenoids**, Lucca, Tuscany, Italy (May 22-27, 2016)
"A novel gate-keeper of carotenoid biosynthesis in plants"

**2015**

**New Hampshire** **Gordon Research Conference** on **Plant Metabolic Engineering**, Waterville Valley, July 19-24, 2015, "Specialized metabolism" (Session Chair and Discussion Leader).

**2014**

**New York** **New York Consortium on Membrane Protein Structure (NYCOMPS)** annual meeting, New York Structural Biology Center (11/21/14) "Z-ISO, a novel redox-regulated heme isomerase for carotenoid biosynthesis" (invited speaker)

**Utah** **17th International Symposium on Carotenoids,** Park City (June 29- July 4, 2014) "Engineering carotenoids: a multi-dimensional puzzle yet to be solved" (invited plenary speaker)

**2013**

**New York** **Banbury Conference** on "Evolution of Plant Metabolic Diversity," Cold Spring Harbor Lab Banbury Center (March 3-6, 2013) "Topological control of carotenoid biosynthesis: moving beyond the parts list" (invited speaker of ~30 participants)

**China** **Huazhong Agricultural University,** Key Laboratory of Horticultural Plant Biology (Ministry of Education), Wuhan, China (7/23/2013) "Unlocking molecular secrets in food crops to eradicate global malnutrition" (invited research seminar; host: Dr. Xiuxin Deng, President)

**China** **Capital Normal University,** College of Life Sciences, Beijing, China (7/26/13) "Unlocking molecular secrets in food crops to eradicate global malnutrition" (invited research seminar; host: Dr. Yi-kun He, Vice President)

**2012**

**New Jersey** **Rutgers University, New Brunswick,** Dept. of Plant Biology and Pathology (12/14/ 2012) "Unlocking molecular secrets in food crops to eradicate global malnutrition," (invited research seminar).

**New York** **New York Consortium on Membrane Protein Structure (NYCOMPS)** annual meeting, New York Structural Biology Center (11/15/12) "Z-ISO characterization" (invited speaker)

**2011**

**New Hampshire** **Gordon Research Conference** on **Plant Metabolic Engineering**, Waterville Valley, July 14-29, 2011, "Exploring Genetic and -omics Approaches for Understanding Complex Agronomic Traits" (Session Chair and Discussion Leader).

**Poland** **16th International Symposium on Carotenoids**, Krakow (July 17-22, 2011) "The revised carotenoid biosynthetic pathway in plants and discoveries for obtaining sustainable agricultural solutions to global vitamin A deficiency," (invited speaker).

**2010**

**North Carolina** **ABRCMS** (Annual Biomedical Research Conference for Minority Students) meeting, Charlotte (Nov 10-13, 2010) "Unlocking molecular secrets in food crops to eradicate global malnutrition" (plenary speaker in Plant Biology symposium organized by ASPB, American Society of Plant Biologists).

**Washington D.C.** **First Global Conference on Biofortification** organized by HarvestPlus, Washington, D.C. (Nov. 9-11, 2010) "Maize: a model cereal crop for developing strategies to solve global vitamin A deficiency" (invited speaker).

**New Jersey** **Fairleigh Dickinson University**, School of Natural Sciences (10/28/10) "Unlocking molecular secrets in food crops to eradicate global malnutrition," (invited research seminar).

**2009**

**Israel** **Newe Ya'ar Research Center,** Ramat Yishay (11/9/09) "Developing strategies for metabolic engineering of provitamin A carotenoids in maize and other cereal crops,**"** (invited research seminar).

**Israel** **Israel Science Foundation** Workshop on Metabolism, metabolomics and metabolic engineering in plants to increase crop productivity and nutritional value, Ein Gedi, Nov. 1-4, 2009, **"**Developing strategies for metabolic engineering of provitamin A carotenoids in maize and other cereal crops,**"** (invited speaker).

**New Hampshire** **Gordon Research Conference** on **Plant Metabolic Engineering**, Waterville Valley, July 12-17, 2009, "Regulatory Factors for metabolic Engineering" (Session Chair and Discussion Leader).

**Japan** **TERPNET 2009**, Ninth International meeting, Tokyo, May 25-29, 2009, "Regulation of provitamin A carotenoid synthesis in maize: developing a model for predictive metabolic engineering of carotenoids in the Grasses," (invited speaker and discussion leader).

**2008**

**Delaware** **University of Delaware**, Dept. of Plant and Soil Sciences (5/1/09), "Maize: a model cereal crop for developing strategies to solve global vitamin A deficiency" (invited research seminar).

**Missouri** **Danforth Plant Sciences Center**, St. Louis, MO (11/5/08), "Maize: a model cereal crop for developing strategies to solve global vitamin A deficiency" (invited research seminar).

**Israel** **The Hebrew University,** Jerusalem, Department of Plant & Environmental Sciences (7/20/08), "Maize: a model cereal crop for developing strategies to solve global vitamin A deficiency" (invited research seminar).

**Mexico** **Centro de Investigación Científica de Yucatán (CICY)**, Unidad de Bioquímica y Biología Molecular de Plantas, Mérida, Yucatán, 7/2/08, "Maize: a model cereal crop for developing strategies to solve global vitamin A deficiency" (invited research seminar).

**Mexico** **American Society of Plant Biologists** annual meeting Plant Biology 2008, Mérida, Yucatán, June 27- July 1, 2008, MAC Symposium: Foods of the Gods, "Maize: a model cereal crop for developing strategies to solve global vitamin A deficiency"(invited symposium speaker).

**Washington, D.C.** **Maize Genetics Conference,** Feb. 27- Mar. 2, 2008, "The revised carotenoid biosynthetic pathway in plants" (speaker).

**2007**

**New Hampshire** **Gordon Research Conference** on **Plant Metabolic Engineering**, Tilton, July 15-20, 2007, "Organization and evolution of plant metabolic pathways" (Session Chair and Discussion Leader).

**New Hampshire** **Gordon Research Conference**-Graduate Research Seminar on **Plant Metabolic Engineering,** Tilton, July 13-15, 2007, "Launching young scientists into the future: Is this why we are here today?" (invited speaker).

**Ohio** **Ohio State University**, Columbus, Dept. of Plant, Cellular, and Molecular Biology, May 10, 2007, "Regulation of provitamin A carotenoid accumulation in cereal crops" (invited research seminar).

**France** **TERPNET 2007** Eighth International meeting: Biosynthesis and function of isoprenoids in plants, microorganisms and parasites, Strasbourg, April 30-May 4, 2007, "Regulation of provitamin A carotenoid accumulation in cereal crops" (invited speaker).

**France** **CNRS**/Université Paul Sabatier, Surfaces Cellulaires et Signalisation chez les Végétaux, Toulouse, April 27, 2007, "Regulation of provitamin A carotenoid accumulation in cereal crops" (invited research seminar).

**North Carolina** **University of North Carolina** at Charlotte, Conference: Who we are and what we eat: the role of metabolomics and nutrigenomics in creating healthful foods and healthier lives, April 15-17,

2007, "Regulation of provitamin A carotenoid accumulation in cereal crops" (invited plenary speaker).

**California** **Gordon Research Conference** on **Carotenoids**, Ventura, Jan. 7-12, 2007, "Regulation of provitamin A carotenoid accumulation in cereal crops" (invited speaker).

**2006**

**New Jersey** **Princeton University,** American Chemical Society, Princeton University section, 1/16/06, "Plant genomics: molecular solutions to global vitamin A deficiency" (invited dinner speaker).

**2005**

**New Hampshire** **Gordon Research Conference** on **Plant Metabolic Engineering**, Tilton, July 10-15, 2005 (founder and **Chair**).

**North Carolina** **North Carolina A &T University**, Department of Biology, Greensboro, 3/30/05, "Plant genomics: molecular solutions to global vitamin A deficiency" (invited research seminar).

**2004**

**New York** **Lehman College, CUNY,** Dept. of Biological Sciences, 12/6/04, "Plant genomics: molecular solutions to global vitamin A deficiency" (invited research seminar).

**India** Public lecture sponsored by **Gujarat State Biotech Mission** and S**hri M. & N. Virani Science College,** Rajkot, 11/4/04, **"**Plant genomics: molecular solutions to global nutritional deficiency (invited speaker).

**India** Public lecture sponsored by **Gujarat State Biotech Mission** and **M.G. Science Institute**, Ahmedabad, Gujarat, 11/5/04, "Plant genomics: molecular solutions to global nutritional deficiency" (invited speaker).

**India** **International Knowledge Millennium Conference**, Hyderbad, October 31-November 2, 2004, Hyderabad, "Plant genomics: molecular solutions to global vitamin A deficiency" (invited speaker and panel discussant).

**India** **Osmania University**, Hyderbad, Department of Genetics, 10/20/04, "Plant genomics: molecular solutions to global vitamin A deficiency" (invited research seminar).

**India** **University of Hyderabad**, Hyderabad, Department of Plant Sciences, 10/29/04, "Plant genomics: molecular solutions to global vitamin A deficiency" (invited research seminar).

**New York** **Cornell University**, Ithaca, Dept. of Plant Breeding, 5/4/04, "Genomics, genetics, and biochemistry of maize carotenoid biosynthesis" (invited research seminar); lecture videotaped for streaming video providing access by Univ. of Kwazulu Natal, South Africa.

**2003**

**Illinois** **Phytochemical Society of North America**, Peoria August 9-13, 2003, Symposium on "Secondary Metabolism in Model Organisms, "Genomics, genetics, and biochemistry of maize carotenoid biosynthesis" (invited plenary speaker).

**2002**

**New York** **Brooklyn College, CUNY**, 11/22/02, "Developing rational metabolic engineering strategies for enhanced carotenoid content in cereal crops" (invited research seminar).

**Canada** **Eastern Cereal and Oilseed Research Centre**, Ottawa, 11/8/02, "Developing rational metabolic engineering strategies for enhanced carotenoid content in cereal crops" (invited research seminar).

**New Jersey** **New York Area Plant Molecular Biology Meeting**, Rutgers University, New Brunswick, 1/19/02, "Maize phytoene desaturase (PDS) and zeta-carotene desaturase (ZDS) produce poly-Z-lycopene: Implications for genetic manipulation of carotenogenesis in maize and rice" (speaker).

**Hawaii** **University of Hawaii**, Manoa, Dept. of Tropical Plant and Soil Sciences, 1/8/02, "Lessons from metabolic engineering of carotenoid accumulation in food crops and microorganisms" (invited research seminar).

**Hawaii** **13th International Carotenoid Symposium,** Honolulu, Jan. 6-11, 2002, "Cloning and characterization of a phytoene synthase (Psy) gene from rice and comparison to maize *Y1*" (speaker).

**2001**

**New Jersey** **Bristol-Myers Squibb** Company, New Brunswick, Pharmaceutial Research Institute, 2/5/01, "Lessons from metabolic engineering of carotenoid accumulation in food crops and microorganisms" (invited research seminar).

**2000**

**New York** **New York Plant Molecular Biology Meeting**, New York University, 1/22/00, "Metabolic engineering of the carotenoid biosynthetic pathway" (speaker).

**1999**

**Thailand** **General Meeting of the International Program on Rice Biotechnology**, Phuket, Sept. 20-24, 1999, "Gene expression and control of carotenoid accumulation in maize and rice" (invited speaker).

**Australia** **Twelfth International Symposium on Carotenoids**, Cairns, July 18-23, 1999, "Immunolocalization of carotenoid enzymes in maize endosperm" (speaker).

**Illinois** **University of Illinois**, Urbana-Champaign, Dept. of Crop Sciences, 4/28/99), "Research towards metabolic engineering of provitamin A carotenoid accumulation in maize and other cereals" (invited research seminar).

**1997**

**New York** **The Arthur Cronquist CUNY Plant Sciences Symposium**, Lehman College, CUNY, 11/8/97, **"**Research towards metabolic engineering of provitamin A carotenoids in rice endosperm" (invited speaker).

**New York** **New York Biotechnology Association Meeting**, Manhattan, October 16-17, 1997, "Research towards metabolic engineering of provitamin A carotenoids in rice endosperm" (invited speaker, representing CUNY Center for Applied Biotechnology and Biomedicine, CABB).

**Malaysia** **General Meeting of Rockefeller Foundation International Program on Rice Biotechnology**, Malacca, Sept. 15-19, 1997, **"**Research towards metabolic engineering of provitamin A carotenoids in rice endosperm" (Invited speaker).

**New Jersey** **Fairleigh Dickinson University**, Teaneck, 4/10/97, "Plant genetic engineering: a potential solution to world-wide Vitamin A deficiency" (invited research seminar).

**New York** **Lehman College, CUNY,** Conference: Women in Science and Technology: Looking to the Future, 3/26/97, "Making Career Choices; My mother, myself" (invited speaker).

**1995**

**New York** **Hunter College**, **CUNY**, Biology Department, 12/11/95, **"**Solving world-wide Vitamin A deficiency through plant biotechnology" (invited research seminar).

**New York** **Queens College**, **CUNY**, Biology Department, 12/4/95, "Solving world-wide Vitamin A deficiency through plant biotechnology" (invited research seminar).

**California** **Maize Genetics Conference**, Asilomar, March 16-19, 1995, "Regulation of carotenoid biosynthesis in maize endosperm" (speaker).

**California** **Gordon Research Conference** on **Carotenoids**, Oxnard, Feb. 5-9, 1995, "Carotenoid expression in maize and rice: a comparison" (invited speaker).

**1994**

**New York** **New York University**, 11/4/94, "Regulation of carotenoid biosynthesis" (invited research seminar).

**New York** **City College, CUNY,** Biology Department, 10/18/94, "Genetic engineering of pro-Vitamin A in rice: a complex problem with world-wide ramifications" (invited research seminar).

**Indonesia** **Rockefeller Foundation International Program on Rice Biotechnology**, 7th annual meeting, Bali, May 16 - 21, 1994, "Research towards improvement of the carotenoid content of rice endosperm" (invited speaker).

**1993**

**Georgia** **University of Georgia**, Athens, 11/8/93, "Molecular biology of carotenoid biosynthesis- or how to solve engineering of rice by using maize as a model system" (invited research seminar).

**Norway** **Tenth International Symposium on Carotenoids**, Trondheim, June 20-25, 1993, "Comparison of gene expression in rice and maize carotenoid biosynthesis" (invited speaker).

**New York** **Rockefeller Foundation Workshop on Potential for Carotenoid Synthesis in Rice Endosperm**, Manhattan, June 10-11, 1993, "Genetics of carotenoid pathway in maize endosperm" (invited speaker). This workshop discussed feasibility of what later became "Golden Rice."

**New York** **Rockefeller Foundation Workshop on Potential for Carotenoid Synthesis in Rice Endosperm**, Manhattan, June 10-11, 1993, "Options for introducing genes of the pathway" (invited speaker). This workshop discussed feasibility of what later became "Golden Rice."

**Connecticut** **Northeast section, American Society of Plant Physiology** meeting, U. Conn., May 6-7, 1993, "Molecular biology of carotenoid biosynthesis in higher plants" (invited speaker).

**Florida** **Florida International University**, Miami, 4/22/93, "Molecular biology of carotenoid biosynthesis" (invited research seminar).

**Illinois** **Maize Genetics Conference**, St. Charles, March 18-21, 1993, "Comparison of gene expression in rice and maize carotenoid biosynthesis" (speaker).

**Thailand** **Rockefeller Foundation International Rice Biotechnology Symposium**, ChangMai, Feb. 1-5, 1993, "Comparison of gene expression in rice and maize carotenoid biosynthesis" (invited speaker).

**New York** **New York Area Plant Molecular Biology Symposium**, New York University, 1/23/93, "Molecular genetics of maize carotenoid biosynthesis" (speaker).

**1991**

**New Jersey** **New York Area Plant Molecular Biology Symposium**, Waksman Institute, Rutgers University, 1/91, "Molecular genetics of maize carotenoid biosynthesis" (speaker).

**1990**

**Minnesota** **McKnight Foundation Plant Biology Meeting**, Minneapolis, 5/90, "Molecular biology of carotenoid synthesis in maize" (invited speaker).

**Italy** **Cycad Symposium,** University of Naples, Naples, 10/90, "Molecular systematics of cycad evolution" (invited speaker).

**1985**

**Georgia** **First International Congress of Plant Molecular Biology**, Savannah, 1985, DNase hypersensitive sites at the *Shrunken* locus in *Zea mays* (speaker).

**Cold Spring Harbor** **Joint Pioneer Hybred-Cold Spring Harbor Laboratory Research Meeting**, Cold Spring Harbor, 1985, "Modulation of local chromatin structure associated with plant gene expression." (invited speaker).

**Maryland** **MidAtlantic section, American Society of Plant Molecular Biology** meeting, Beltsville, 1985, "DNase hypersensitive sites at the *Shrunken* locus in maize" (speaker).

**New Hampshire** **Gordon Research Conference** on **Plant Molecular Biology**, Andover, 1985, "Examination of controlling element insertion on DNase hypersensitive sites" (speaker).

**Wisconsin** **Maize Genetics Conference**, 1985, DNase hypersensitive sites at the *Shrunken* locus in *Z. mays.* (speaker).

**OTHER RESEARCH PRESENTATIONS:**

**2021**

**Online** **First Virtual International Conference on Carotenoids**, sponsored by the International Carotenoid Society, June 22-25, 2021, Royce T. Cumming*, Kaijie Zhu and Eleanore T. Wurtzel "Unraveling the evolutionary history of carotenoid modification within stick and leaf insect camouflage (Insecta: Phasmatodea)" (*speaker)

**2012**

**California** **Gordon Research Conference** on Carotenoids, Ventura, Jan 6-11, 2013, Shumskaya, M* and Wurtzel, E.T. "The carotenoid biosynthetic pathway: Thinking in all dimensions" (*speaker).

**California** **Gordon Research Conference** on Carotenoids, Ventura, Jan 6-11, 2013, Shumskaya, M* and Wurtzel, E.T. "The carotenoid biosynthetic pathway: Thinking in all dimensions" (*poster presenter).

**California** **Gordon Kenan Research Seminar** on Carotenoids, Ventura, Jan 5-6, 2013, Shumskaya, M* and Wurtzel, E.T. "The carotenoid biosynthetic pathway: Thinking in all dimensions" (*poster presenter).

**California** **Gordon Kenan Research Seminar** on Carotenoids, Ventura, Jan 5-6, 2013, Shumskaya, M* and Wurtzel, E.T. "The carotenoid biosynthetic pathway: Thinking in all dimensions" (*primary speaker for talk).

**Israel** **Genetic Society of Israel** annual meeting, Rehovot, Feb. 20, 2012, Amar, D.*, Tzfadia, O.*, Bradbury, L.M.T., Wurtzel, E.T., and Shamir, R. "The MORPH algorithm: ranking candidate genes for membership in A*rabidopsis thaliana* pathways" (*poster presenter).

**California** **Gordon Research Conference** on Metals in Biology, Ventura, Jan 22-27, 2012, Beltrán, J., Kloss. B., Hosler, J.P., Monaco, R., Love, J., and Wurtzel, E.T.* "A new heme isomerase required for provitamin A carotenoid biofortification" (*poster presenter).

**2011**

**Malaysia** **ISMB/ECCB** Kuala Lumpur, Malaysia, Nov 30- Dec 2, 2011, Khan, F.*, Muyanga, S. Christoffels, A., Pretorius, A. and Wurtzel, E.T. "A Computational study of carotenoid gene expression using micro-array data" (*presenter)

**New Hampshire** **Gordon Research Conference (GRC)**- on Plant Metabolic Engineering and GRC Graduate Research Seminar on Plant Metabolic Engineering, Waterville Valley (July 24-29, 2011) Beltrán, J.*, Chen, Y., Shumskaya, M., and Wurtzel, E.T. "Unraveling the mechanism of Z-ISO function in plant carotenogenesis" (*poster presenter and Winner, ASPB Best Poster Award).

**Israel** **6th Congress of the Federation of the Israel Societies for Experimental Biology** - FISEB (ILANIT), Eilat, Israel (Feb 7-10, 2011), Tzfadia, O.*, Bradbury, L.M.T., Ma'ayan, A., Shamir, R., Wurtzel, E.T., "Systems biology approach for the discovery of a provitamin A carotenoid biosynthesis transcriptional regulation network" (* poster presenter).

**Israel** **Israeli Society of Plant Sciences** meeting, Sde Boker, Israel, Jan 24, 2011, Tzfadia, O.*, Bradbury, L.M.T., Ma'ayan, A., Shamir, R., Wurtzel, E.T., "Systems biology approach for the discovery of a provitamin A carotenoid biosynthesis transcriptional regulation network" (* poster presenter).

**California** **Gordon Research Conference** on Metals in Biology, Ventura, Jan 30-Feb 4, 2011, Wurtzel, E.T.*, Chen, Y., Shumskaya, M., and Beltrán, J. "A new enzyme for plant carotenoid biosynthesis recruited from bacterial denitrification" (*poster presenter).

**2010**

**Scotland** **International Conference on Systems Biology**, Edinburgh, Scotland, Oct 10-16, 2010, Tzfadia, O.*, Bradbury, L.M.T., Ma'ayan, A., Shamir, R., Wurtzel, E.T., "Systems biology approach for the discovery of a provitamin A carotenoid biosynthesis transcriptional regulation network" (* poster presenter and *GENESYS Poster Awardee*).

**Japan** **21st International Conference on Arabidopsis Research**, Yokohama Japan, June 6-10, 2010, Mann, V.*, Gafni, C., Glasner, S., Wurtzel, E., Zamir, D., Hirschberg, J. "The tomato mutant

*ZETA* encodes a novel enzyme essential for carotenoid biosynthesis in plants" (* poster presenter).

**California** **Gordon Research Conference** on Carotenoids, Ventura, Jan 17-22, 2010, Chen, Yu* and Wurtzel, E.T. "New gene tools for metabolic engineering of plant carotenoids" (*primary speaker for talk).

**California** **Gordon Research Conference** on Carotenoids, Ventura, Jan 17-22, 2010, Cuttriss, A.J.*, Li, F. Christopher, D. and Wurtzel, E.T. "Carotenogenesis and stress response in maize and Arabidopsis" (poster presenter).

**2009**

**New Hampshire** **Gordon Research Conference**-Graduate Research Seminar on Plant Metabolic Engineering, Waterville Valley, July 12-17, 2009, Tzfadia, O.* and Wurtzel, E.T.,"Application of systems biology computational tools for discovery of provitamin A carotenoid biosynthesis transcriptional regulation" (*speaker and poster presenter).

**Hawaii** Annual meeting of the **American Society of Plant Biologists** Plant Biology 2009, Honolulu, July 18-22, 2009, Cuttriss, A.*, Li, F., Christopher, D., and Wurtzel, E.T., "Carotenogenesis and stress response in maize and Arabidopsis" (*poster presenter).

**2008**

**Washington D.C.** **Maize Genetics Conference**, Feb. 27- Mar. 2, 2008, Vallabhaneni, R.V.*, Li, F., Rocheford, T., and Wurtzel, E. T., "Natural genetic diversity as a tool towards metabolic engineering strategies to improve or modulate endosperm carotenogenesis." (*poster presenter).

**2007**

**New Hampshire** **Gordon Research Conference** on **Plant Metabolic Engineering**, Tilton, July 15-20, 2007, Vallabhaneni, R.V.*, Li, F., Rocheford, T., and Wurtzel, E.T., "Timing biosynthetic potential of pro-vitamin A accumulation in a maize genetic diversity panel" (poster presenter*).

**New Hampshire** **Gordon Research Conference** on **Plant Metabolic Engineering**, Tilton, July 15-20, 2007, Li, F.*, Murillo, C., and Wurtzel, E.T. "The revised carotenoid biosynthetic pathway in plants" (poster presenter*).

**New Hampshire** **Gordon Research Conference** on **Plant Metabolic Engineering**, Tilton, July 15-20, 2007, Quinlan, R*. and Wurtzel, E.T., "Development of *E. coli* functional complementation system to test substrate specificity of carotene hydroxylases" (poster presenter*).

**New Hampshire** **Gordon Research Conference-Graduate Research Seminar** on **Plant Metabolic Engineering**, Tilton, July 13-15, 2007, Vallabhaneni, R.V.*, Li, F., Rocheford, T., and Wurtzel, E.T., "Timing biosynthetic potential of pro-vitamin A accumulation in a maize genetic diversity panel" (poster presenter* and winner of **ASPB best poster award**).

**New Hampshire** **Gordon Research Conference-Graduate Research Seminar** on **Plant Metabolic Engineering**, Tilton, July 13-15, 2007, Li, F.*, Murillo, C., and Wurtzel, E.T., "The revised carotenoid biosynthetic pathway in plants" (poster presenter*).

**New Hampshire** **Gordon Research Conference-Graduate Research Seminar** on **Plant Metabolic Engineering**, Tilton, July 13-15, 2007, Quinlan, R*. and Wurtzel, E.T., "Development of *E. coli* functional complementation system to test substrate specificity of carotene hydroxylases" (poster presenter*).

**Illinois** **Maize Genetics Conference**, St. Charles, March 22-25, 2007, Stevens, R.*, Dias de Carvalho, I., Bermudez Kandianis, C., Wurtzel, E., Buckler, E.S., Rocheford, T.R., "Strategies for Reaching Targets of Maize Kernel Carotenoid Content Using Visual Selection and Molecular Markers" (*poster presenter).

**2005**

**Washington** Annual Meeting of the **American Society of Plant Biology** Plant Biology 2005, Seattle, July 16-20, 2005, Vallabhaneni, R., Cervantes-Cervantes, M. and Wurtzel, E. T., "Promiscuous enzymes in isoprenoid biosynthesis: functional screening vs. data mining" (poster).

**New Hampshire** **Gordon Research Conference** on **Plant Metabolic Engineering**, Tilton, July 10-15, 2005, Quinlan, R. F, Jaradat, T. T., and Wurtzel, E. T., "Discovery of a new enzyme in carotenoid biosynthesis" (poster).

**New Hampshire** **Gordon Research Conference** on **Plant Metabolic Engineering**, Tilton, July 10-15, 2005, Vallabhaneni, R., Cervantes-Cervantes, M. and Wurtzel, E. T., "Promiscuous enzymes in isoprenoid biosynthesis: functional screening vs. data mining" (poster).

**New Hampshire** **Gordon Research Conference** on **Plant Metabolic Engineering**, Tilton, July 10-15, 2005, Li, F., Murillo, C. and Wurtzel, E. T., "How is carotenoid biosynthesis regulated in green tissue of maize?" (poster).

**New Hampshire** **Gordon Research Conference** on **Plant Metabolic Engineering**, Tilton, July 10-15, 2005, Harjes, C.*, Yates, H., Rocheford, T., Wurtzel, E. T., Buckler, E., "Characterization of maize kernel carotenoid diversity and identification of functionally distinct alleles by association mapping" (* presenter, short talk and poster).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 10-13, 2005, Harjes, C., Yates, H., Rocheford, T., Wurtzel, E. T., Buckler, E., "Diversity in maize kernel carotenoid content" (poster).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 10-13, 2005, Jaradat, T.T., Gallagher, C.E.*, Vallabhaneni, R., Licciardello, N., and Wurtzel, E.T., "Characterization of the maize gene family encoding β-carotene hydroxylase (di-iron monoxygenase type) (poster).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 10-13, 2005, Quinlan, R.F., Jaradat, T.T, and Wurtzel, E.T. "Characterization of the P450 carotene hydroxylase gene families in cereal crops" (poster).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 10-13, 2005, Vallabhaneni, R., Li, F., Murillo, C., and Wurtzel, E.T., "Mining genome data to reconstruct gene families controlling plastid isoprenoid biosynthesis in the Poaceae" (poster).

**2004**

**New York** **AMPS Urban University Conference,** Lehman College, CUNY, 4/23/04, Grand, I.* and Wurtzel, E. T., "Genes behind the vitamins in our food" (poster presenter*).

**New York** **AMPS Urban University Conference,** Lehman College, CUNY, 4/23/04, Gallagher, C.E., Matthews, P.D., Li, F., Zhu, C., Murillo, C.*, and Wurtzel, E.T., "Gene duplication in the carotenoid biosynthetic pathway preceded evolution of the grasses (Poaceae)" (poster presenter*).

**New York** **AMPS Urban University Conference,** Lehman College, CUNY, 4/23/04, Murillo, C.*, Gallagher, C., and Wurtzel, E.T., "Profiling endosperm carotenoids by HPLC "(poster presenter*).

**Mexico** **Maize Genetics Conference**, March 11-14, 2004, Gallagher, C.E., Matthews, P.D., Li, F., Zhu, C., Murillo, C.*, and Wurtzel, E.T., "Gene duplication in the carotenoid biosynthetic pathway preceded evolution of the grasses (Poaceae)" (poster presenter*).

**Mexico** **Maize Genetics, Genomics, and Bioinformatics Workshop**, CIMMYT, "Murillo, C.*, Gallagher, C., and Wurtzel, E.T., "Profiling endosperm carotenoids by HPLC" (poster presenter*).

**2003**

**California** **Gordon Research Conference** on **Carotenoids**, Ventura, Jan. 4-9, 2004, Gallagher, C.E., Matthews, P.D., Li, F., Zhu, C., and Wurtzel, E.T., "Gene duplication in the carotenoid biosynthetic pathway preceded evolution of the grasses (Poaceae)" (poster).

**New York** **AMPS Urban University Conference,** Lehman College, CUNY, 2003, Gallagher, C.E., Licciardello, N., Murillo, C.I., Wurtzel, E. T., "One gene family that may influence maize endosperm beta-carotene content" (poster*).

**Hawaii** Annual Meeting of the **American Society of Plant Biology** Plant Biology 2003, Honolulu, July 25-Aug. 1, 2003, Cervantes-Cervantes*, M. and Wurtzel, E.T., "Isoprenoid biosynthesis in maize: is there more than one role for FPPS?" (poster presenter*).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 13-17, 2003, Gallagher, C.E.*, Licciardello, N., Murillo, C.I., Matthews, P.D., and Wurtzel, E.T. "Characerization of gene families that influence maize endosperm carotenoid content" (speaker*).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 13-17, 2003, Gallagher, C.E., Licciardello, N., Murillo, C.I., Wurtzel, E. T. (2003) One gene family that may influence maize endosperm betacarotene content. Maize Genetics Conference, March 13-17, 2003, Lake Geneva, Wisconsin. (poster).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 13-17, 2003, Li, F., Gallagher, C.E.*, Matthews, P.D., and Wurtzel, E.T., "A maize *Y1* homolog encodes a functional phytoene synthase" (poster).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 13-17, 2003, Licciardello, N.*, Gallagher, C.E., Cervantes-Cervantes, M., and Wurtzel, E. T., "Color complementation in *E. coli* for functional testing of a cDNA required for maize carotenoid biosynthesis" (*undergraduate student poster presenter).

**New York** **New York Area Plant Molecular Biology Meeting**, The New York Botanical Garden, 1/18/03, Gallagher, C.E.*, Licciardello, and Wurtzel, E.T., "Characterization of gene families encoding enzymes for carotenoid and isoprenoid biosynthesis in maize" (*speaker).

**New York** **New York Area Plant Molecular Biology Meeting**, The New York Botanical Garden, 1/18/03, Licciardello, N.*, Gallagher, C.E., Cervantes-Cervantes, M., and Wurtzel, E. T., "Characterization and functional analysis of a maize cDNA encoding betacarotene hydroxylase" (*undergraduate student poster presenter).

**2002**

**New York** **Society of Economic Botany** meeting, The New York Botanical Garden, June 22-26, 2002, Gallagher*, C.E., Licciardello, N., Matthews, P.D., and Wurtzel, E.T., "Characterization of gene families encoding enzymes for carotenoid and isoprenoid biosynthesis in maize" (*poster presenter).

**New York** **Sigma Xi**, Lehman College Chapter, 5/8/02, Licciardello*, N., Gallagher, C.E., Cervantes-Cervantes, M., and Wurtzel, E.T. (2002) Characterization and functional analysis of a maize cDNA encoding betacarotene hydroxylase" (*undergraduate student poster presenter).

**Florida** **Maize Genetics Conference**, Orlando, March 14-17, 2002, Gallagher*, C.E., Licciardello, N., Matthews, P.D., and Wurtzel, E.T., "Characterization of gene families encoding enzymes for carotenoid and isoprenoid biosynthesis in maize" (*poster).

**Florida** **Maize Genetics Conference**, Orlando, March 14-17, 2002, Cervantes-Cervantes*, M., Li, F., Vallabhaneni, R., and Wurtzel, E.T., "Characterization of the maize gene family encoding geranylgeranyl pyrophosphate synthase, a key enzyme in biosynthesis of plant isoprenoids" (*poster).

**Florida** **Maize Genetics Conference**, Orlando, March 14-17, 2002, Licciardello*, N., Gallagher, C.E., Cervantes-Cervantes, M., and Wurtzel, E.T., "Characterization and functional analysis of a maize cDNA encoding betacarotene hydroxylase" (*undergraduate student poster presenter).

**New Jersey** **New York Area Plant Molecular Biology Meeting**, Rutgers University, New Brunswick, 1/19/02, Matthews*, P.D. and Wurtzel, E.T., "Maize phytoene desaturase (PDS) and zeta-carotene desaturase (ZDS) produce poly-Z-lycopene: Implications for genetic manipulation of carotenogenesis in maize and rice" (*speaker).

**Hawaii** **13th International Carotenoid Symposium,** Honolulu, Jan. 6-11, 2002, Gallagher, C. E., Cervantes-Cervantes, M., and Wurtzel, E.T., "Isolation of a maize cDNA encoding an inhibitor of carotenoid accumulation" (poster).

**Iowa** **Symposium on Functions and Actions of Retinoids and Carotenoids: Building on the Vision of James Allen Olson**, Iowa State University, Ames, June 21-24, 2001, Gallagher, C.E.*, Cervantes-Cervantes, M. and Wurtzel, E.T., "A novel homolog of *Bt2*, the small subunit of ADP Glucose Pyrophosphorylase, inhibits carotenoid accumulation" (*poster presenter).

**2001**

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 14-18, 2001, Gallagher, C.E., Cervantes-Cervantes, M. and Wurtzel, E.T., "A novel homolog of Bt2, the small subunit of ADP Glucose Pyrophosphorylase, inhibits carotenoid accumulation" (poster).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 14-18, 2001, Cervantes, M. and Wurtzel, E.T., "Characterization of the maize geranylgeranyl pyrophosphate synthase (GGPPS) gene family" (poster).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 14-18, 2001, Matthews, P.D.* and Wurtzel, E.T., "Cloning and characterization of a *phytoene synthase* (*Psy*) gene from rice and comparison to maize *Y1*" (*poster).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 14-18, 2001, Matthews, P.D.* and Wurtzel, E.T., "Maize phytoene desaturase (PDS) and zeta-carotene desaturase (ZDS) produce poly-*Z*-lycopene: Implications for genetic manipulation of carotenogenesis in maize and rice" (*poster presenter and speaker).

**Cold Spring Harbor** **New York Plant Molecular Biology Meeting**, Cold Spring Harbor Laboratory**,** 1/13/01, Cervantes, M.*, Ratnayaka, S., and Wurtzel, E.T., "Temporal expression of the geranylgeranyl pyrophosphate synthase gene in developing maize endosperm and preliminary determination of gene copy number" (*poster).

**2000**

**California** **Annual Meeting of the American Society of Plant Physiologists**, San Diego, July 15-19, 2000, Cervantes, M.*, Ratnayaka, S., and Wurtzel, E.T., "Temporal expression of the geranylgeranyl pyrophosphate synthase gene in developing maize endosperm and preliminary determination of gene copy number" (*poster)

**New York** **New York Plant Molecular Biology Meeting**, New York University, 1/22/00, Matthews, P.D. * and Wurtzel, E.T., "Tissue specific expression of carotenoids in maize anthers" (*speaker).

**Idaho** **Maize Genetics Conference**, Coeur d'Alene, March 16-19, 2000, Wurtzel, E. T., Matthews, P.D., and Mudalige, R., "A heterologous system to identify strategic genes for metabolic engineering of the maize carotenoid biosynthetic pathway" (poster).

**Idaho** **Maize Genetics Conference**, Coeur d'Alene, March 16-19, 2000, Cervantes-Cervantes, M., Ratnayaka, S, and Wurtzel, E. T., "Preliminary characterization of the geranylgeranylpyrophosphate synthase (GGPPS) gene family of maize" (poster).

**1999**

**Australia** **Twelfth International Symposium on Carotenoids**, Cairns, July 18-23, 1999, Yu, J. and Wurtzel, E.T.*, "Immunolocalization of carotenoid enzymes in maize endosperm" (poster, short talk).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 11-14, 1999, Cervantes-Cervantes, M., and Wurtzel, E.T., "Isolation of geranylgeranylpyrophosphate synthase (GGPPS) cDNA clones from maize endosperm by color complementation in *Escherichia coli*" (poster).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 11-14, 1999, Cota, C.*, Matthews, P.D. and Wurtzel, E.T., "Development of rice transformation for analysis of maize transgenes" (*undergraduate student poster presenter).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 11-14, 1999, Yu, J. and Wurtzel, E.T., "Immunolocalization of carotenoid enzymes in maize" (poster).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 11-14, 1999, Matthews, P.D., Cota, C.P. and Wurtzel, E.T., "On golden pollen" (poster).

**1998**

**New York** **National Minority Research Symposium**, New York City, November 21-24, 1998, Cota, C.*, Matthews, P.D., and Wurtzel, E.T., "Remediating vitamin A deficiency through biotechnology" (*undergraduate student poster presenter).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 19-22, 1998, Wurtzel, E.T. and Luo, R., "Endosperm carotenoid biosynthesis" (poster).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 19-22, 1998, Li, Z., and Wurtzel, E.T., "Do members of the *Itk* gene family transduce signals for endosperm development?" (poster).

**Wisconsin** **Maize Genetics Conference**, Lake Geneva, March 19-22, 1998, Matthews, P.D., Ronelus, W., Cota, C.P., Rovira, I., Cervantes, M., Upasani, V., and Wurtzel, E.T., "Comparison of maize and rice phytoene synthases" (poster).

**1997**

**California** **Gordon Research Conference** on **Carotenoids**, Ventura, Jan. 25-30, 1998, Wurtzel, E.T. and Luo, R., "Endosperm carotenoid biosynthesis" (poster).

**New York** **The Arthur Cronquist CUNY Plant Sciences Symposium**, Lehman College, CUNY, 11/8/97, Wurtzel, E.T., Yoganathan, A., Yu, J., Li, Z., Luo, R., Matthews, P., Upasani, V., Yang, Y., Shcherbina, A., Ronelus, W., Smith A., and Adeleye, T., "Regulation of carotenoid biosynthesis in seed endosperms" (poster).

**New York** **The Arthur Cronquist CUNY Plant Sciences Symposium**, Lehman College, CUNY, 11/8/97, Li, Z.-h., Yang. Y., and Wurtzel, E.T., "A novel leucine-rich repeat transmembrane protein kinase of maize" (poster).

**Singapore** **5th International Congress of Plant Molecular Biology**, Singapore City, Sept. 21-27, 1997, Wurtzel, E.T., Yoganathan, A., Yu, J., Li, Z., Luo, R., Matthews, P., Upasani, V., Yang, Y., Shcherbina, A., Ronelus, W., Smith A., and Adeleye, T., "Regulation of carotenoid biosynthesis in seed endosperms" (poster).

**Singapore** **5th International Congress of Plant Molecular Biology**, Singapore City, Sept. 21-27, 1997, Li, Z.-h., Yang. Y., and Wurtzel, E.T., "A novel leucine-rich repeat transmembrane protein kinase of maize" (poster).

**Malaysia** **General Meeting of Rockefeller Foundation International Program on Rice Biotechnology**, Malacca, Sept. 15-19, 1997, Wurtzel, E.T. Yoganathan, A., Yu, J., Li, Z., Luo, R., Matthews, P., Upasani, V., Yang, Y., Shcherbina, A., Ronelus, W., Smith A., and Adeleye, T., "Research towards metabolic engineering of provitamin A carotenoids in rice endosperm (poster).

**Malaysia** **General Meeting of Rockefeller Foundation International Program on Rice Biotechnology**, Malacca, Sept. 15-19, 1997, Upasani, V., Li, Z., Yoganathan, A., Luo, R., and Wurtzel, E.T., "Screening of rice bacterial artifical chromosome (BAC) libraries for carotenogenic genes" (poster).

**Malaysia** **General Meeting of Rockefeller Foundation International Program on Rice Biotechnology**, Malacca, Sept. 15-19, 1997, Li, Z.-h., Yang. Y., and Wurtzel, E.T., "A novel leucine-rich repeat transmembrane protein kinase of maize" (poster).

**Florida** **Maize Genetics Conference**, Clearwater Beach, March 13-16, 1997, Li, Z.-h.*, Yang., Y., and Wurtzel, E.T., "A novel leucine-rich repeat transmembrane protein kinase of maize" (*speaker and poster presenter).

**Florida** **Maize Genetics Conference**, Clearwater Beach, March 13-16, 1997, Luo, R.-b., Burr, B., and Wurtzel, E.T., "Isolation of a cDNA encoding maize ZDS, the carotenoid biosynthetic enzyme, zetacarotene desaturase" (poster).

**New York** **New York Area Plant Molecular Biology Meeting**, Lehman College, CUNY, Jan. 25, 1997, Li, Z.-h.*, Yang., Y., and Wurtzel, E.T., "Ltk1: a novel leucine -rich-repeat transmembrane protein kinase of maize" (*speaker).

**New York** **New York Area Plant Molecular Biology Meeting**, Lehman College, CUNY, Jan. 25, 1997, Luo, R.-b.*, and Wurtzel, E.T., "Carotenoid biosynthesis in maize" (*speaker).

**India** **Fifth Annual Meeting of the National Rice Biotechnology Network**, New Delhi, Nov. 13-16, 1996, Upasani, V.N.*, Li, Z.-h., Yoganathan, A., Wurtzel, E.T., "Isolation of rice BAC genomic DNA clones encoding carotenoid biosynthetic enzymes" (*poster presenter).

**Italy** **Ninety-First Meeting of the Italian Botanical Society**, Ancona, 9/96, Caputo, P.*, Moretti, A., Siniscalco-Gigliano, G., Stevenson, D.W., Wurtzel, E.T., "R-DNA systematics in *Ceratozamia* (Zamiaceae, Cycadales)" (*poster presenter).

**New Jersey** **New York Area Plant Molecular Biology Meeting**, Rutgers University, 6/8/96, "Yoganathan, A.* and Wurtzel, E.T., "Research towards engineering pro-vitamin A in rice endosperm" (* speaker).

**Illinois** **Maize Genetics Conference**, St. Charles, March 14-17, 1996, Li, Z. and Wurtzel, E.T., "Is there a second copy of the phytoene desaturase gene in maize?" (poster).

**Illinois** **Maize Genetics Conference**, St. Charles, March 14-17, 1996, Luo, R.-b. and Wurtzel, E.T., "The role of quinones in maize carotenoid biosynthesis" (poster).

**Illinois** **Maize Genetics Conference**, St. Charles, March 14-17, 1996, Valdez, G., Matthews, P.D., and Wurtzel, E.T., "Variation in accumulation of carotenoids in *E. coli* strains" (poster).

**Illinois** **Maize Genetics Conference**, St. Charles, March 14-17, 1996, Yu, J., Li, Z., Buckner, B., and Wurtzel, E. T., "Endosperm carotenoid biosynthesis and expression of PSY" (poster).

**Illinois** **Maize Genetics Conference**, St. Charles, March 14-17, 1996, Yoganathan, A., Luo, R., Yu, J., Li, Z., Zhou, Z. and Wurtzel, E.T., "Research towards improvement endosperm carotenoids" (poster).

**1995**

**New York** **Second Annual Science Poster Session**, The Graduate School and University Center, The City University of New York, 11/1/95, Wurtzel, E.T. Li, Z., Luo, R.*, Matias, D., Mozoub, D., Matthews, P.D., Upasani, V., Valdez, G., Yoganathan, A., Yu, J., "Research towards improvement of the pro-vitamin A (carotenoid) content of rice endosperm" (*poster presenter).

**Philippines** **Third International Rice Genetics Symposium,** Manila, October 16-29, 1995, Wurtzel, E.T., Li, Z., Luo, R., Matias, D., Mozoub, D., Matthews, P.D., Upasani, V., Valdez, G., Yoganathan, A., and Yu, J., "Research towards improvement of the pro-vitamin A (carotenoid) content of rice endosperm" (poster).

**Kentucky** **International Symposium on engineering plants for commercial products and applications**, Lexington, October 1-4, 1995, Yoganathan, A.*, Li, Z., Luo, R., Matias, D., Mozoub, D., Matthews, P.D., Upasani, V., Valdez, G., Yu, J, and Wurtzel, E.T., "Research towards improvement of the pro-vitamin A (carotenoid) content of rice endosperm" (poster presenter).

**California** **Maize Genetics Conference**, Asilomar, March 16-19, 1995, Matthews, P. D., Yu, J., Li, Z., Yoganathan, A., Valdez, G., Basile, M., and Wurtzel, E. T., "Higher plant homologs of bacterial phytoene desaturase" (poster).

**California** **Maize Genetics Conference**, Asilomar, March 16-19, 1995, Mozoub, D.*, Li, Z., Buckner, B., and Wurtzel, E.T., "High carotenoid accumulation in maize endosperm correlates with a unique allele of *y1* (*undergraduate student poster).

**California** **Maize Genetics Conference**, Asilomar, March 16-19, 1995, Matias, D.J.*, Yu J., and Wurtzel, E.T., "Are carotenoid desaturase mutants deficient in oxidoreductase activity?" (*undergraduate student poster).

**California** **Maize Genetics Conference**, Asilomar, March 16-19, 1995, Yoganathan, A., Buckner, B., and Wurtzel, E.T., "Heterologous complementation in *E. coli* to demonstrate that maize *Y1* encodes phytoene synthase" (poster).

**California** **Maize Genetics Conference**, Asilomar, March 16-19, 1995, Yu, J., Buckner, B., and Wurtzel, E.T., "Phytoene synthase is rate-limiting in endosperm carotenoid biosynthesis" (poster).

**California** **Maize Genetics Conference**, Asilomar, March 16-19, 1995, Li, Z., Luo, R., Matthews, P., Burr, B., and Wurtzel, E.T., "Cloning and expression of maize phytoene desaturase, the product of the *vp5* locus" (poster).

**NewYork** **National Minority Research Symposium** (MBRS/ MARC/ AMP/ BRIDGE/ CORE/ MIRDP) regional conference, 2/25/95, Matias, D.J.*, Yu J., and Wurtzel, E.T., "Oxidoreductase activities in maize endosperm" (*undergraduate student poster).

**1994**

**New York** **New York Area Plant Molecular Biology Symposium**, New York University, 1/14/95, Li, Z.* and Wurtzel, E.T., "Regulation of carotenoid biosynthesis in maize" (* speaker).

**South Carolina** **National Minority Research Symposium**, Hilton Head, Dec. 14-18, 1994, Matias, D.J.*, Yu J., and Wurtzel, E.T., "Oxidoreductase activities in maize endosperm" (*undergraduate student poster).

**Georgia** Annual meeting for the **Society for Molecular Biology and Evolution**, U. Georgia, June 15-19, 1994, Stabile, J., Wurtzel, E.T., and Gallagher, J., "Patterns of divergence among natural populations of the marine diatom, *Skeletonema costatum* using chloroplast DNA and allozyme data" (poster).

**Indonesia** **Rockefeller Foundation International Program on Rice Biotechnology**, 7th annual meeting, Bali, May 16 - 21, 1994, Wurtzel, E.T., Li, Z.-h. Matthews, P.D., Yoganathan, A., and Yu, J., "Research towards improvement of the carotenoid content of rice endosperm" (poster).

**1993**

**Georgia** **National Institute of General Medical Sciences** Minority Programs Symposium, Atlanta, November 3-7, 1993, Matias, D.J.*, Yu, J., and Wurtzel, E.T., "Oxidoreductase activity in normal and carotenoid mutants of maize" (*undergraduate student poster).

**Georgia** **National Institute of General Medical Sciences** Minority Programs Symposium, Atlanta, November 3-7, 1993, Valdez, G.*, Matthews, P.D., Yu, J., Yoganathan, A., Li, Z., and Wurtzel, E.T., "Localization of bacterial phytoene desaturase homologs in plants" (*undergraduate student poster).

**Illinois** **Maize Genetics Conference**, St. Charles, March 18-21, 1993, Wurtzel, E.T., Matthews, P., Li, Z.-h, Yoganathan, A., Yu, J., Basile M., Bae K., Aslani, M., Matias, D., and Mozoub, D., "Comparison of gene expression in rice and maize carotenoid biosynthesis" (poster).

**Thailand** **Rockefeller Foundation International Rice Biotechnology Symposium**, ChangMai, Feb. 1-5, 1993, Wurtzel, E.T., Matthews, P., Li, Z.-h, Yoganathan, A., Yu, J., Basile M., Bae K., Aslani, M., Matias, D., and Mozoub, D., "Comparison of gene expression in rice and maize carotenoid biosynthesis" (poster).

**South Africa** **Cycad '93**, South Africa, 1993, De Luca, P.*, Moretti A., Siniscalco Gigliano, G., Caputo, P., Cozzolino S., Gaudio, L., Stevenson, D.W., Wurtzel, E.T., and Osborne, R., "Molecular systematics of cycads" (*poster presenter).

**1992**

**California** **Gordon Research Conference** on **Carotenoids**, Oxnard, March 9-13, 1992, Wurtzel, E.T., "Use of a transposable element to examine expression of a maize carotenoid gene, *Vp5*" (poster).

**California** **Gordon Research Conference** on **Carotenoids**, Oxnard, March 9-13, 1992, Wurtzel, E.T., Matthews, P.D., Yu J., Z.-h. Li, and Yoganathan, A., "Molecular genetics of phytoene desaturation in maize" (poster).

**Italy** **Eighty-Seventh Italian Botanical Congress**, 1992, Moretti, A.*, Caputo, P., Siniscalso Gigliano, G., Cozzolino S., Stevenson, D., and Wurtzel, E.T., "A phylogenetic analysis of *Ceratozamia* brogn. (Zamiaceae, Cycadales)" Giornale Botanico Italiano, 126 (2):294 (*poster presenter).

**1991**

**USA** **American Chemical Society Meeting**, 1991, Philipp, M.*, Wurtzel, E.T., and Dougherty, C., "Project SEED at Lehman College" (*poster presenter).

**New Jersey** **New York Area Plant Molecular Biology Symposium**, Waksman Institute, Rutgers University, 1/91, Caputo, P.* and Wurtzel, E.T., "Studies on chloroplast DNA variation in cycads" (*speaker).

**1990**

**Australia** **Second International Congress of Cycad Biology**, **Cycad '90**, 7/90, Caputo, P.*, and Marquis, C. and Wurtzel, E.T., "Molecular analysis as a tool for cycad phylogenetic studies" (*poster presenter).

**Australia** **Second International Congress of Cycad Biology**, **Cycad '90**, Caputo, P.*, Stevenson, D., and Wurtzel, E.T., "Molecular analysis of cycad chloroplast evolution" (*invited speaker).

**Italy** **Eighty-Fifth Italian Botanical Congress**, Naples, Oct. 1990, Caputo, P., Stevenson, D., Moretti, A., and Wurtzel, E.T., "A phylogenetic analysis of cycads using chloroplast DNA restriction fragment length polymorphisms," Giornale Botanico Italiano, 124:124 (poster).

**Italy** **Eighty-Fifth Italian Botanical Congress**, Naples, Oct. 1990, Siniscalso Gigliano, G.*, Caputo, P., Gaudio L., Moretti, A., Cozzolino S., Tate, R. and Wurtzel, E.T., "Polimorphismi di restrizione nel DNA plastidiale e filogenesi infragenerica delle cycadales," Giornale Botanico Italiano, 124:134 (*poster presenter).

**Maryland** **Phycological Society of America Meeting**, July 1990, Stabile, J.E., Gallagher, J.C.*, and Wurtzel, E.T., "Intraspecific variation in the chloroplast DNA of the marine diatom *Skeletonema costatum*" (*poster presenter).

**California** **Eleventh International Diatom Symposium**, Aug 1990, Stabile, J.E., Gallagher, J.C.*, and Wurtzel, E.T. (1990) Intraspecific variation in the chloroplast DNA of the marine diatom *Skeletonema costatum*" (*poster presenter).

**Tennessee** **National Institutes of Health** MBRS-MARC Symposium, Nashville, Oct. 1990, Goldman, T.I.*, Matthews, P.D., Rattiner, C., and Wurtzel, E.T., "Physical characterization of plant genomes" (*undergraduate student poster).

**1989**

**Wisconsin** **Maize Genetics Conference**, Delevan, March 2-5, 1989, Bass, H.W.*, Goode, J.H., Wurtzel, E.T., and Boston, R.S., "Developmental regulation of *b-32* in normal and mutant lines of maize" (*poster presenter).

**1988**

**Wisconsin** **Maize Genetics Conference**, Madison, 1988, Wurtzel, E.T. and Matthews, P.D., "*Ds*-chromosome breaking elements: Testing the feasibility of tagging genes with maize controlling elements" (poster).

**California** **National Institutes of Health** MBRS-MARC Symposium, Los Angeles, Oct. 12-16, 1988, Vernon, J.*, Matthews, P.D., Cai, Y., Marquis, C.*, Williams, P., and Wurtzel, E.T., "Transposon tagging in tomato?" (*undergraduate student poster).

**1976-1982**

**Texas** **American Society for Microbiology Meeting**, 1982, Mizuno, T., Wurtzel, E.T., Chou, M.-Y., Ramdev, G., and Inouye, M., "Cloning of the *ompB* locus consisting of two genes (*ompR* and *envZ*) of *E. coli*".

**Netherlands** **Lunteren Lectures on Molecular Genetics**, 1980, Inouye, M., Nakamura, K., Movva, R., Yamagata, H., Maeda, T., Inukai, M., Wurtzel, E., Green, P., Ching, G., Coleman, J., Oren, R., Zwiebel, L. and Hirashima, A., "Biosynthesis of outer membrane proteins in gram-negative bacteria."

**Cold Spring Harbor** **Membrane Biogenesis Meeting**, Cold Spring Harbor Laboratory, 1979, Inouye, M.*, DiRienzo, J. Maeda, T., Nakamura, K., Pirtle, R., Pirtle, I., Movva, R., and Wurtzel, E., "Biosynthesis and assembly of outer membrane proteins of *E. coli*" (*presenter).

**Germany** **Tenth International Congress of Biochemistry**, Hamburg, 1976, Inouye, M., Halegoua, S., Sekizawa, J., Wang, S., Small, M., Katz, E., Yasamura, M., Takeishi, K., and Pirtle, R., "Mechanism of biosynthesis of a lipoprotein from the outer membrane of *E. coli.*" (poster).

**OTHER CONTRIBUTIONS:**

Photo credit in ***Plant Biotechnology, A Laboratory Manual*** by R. J. Lebowitz, William C. Brown, Publishers, 1995 (photos pages 60-61).

**Founding member, ASPB Legacy Society** (2016): see biography with advice for early career scientists on career planning (2021): https://aspb.org/wp-content/uploads/2021/03/Legacy-Society-Founding-Members-Eleanore-Wurtzel.pdf

**INVITED POPULAR TALKS (selected)**

**May 3, 2010** **CUNY Science Café: "**Unlocking molecular secrets in food crops to eradicate global malnutrition." (http://urdox1.cuny.edu/research/Serving-Science-CUNY-Science-Cafe.html)

**INDUSTRIAL COLLABORATIONS:**

**1996** "TUSC Collaborative research agreement" with Pioneer Hy-Bred International, Inc., Johnston, IA

**GRANTS:**

Note: Research funding of ~$8 million, including >25 years of continuous **NIH** support. Other funding received from **NSF**, **American Cancer Society**, **Rockefeller Foundation** International Rice Biotechnology Program, **McKnight Foundation**, **USDA**, **DOD**, **DOE**, **NASA**, New York State, and industry.

$ 3000 **PSC-CUNY** Chairs Fund *9/1/2024 - 8/31/2026* (RF#*6D238-00 05) to further the scholarly activities of the department chair*

$ 3000 **PSC-CUNY** Chairs Fund (*9/1/2023 - 8/31/2025) (RF# 6D238-00 04) to further the scholarly activities of the department chair*

$ 3000 **PSC-CUNY** Chairs Fund (9/1/22- 8/31/23 (RF# *6D238-00 03) to further the scholarly activities of the department chair*

$ 3500 **PSC-CUNY Research Award Program** (TRADA-52-26) 7/1/21-6/30/22 (award # 64022-00 52)
The chemistry behind the camouflage of the stick and leaf insects.

$ 5000 **CUNY Institute for Macromolecular Assemblies (MMA)** (March 2021)
Support for carotenoid research supplies

$32,000 **Huazhong Agricultural University** (2019-2020), to support Kaijie Zhu, visiting doctoral student, Dr. Xiuxin Deng, Professor, Key Laboratory of Horticultural Plant Biology (Ministry of Education), College of Horticulture and Forestry Sciences Huazhong Agricultural University, Wuhan, China (http://ics.hzau.edu.cn/ics/content/en/2p001.html)

$57,179 **CUNY GRTI program** (2018)
Replacement of ultracentrifuge and rotors in the Wurtzel lab

$10,000 **iHUB Start-Up Fellowship** /CUNY Office of Research (9/1/2017-8/31/2018)
Designer Crops for Climate Change.

$13,921 **CUNY equipment grant**
(9/22/2014-6/30/2015) Refrigerated table top centrifuge

$50,000 **CUNY/ LEHMAN Bridge program**
(9/1/2013-present) Elucidating how a novel isomerase controls provitamin A carotenoid biosynthesis.

$119,627.77 **2013 Gordon Research Conference on Carotenoids** [Jan 6-11,2013, Ventura, CA] **Chair: Eleanore Wurtzel; Co-chair: Xiang-Dong Wang (Tufts U,); Vice chair- Johannes von Lintig (Case Western Reserve U.); 2013 GRC** Gordon Keenan Seminar on Carotenoids for early career scientists [Jan 5-6, 2013, Ventura, CA] **Chair: Jaime Amengual Terrasa (Case Western Reserve U.); Co-Chair: Jesús Beltrán (Lehman College, CUNY)**

| | |
|---|---|
| PFIZER INC. | $50,000.00 |
| GORDON RESEARCH CONFERENCES | $27,447.77 |
| ABBOTT | $10,000.00 |
| NUTRITION SCIENCE & ADVOCACY | $10,000.00 |
| GORDON RESEARCH CONFERENCES- GRS | $5,000.00 |
| ASTAREAL, CO., LTD. | $2,980.00 |
| INTERNATIONAL CAROTENOID SOCIETY | $2,500.00 |
| LEHMAN COLLEGE, CUNY | $1,500.00 |

| | |
|---|---|
| HOWARD FOUNDATION | $1,500.00 |
| KEMIN INDUSTRIES, INC. | $1,500.00 |
| NUTRAQ | $1,500.00 |
| THE CITY UNIVERSITY OF NEW YORK | $1,500.00 |
| CARL STORM INTERNATIONAL DIVERSITY FELLOWSHIP | $1,250.00 |
| SOUTHCOT, INC. | $1,000.00 |
| GRC PREDOM UNDERGRADUATE INSTITUTE | $600.00 |
| CARL STORM UNDERREPRESENTED MINORITY FELLOWSHIPS | $600.00 |
| EPPENDORF | $500.00 |
| SYNGENE | $250.00 |
| **TOTAL** | **$119,627.77** |

**2011**

$12,838 **CUNY GRADUATE CENTER GRTI PROGRAM**
(2011-12) Bioimaging for Plant Biology

$10,000 **CUNY LEHMAN COLLEGE GRTI PROGRAM**
(2011-12) Gel Documentation system for molecular biology

$ 1,000 **LEHMAN COLLEGE RESEARCH CONFERENCE INCENTIVE PROGRAM**
(2011) for invited research presentation at the 16th International Symposium on Carotenoids (July 2011, Krakow, Poland)

**2009**

$ 328,717 **NATIONAL INSTITUTES OF HEALTH**
(9/8/09-6/30/11) (#3SC1GM081160-03S1) (ARRA, *American Recovery and Reinvestment Act of 2009*)
Regulation of maize proVitamin A carotenoid biosynthesis in maize.

$ 1,500 **LEHMAN COLLEGE- Excellence in Research, Scholarship and Creative Works Award** for 2009 in the Natural Sciences

**2007**

$ 1,404,000 **NATIONAL INSTITUTES OF HEALTH**
(9/07-2/28/13), 30 % T/E (renewal) (#GM081160)
Regulation of maize proVitamin A carotenoid biosynthesis in maize.

$ 5,000 **PSC-CUNY Research Award Program** #69573-00 38 (7/07-6/08) 5% time and effort Metabolic engineering of alpha-carotene in *Escherichia coli.*

**2005**

$ 1,000 **ASPB Travel Award for Plant Biology 2005** (Seattle, Washington, July 16-20, 2005)

$ 85,256 **2005 Gordon Research Conference on Plant Metabolic Engineering** [July 10-15, 2005, Tilton, NH**]**
**Chair: Eleanore Wurtzel; Vice-Chair: Erich Grotewold**

| | |
|---|---|
| GORDON RESEARCH CONFERENCES | $23,500.00 |
| CARL STORM UNDERREPRESENTED MINORITY FELLOWSHIPS | $3,000.00 |
| CARL STORM DIVERSITY FELLOWSHIP | $600.00 |
| DOE- **DEPARTMENT OF ENERGY** -ENERGY BIOSCIENCES (AWARD # DE-FG02-05ER15679) 7/1/05-6/30/06 | $10,000.00 |

| | |
|---|---|
| NIH- **NATIONAL INSTITUTES OF HEALTH** (NIGMS) (1R13GM074266-01) 5/1/05-4/30/06 | $3,000.00 |
| NASA- **NATIONAL SPACE AND AERONAUTICS ADMINISTRATION (**FISCAL YEAR 2005) | $9,500.00 |
| NSF- **NATIONAL SCIENCE FOUNDATION** (#BES-0514979) 6/15/05-5/31/06 | $6,000.00 |
| USDA- **UNITED STATES DEPT. OF AGRICULTURE** (#2005-35318-16209) 8/1/05-7/31/06 | $7,000.00 |
| ARCADIA BIOSCIENCES | $1,000.00 |
| AVESTHAGEN | $2,000.00 |
| BAYER BIOSCIENCE N.V. | $1,980.00 |
| BRUKER BIOSPIN CORPORATION | $250.00 |
| CERES, INC. | $1,000.00 |
| ICORIA, INC. | $500.00 |
| KEMIN HEALTH, L.C. | $1,500.00 |
| MONSANTO COMPANY | $2,000.00 |
| PIONEER HI-BRED INTERNATIONAL, INC. | $1,000.00 |
| PERFORMANCE PLANTS | $776.00 |
| SAMUEL ROBERTS NOBLE FOUNDATION, INC. | $2,000.00 |
| SYNGENTA | $2,000.00 |
| S.S. STEINER, INC. | $1,650.00 |
| TASMANIAN ALKALOIDS PTY. LTD. | $1,000.00 |
| THE CITY UNIVERSITY OF NEW YORK | $3,000.00 |
| WATERS CORPORATION | $1,000.00 |
| **TOTAL** | **$84,256.00** |

$ 3,500 **PSC-CUNY Research Award Program** #67121-00 36 (7/05-6/06) 5% time and effort
Characterization of the HYD gene family of maize

**2003**

$ 1,016,614 **NATIONAL INSTITUTES OF HEALTH**
(9/03-8/31/07), 30 % T/E (renewal) (#2S06GM008225-190015)
Regulation of maize proVitamin A carotenoid biosynthesis.

$ 3,103 **PSC-CUNY Research Award Program** (7/03-6/04) 5% time and effort
Functional characterization of a cereal carotene isomerase

**2001**

$ 94,776 **DOD** (Instrumentation and Research Support for HSIs)
(8/1/2001-1/31/2004) PI: Dr. E. Kennelly (Lehman College); Co-PIs: Dr. E. Wurtzel (Lehman College), Dr. T. Jensen (Lehman College)
Bringing the research environment to undergraduate classrooms through computer technology.

$300,000 **USDA** (Hispanic-Serving Institutions Grants Program)
(9/1/2001- 8/31/2004) 10 % T/E
PI: Dr. E. Kennelly; Lehman College, Co-PIs: Dr. E. Wurtzel, Lehman College and Dr. David Lentz, The New York Botanical Garden)
Bridging the digital divide in the Bronx through a plant biology partnership.

$74,000 **CUNY GRTI program**
(2001-2003) PI: Dr. Wurtzel; Co-PIs: Drs. Kennelly, Cheng, Jones, Aisemberg
Computer laboratory for Research in the Biological Sciences

**1999**

$ 1,003,074 **NATIONAL INSTITUTES OF HEALTH-SCORE** Research Grants Program,
(9/99-8/31/03), 25 % T/E ($703,983, direct costs)
Regulation of maize proVitamin A carotenoid biosynthesis.

$ 238,007 **USDA** (Hispanic-Serving Institutions Grants Program) (9/1/99-8/31/01)
(Dr. E. Kennelly and Dr. E. Wurtzel, Co-PIs (Lehman) with Dr. M. Cervantes-Cervantes, Co-PI (Hostos Community College)
Plant Biotechnology in the Bronx: Instrumentation Improvement and Curriculum Development.

$ 3,445 **PSC-CUNY Research Award Program** (7/99-6/00) 5% time and effort
Isolation and characterization of a maize cDNA encoding the carotenoid biosynthetic enzyme, betacarotene hydroxylase.

**1997**

$ 100,000 **THE ROCKEFELLER FOUNDATION INTERNATIONAL RICE BIOTECHNOLOGY PROGRAM (**6/97-12/99) 5% time and effort
Research towards metabolic engineering of provitamin A carotenoids in rice endosperm.
(RENEWAL)

$ 34,000 **CUNY Collaborative incentive grants program** (10/97-12/03) 10% time and effort
(Dr. E. Wurtzel, Lehman College, CUNY and Dr. M. Cervantes-Cervantes, Hostos Community College, CUNY)
Cloning and characterization of the GGPPS and LCY genes from maize endosperm.

**1996**

$ 11,456 **NATIONAL INSTITUTES OF HEALTH-Minority** Access to Research Careers at
Lehman College (MARC) (7/96-6/97) subproject investigator-
(undergraduate minority student support package)

$ 4,600 **PSC-CUNY** Research Award Program (7/96-12/97)
Isolation of a maize gene encoding the carotenoid biosynthetic enzyme, lycopene cyclase

**1995**

$ 100,000 **THE ROCKEFELLER FOUNDATION (**6/95-5/97)
Research towards improvement of rice carotenoid content. (RENEWAL)

$ 120,720 **NATIONAL INSTITUTES OF HEALTH-Minority** Biomedical Research Support at Lehman College (MBRS) (7/95-6/98)
(subproject) Molecular biology of carotenoid biosynthesis.
(undergraduate minority student support package)

$ 10,000 **CUNY** Collaborative Equipment Grant (1995-96)
Diatom molecular biology and biochemistry

$ 4,334 **PSC-CUNY** Research Award Program (7/95-12/96)
Immunolocalization of phytoene synthase in maize.

**1994**

$ 89,250 **THE ROCKEFELLER FOUNDATION** (6/94-5/95)
Research towards improvement of rice carotenoid content. (RENEWAL)

$ 40,600 **THE ROCKEFELLER FOUNDATION** (5/94-4/97)
Career Biotechnology Fellowship for Dr. Vivek Upasani, M.G. Science Institute, India, under the direction of Dr. Wurtzel,
A study of carotenoid biosynthesis in the rice endosperm.

$ 5,100 **PSC-CUNY** Research Award Program (7/94-6/95)
Characterization of maize phytoene synthase expression.

$ 167,158 **NATIONAL SCIENCE FOUNDATION** (9/1/94-8/31/96)
(subproject investigator; Dr. B. Meurer-Grimes, P.I.)
Acquisition of a liquid chromatography- mass spectrometry system at Lehman College.

$ 149,500 **NATIONAL INSTITUTES OF HEALTH** (9/30/94-6/30/95)
(subproject investigator; Dr. M. Philipp, PI.)
Minority Biomedical Research Support at Lehman College
(matching funds for HPLC-mass spectrometry system)
(funded, but not accepted because of duplicate NSF grant)

**1993**

$ 232,000 **CUNY-HEAT** PROGRAM (1993-1996) (Center for Biomedicine and Biotechnology)
Research equipment

$ 57,750 **THE ROCKEFELLER FOUNDATION** (6/93-5/94)
Research towards improvement of rice carotenoid content. (RENEWAL)

$ 4,258 **PSC-CUNY** Research Award Program (7/93-12/94)
Characterization of a maize phytoene desaturase.

$ 25,000 **CIBA-GEIGY** (1993) award, made to fund Molecular Biology Facility renovation

$ 52,761 **CUNY-HEAT** SUPPORT FUNDS (1993-1998) (Center for Biomedicine and Biotechnology) Supplies and Personnel

$ 200,204 **NATIONAL SCIENCE FOUNDATION**- Academic Infrastructure Program (4/93-9/95) (subproject investigator; PI- Dr. T. Jensen),
Renovation of cell and molecular and biochemistry laboratories.

$ 199,741 **CUNY-GRI** PROGRAM (1993-1994) (coinvestigator with Dr. D. Basile)
Plant Biology Equipment.

**1992**

$ 33,600 **THE ROCKEFELLER FOUNDATION** (6/92-6/93)
Research towards improvement of rice carotenoid content.

$ 2,850 **BLACK ROCK FOREST CONSORTIUM** (1992)
Genetics of maize carotenoid biosynthesis.
(support for summer maize field station)

$ 760 **Lehman College Shuster Award** (1992)
Molecular genetics of maize carotenoid biosynthesis.

**1991**

$ 233,714 **NATIONAL INSTITUTES OF HEALTH**- Minority Biomedical Research Support at Lehman College (MBRS) (7/91-6/95)
(subproject) Molecular biology of carotenoid biosynthesis.

(undergraduate minority student support package)

$ 3,500 **PSC-CUNY** Research Award Program (7/91-12/92, RF#662172)
Molecular biological approaches to plant systematics.

$ 2,250 **BLACK ROCK FOREST CONSORTIUM** (1991)
Genetics of maize carotenoid biosynthesis.

**1990**

$ 4,580 **BLACK ROCK FOREST CONSORTIUM** (1990)
Genetics of maize carotenoid biosynthesis.

$ 34,000 **NATIONAL INSTITUTES OF HEALTH** (1990)
(for renovation of Molecular Biology Facility)

**1989**

$ 105,000 **McKNIGHT FOUNDATION** (7/89-7/92)
**(only 10 grants awarded per 3-year period)**
Gene regulation in higher plant carotenoid biosynthesis

$ 160,000 **AMERICAN CANCER SOCIETY** (1/89-1/92, RF#776010)
Gene expression in carotenoid biosynthesis.

$ 14,996 **PSC-CUNY** Research Award Program (7/89-12/91, RF#669158- $8000,
RF#661139-$6996)
Gene expression in maize carotenoid biosynthesis.

$ 25,000 **CIBA-GEIGY** (1989) award, made to fund Molecular Biology Facility renovation.

$ 47,000 Lehman contribution for renovation of the molecular biology facility (1989)

**1988**

$ 282,990 **NATIONAL SCIENCE FOUNDATION** (9/88-9/92)
Research Improvement in Minority Institutions (RIMI)
(E. Wurtzel, Project director, #RII-8805140)
Molecular biology facility for studies on regulation, structure, and function of biological macromolecules.

$ 152,451 **NATIONAL INSTITUTES OF HEALTH** (7/88-6/91)
Minority Biomedical Research Support at Lehman College (MBRS)
(subproject RF #442436) Regular investigator on subproject:
Cloning and expression of carotenoid biosynthetic genes.

$ 1,700 **Lehman College Shuster Award** (1988)
Transposon tagging of maize genes.

$ 2,500 **Women's Research and Development Fund**, City University of New York, (1988)
Cloning of carotenoid biosynthetic genes.

**1987**

$ 11,000 **PSC-CUNY** Research Award Program (7/87-7/89, RF#667153-$6000,
RF#668140-$5000)
Transposon tagging of maize and tomato carotenoid biosynthetic genes.

$ 12,930 **NIH-Minority Biomedical Research Support at Lehman College**
(2/87-6/88, subproject RF#442223)
Cloning and expression of carotenoid biosynthetic genes.

$ 1,600 **Lehman College Shuster Award** (1987)
Transposon tagging of maize genes.

**1983**

$ 52,800 **NATIONAL SCIENCE FOUNDATION** (1983-1985) (#PCM83-12558)
Postdoctoral Fellowship in Plant Molecular Biology (**only 24 awarded per year**)
Regulation of gene expression in maize from a distal, cis-acting region of DNA.

**OTHER SERVICE:**

Department of Biological Sciences

Chair, Department of Biological Sciences (2022-2025)
Curriculum committee, Department of Biological Sciences (9/88- 6/2001)
Graduate Studies Committee, Department of Biological Sciences (2007-2013)
Greenhouse committee, Department of Biological Sciences (9/88- present)
Personnel and Budget committee, Department of Biological Sciences (1999-2003, 2004-10; 2022-2025)
Departmental Library representative (1993-2001)
Library Committee, Department of Biological Sciences (2001-2007)
Director- Lehman College Molecular Biology Facility
Organizer of weekly Biological Sciences visiting lecture series (2/88-2/90)
Member, various faculty search committees (ongoing)
Chair, Biosciences Faculty Search Committee (Lehman College: Plant Biology-Signaling & Regulation) (2002-2003)
Chair, Greenhouse CLT Search Committee (2009-2010)

Lehman College

Member, Tenure, Promotion, & Certificate of Continuous Employment [TPCCE] Committee (2024-2025)
Member, Faculty P&B [FP&B] Committee (2022-2025)
Institutional Biohazards Committee, Lehman College (11/88-present)
Institutional Radiation Safety Committee (1996- 2001)
Master Plan Committee to consider Lehman as a residential college (1996-97)
Bioinformatics Committee (2001-2002)
Faculty Development Committee (2001-2002)
Research and Scholarship Advisory Committee (Lehman College), 2004
Interdepartmental committee to develop a certificate program in scientific illustration (2002)
Faculty Consultant Group- 5-year Information Technology Budget Request (2002)
Senate subcommittee on the library (1995-97)
Senate subcommittee on the budget (1989-1994)
Annual Science Lecture committee, Lehman College (1989 lecturer, Stephen Jay Gould)
Sigma Xi, Lehman College chapter (treasurer) 1992-94; (President Elect 1995-96); President (1996-1997)
MBRS-MARC Advisory Committee (1995-96; 1996-1997)
Undergraduate recruitment: providing lab tours/speaking to visiting high school students; speaking at Conference (5/2000 Lehman College), "Promoting Science Research for all Bronx High Schools."
Member, Search Committee for the Dean of Natural and Social Sciences, Lehman College (2002-2003)

CUNY

CUNY ASRC Macromolecular Crystallization Facility oversight committee member (6/2020-present)
CUNY Plant Sciences Ph.D. program advisory committee (1988-95; 1996-9; 2000-3; 2004-7); Chair (2000-3; 2004-2010, except Fall 2009).
CUNY Biology Ph.D. program Executive Committee (2000-2003; 2004-2007; 2007-2010)
Member, New York State Center for Advanced Technology (CAT) at CUNY (2007-present) http://www.cunyphotonics.com/
Member, Institute of Macromolecular Assemblies (2010-present) http://www.sci.ccny.cuny.edu/mma/index.php
Member, CUNY Institute for Biomolecular Structure and Function (1996- present)
Member, CUNY Center for Applied Biomedicine and Biotechnology (1993- present)
CUNY Task Force on Restructuring Doctoral Education in the Laboratory Sciences (2006-2007)
CUNY Graduate Council Representative (2004-2006)
CUNY faculty advisory committee for CUNY Advanced Science Research Center (2004-2006)
Organizer, 1998 CUNY Faculty Development Program: Seminar series on "Linking research in natural products, plant biochemistry, and biotechnology."
Committee member on numerous CUNY doctoral dissertation committees

CUNY faculty interview committee- hiring CUNY Director of Technology Transfer (1999)
CUNY faculty committee- interviewed by external evaluators of CUNY Research Foundation (1999)
Faculty Consultant Committee for development of new CUNY WEB portal (2002)
WEB site creation: CUNY Plant Sciences PhD subprogram http://a32.lehman.cuny.edu/PlantPhD

Other

Bringing science to PreK children in the classroom (2024)
English Board Member (1997-1999) of local elementary/ middle school.
Science Fair Judge (2003) local middle school (grades 6-8).
Contributor to Plant Metabolic Network (PMN) online database (2010)
http://plantcyc.org/about/contributors.faces

## OTHER SERVICE TO THE PROFESSION

### *Activities for enhancing diversity of the scientific workforce*

*Underrepresented scientists' mentor:* National Institutes of Health MBRS program (1987-1999); National Institutes of Health MARC program (1996-1997; 1998); National Science Foundation-AMPS program (2003-4); National Science Foundation-Magnet Fellow (2005); Project Seed, American Chemical Society (1990); Harlem Children's Society (2005).

*Member, Minority Affairs Committee*, ASPB (American Society of Plant Biologists) (2004-10); Vice Chair 2006-7: Creator of ASPB "Diversity Bank" network

*Faculty member at a HSI/MI* (Hispanic-serving/Minority) Institution (1987- present).

### *Activities on Gender Balance*

Member, **Gordon Research Conferences** (GRC) Power Hour Advisory committee, which advises on the best ideas and practices for addressing the challenges women continue to face in science and engineering. Power Hour workshops are one-hour sessions held at GRC conferences and are open to all participants (Jan. 2019-present).

Member, **American Society of Plant Biology**- Women in Plant Biology Committee (Oct 1, 2013-Sept. 30, 2016)

Organizer, **Power Hour**, on Facing Career Challenges and Professional Development for Women, **Gordon Research Conference on Carotenoids**, Lucca, Tuscany, Italy, 5/23/2016 (Co-organizer L. Quadro, Rutgers Univ., NJ).

Organizer, **Power Hour**, on Facing Career Challenges and Professional Development for Women, **Gordon Research Conference on Plant Metabolic Engineering**, Waterville Valley, NH, 7/10/2017

## PROFESSIONAL SOCIETIES

AAAS, The American Association for the Advancement of Science; The International Carotenoid Society;
ASBMB, American Society of Biochemistry and Molecular Biology; American Society of Plant Biology (ASPB); American Phytochemical Society; Sigma Xi, The Scientific Research Society

## RESEARCH TRAINEES (1987-2024)

**Visiting Scientists**

1. Dr. Marcia Brody (on sabbatical from Hunter College; also continued research project bringing with her postdocs and students from Hunter College)
2. Dr. Toshiko Yamaguchi (Hunter College)
3. Dr. Jane Gallagher (City College)
4. Dr. Irene Katz (New York) Winter 1994
5. Dr. Song de Xiu (China Academy Sciences, Beijing)
6. Professor Nelson Cai (China)
7. Professor Luciano Gaudio (University of Naples)
8. Dr. Vivek Upasani (M.G. Science Institute, India) (Biotechnology Career Fellow, Rockefeller Foundation (yearly three-month visits: 1994, 1995, 1996, 1998)
9. Dr. Miguel Cervantes-Cervantes, Hostos Community College, CUNY (Summer 1997-2003) (current: Rutgers)
10. Dr. Renata Rivera-Madrid, Centro De Invetigacion Cientifica De Yucatan, Mérida, Mexico (July-October 1998, sabbatical with fellowship from Mexican Academy of Science)
11. Maximo Rodriguez, visiting Ph.D. student from Dr. Douglas Busch's laboratory, U. California/ Rutgers University (1998-1999)
12. Dr. Cynthia Gallagher (PhD Chemistry) (Summer 2000- Winter 2004.) (current: Pfizer patents)

13-14. Graduate students from Tom Brutnell lab, Cornell/BTI to learn HPLC (Ling Bai, Lisa Conrad)

15. Dr. Gulhan Ercan, (PhD Plant Biotechnology) Akdeniz University, Turkey (April-Aug. 2001)
16. Dr. Changfu Zhu (PhD Plant Biology), most recently from Frankfurt University (2/03-10/04). (career: U. Lleida, Spain; current: deceased)
17. Dr. Paul Matthews (Ph.D. Molecular Biology, CUNY), S.S. Steiner, Washington State (April 2004; 2005; 2006)
18. Dr. Tahhan Jaradat, (Ph.D. Plant Molecular Biology), Texas Tech University (Sept 11, 2004-Mar 31, 2006) (current: BCC, CUNY)
19. Dr. Chris Gehring, (Ph.D. Biochemistry), University of the Western Cape, South Africa (Professor of Plant Biotechnology, sabbatical: Aug 2007-Jan 2008) (current: KAUST, Saudi Arabia)
20. Dr. Abby Cuttriss, Australian National University, Canberra, Australia (Dec 2007- July 2011) (current: Asst. Prof., U Hawai'i)
21. Dr. Louis Bradbury, Centre for Plant Conservation Genetics, Southern Cross Univ., Australia (Dec 2007-Dec 2011) (current: faculty at York College, CUNY)
22. Dr. Maria Shumskaya, Biochemistry and Biophysics, Stockholm University (1/08- 2013) (current: Lecturer at Lehman College, CUNY)
23. Dr. Faqiang (Justin) Li, Ph.D. Biochemistry, CUNY Biochemistry Ph.D. Program (6/08 –12/08) (career: postdoc, Vierstra lab, U. Wisconsin; as of 2015: South China Agricultural University, Guangzhou, China)
24. Dr. Stuart Meier, postdoc, University of the Western Cape, South Africa (Nov 2008) (curr: KAUST, Saudi Arabia)
25. Dr. Yu Chen, Institute of Genetics and Developmental Biology, Chinese Academy of Sciences (1/09-8/09) (current: Syngenta, China).
26. Dr. Yaakov Tadmor, Neve Yaar Research Center, Agricultural Research organization, Israel (sabbatical, Aug. 2010-July 2011)
27. Dr. Charles Ampomah-Dwamena, Fruit Genomics, Plant & Food Research, New Zealand (sabbatical, March-June 2011)
28. Dr. Regina Monaco, postdoc, Ph.D. Chemistry, (Oct. 2010- 2012)
29. Kaijie Zhu, Ph.D. student, College of Horticulture & Forestry Science, Huazhong Agricultural University, Wuhan, China (2019-2020)

**Undergraduates (>32)***
Frank Ross
Christina Murillo
Nick Licciardello
Carla Cota
Wednaud Ronelus
Ivelise Rovira
Phyllis Edwards
Jacqueline Vernon
Josephina Hinojosa
Moji Arowosegbe
Daniel Mozoub
Jerry Pekarski
Roseanna Carter
Elke Harris
Karen Galindo (Hunter College)
Anthony Scherbina
Albert Akkerman
Binh Nguyen
Angella Smith
Timothy Adeleye
Gregorio Valdez
Dayana Matias
Kathy Bae
Mohammad Aslani
Hoda Aslani
Cecelia Marquis
Tom Goldman
Phyllis Williams
Elizabeth Botero
Afroza Hossain
Kalisha Wilson
Lenora Gocak

**not included were many volunteers and work-study students who assisted in the lab;
For over 20 years, at least 5-8 students come to the lab every summer and during the year
to work as lab assistants and in the maize genetics field.

**Funding for undergraduate research:**
NIH- Minority Access to Research Careers Program (**MARC**)[1]
El Puente **Bridges to the Baccalaureate program** (between Lehman College and Hostos Community College, CUNY)[2]
CUNY **AMP Program** (Hostos Community College)[3]
National Institutes of Health- Minority Biomedical Research Support Program (**MBRS**)[4]

Funded undergraduate students:
Angella Smith[1], Ivelise Rovira [1]
Jerry Pekarski[2]
Roseanna Carter [3]
Phyllis Edwards[4], Jacqueline Vernon[4], Cecelia Marquis[4], Thomas Goldman[4], Josephina Hinojosa[4], Moji Arowosegbe[4], Daniel Mozoub[4], Dayana Matias[4], Gregorio Valdez[4] , Wednaud Ronelus[4], Timothy Adeleye[4], Carla Cota[4]

**Masters students (16)**
Ingrid Grand
Paolo Caputo
Elgilda Musi
Ruibai Luo
Victor Flores
Danielle Preston
Hong Du
Paolo Caputo (Fulbright scholar from Italy)
Jianping Cong (Hunter College)
Ingrid Grand
Geoffrey Schaffner
Maudi Rodriguez
Swarnamala Ratnayaka
Yingzhen Yang
Zhaolan Zhou

**PhD students (18)**
Joseph Stabile
Zhaohui Li
Arulmolee Yoganathan
Jia Yu
Ruibai Luo
Paul D. Matthews
Faqiang Li
Ratnakar Vallabhaneni
Oren Tzfadia
Rena Quinlan
Jesús Alonso Beltrán Zambrano
Kaiji Zhu
Royce Cumming
Jiafeng Geng
Anuja Modi
C Ma (Kennelly)
Rasika Mudalige
Xiaoling Yao

**Projects of graduated Masters students**

2012: Correy Jones (Fall 2012): Metabolic engineering of □-carotene accumulation in *E. coli*.

2004: Ingrid Grand (April 2003- Aug. 2004); NSF-AMPS funded (2003-4): Isolation of maize lycopene epsilon cyclase gene fragment.

1992: Paolo Caputo: Molecular systematics of the Cycadales. (**current:** Professor, U. Naples/Director, Naples Botanical Garden)

1997: Elgilda Musi: Research on cloning DNA encoding rice ATP synthase.

1998: Ruibai Luo: Cloning and characterization of cDNAs encoding zetacarotene desaturases from maize and rice. (**current:** Program Director, NIH/NCI)

2020-24:Victor Flores (Katharhy G) [MA, Department of Biological Sciences, Lehman College]. "Molecular mechanisms controlling activity of the carotenoid biosynthetic enzyme, Z-ISO". (**current:** PhD student, Arizona State University)

6/21- 9/23: Danielle Preston (MA Biological Sciences, 12/23: Analysis of carotenoid pigments in camouflaging insects and their plant diets. (**current:** PepsiCo Research & Development, 2/2024 – Present)

**PhD Student Theses**

1994 Stabile, Joseph- Thesis: "Molecular evolution in natural populations of *Skeletonema costatum*: Restriction mapping and analysis of the chloroplast genome." (Dr. Jane Gallagher, City College, co-mentor) [Biology Ph.D. program, Graduate School and University Center, CUNY] (**current:** Professor, Biology Dept., Iona College, NY)

1998 Li, Zhaohui- Thesis: "Molecular cloning and characterization of phytoene desaturase cDNA and leucine-rich repeat protein kinase cDNA from maize." [Biochemistry Ph.D. program, Graduate School and University Center, CUNY] (**current:** Programming Engineer, Hertz Co., NJ)

1998 Yoganathan, Arulmolee- Thesis: "Isolation, expression and functional analysis of a cDNA encoding phytoene desaturase, a carotenoid biosynthetic enzyme from rice, *Oryza sativa* L." [Biology Ph.D. program, Graduate School and University Center, CUNY]

1999 Yu, Jia- Thesis: "The differential expression of carotenoid biosynthetic enzymes in the endosperms of *Zea mays* and *Oryza sativa*." [Biochemistry Ph. D. Program, Graduate School and University Center, CUNY]. (**current:** Instructor in Department of Medicine, Pulmonary and Critical Care Division, Brigham and Women's Hospital/Harvard Medical School as of 12/08- Molecular basis underlying the role of estrogen in promoting the pulmonary metastasis of tuberin-deficient cells)

2000 Luo, Ruibai- Thesis: "Molecular and genetic studies related to zeta-carotene desaturation and carotenoid biosynthesis in maize and rice." [Biology Ph.D. program, Graduate School and University Center, CUNY] (**current:** Program Director, NIH/NCI)

2001 Matthews, Paul D.- Thesis: "Carotenogenesis in maize and rice." [Biology Ph.D. program, Graduate School and University Center, CUNY] (**current: (retired)** Research Scientist, SS Steiner, Yakima, WA- hops biotechnology and phytoestrogens)

2008 Li, Faqiang- Thesis: "Carotenoid Biosynthesis in Maize: Characterization of the *PSY* Gene Family and Genetic Definition of a New Biosynthetic Step in Higher Plants" [Biochemistry Ph. D. Program, Graduate School and University Center, CUNY]. (**current:** Postdoc with Richard Vierstra, U. Wisconsin, as of 1/09; faculty member at South China Agricultural University, Guangzhou, China, as of 9/2015)

2009 Vallabhaneni, Ratnakar- Thesis: "Carotenogenesis in Maize Endosperm: Natural Genetic Variation as a Tool for Predictive Metabolic Engineering" [Biology Ph.D. program, Graduate School and University Center, CUNY]]. (**current:** Head of Molecular Biology-Molecular Breeding, Nuziveedu Seeds Pvt. Ltd., India (http://www.nslgroup.co.in), as of Dec 2011)

2011 Tzfadia, Oren- Thesis: "Systems biology-based study of provitamin A carotenoid biosynthesis in *Arabidopsis thaliana*" [Biology Ph.D. program, Graduate School and University Center, CUNY]. (**current:** Post-Doctoral fellow, Weizmann Institute of Science, Department of Plant Sciences as of Sept. 2011)

2012 Quinlan, Rena- Thesis: "Characterization of the CYP97 and HYD Carotene Hydroxylase Enzymes" [Biology Ph.D. program, Graduate School and University Center, CUNY]. (**current:** Lecturer, Dept. of Biological Sciences, Lehman College, CUNY)

2014 Jesús Alonso Beltrán Zambrano "Functional characterization of the plant 15-*cis*-zeta-carotene isomerase (Z-ISO)" [Biology Ph.D. program, Graduate School and University Center, CUNY]. (**current:** (as of Jan. 2024) Assistant Professor of Synthetic Biology, University of Delaware)

**Current Students:**
(2020- present) Royce Cumming [Biology Ph.D. program/EEB subprogram, Graduate School and University Center, CUNY and AMNH]. "Carotenoids in the stick insects."

## COURSES TAUGHT

General Biology/Biochemistry, SUNY at Stony Brook, Teaching Assistant (1976, 1977)
Genetics, SUNY at Stony Brook, Teaching Assistant (1977, 1978)
Molecular Biology and Biochemistry: Eukaryotic Genetics, Brookhaven National Lab, Lecturer (1984)
Molecular Biology, Lecture/lab/ undergrad level, Lehman College
Molecular Biology, Lecture/lab/ Masters level, Lehman College
Plant Molecular Biology, Lecture/lab/ Doctoral level, Lehman College/CUNY Grad Center
Principles of Biology, Lecture and lab/undergrad level, Lehman College
Plant Gene Expression, seminar on chloroplast biogenesis/Doctoral Level, Lehman /CUNY Grad Center
Plant Transposable Elements, seminar /Doctoral Level, Lehman College/CUNY Grad Center
Grantsmanship and Scientific Writing, Masters and Doctoral Level, Lehman College/CUNY Grad Center (*course developer:* E. Wurtzel)
Research Manuscript Writing, Masters and Doctoral level, Lehman College/CUNY Grad Center (*course developer*: E. Wurtzel)

**Development of innovative courses:** At CUNY, I have developed several courses in scientific writing. I draw on my own experience as a grant writer, reviewer and journal editor to help students learn how to write strong research proposals and scientific research manuscripts in courses that are student-based, feature career-related discussions, and utilize real-time interactive videoconferencing (which began long before the pandemic).

## COURSE: GRANTSMANSHIP AND DEVELOPING A RESEARCH PROPOSAL

I developed a grant-writing course which I have been teaching by zoom (or similar platforms) for many years. PhD students enroll through the CUNY Graduate Center from multiple programs, including Biochemistry; Biology- Molecular, Cellular & Developmental Biology (MCD) subprogram; Biology-Plant Sciences (PS) subprogram; Biology-Neuroscience (NS) subprogram; Biology-Ecology, Evolutionary Biology & Behavior (EEB) subprogram; and Chemistry PhD program. In addition to the PhD students from the multiple PhD programs, the course includes a few Masters students who enroll through Lehman College. **See** "Spring 2023" sample *at right*.

**GRANTSMANSHIP AND DEVELOPING A RESEARCH PROPOSAL**
[BIOL 79303; 3 hrs/ 3 credits]

Writing is an essential part of doing science, whether developing a thesis research proposal or applying for grant funding. Research begins with identifying testable hypotheses and defining specific aims that can be accomplished within a given time frame and with available resources. Competitive writing involves writing for the reader and creating a compelling research proposal.

**Learning Objectives:** This course will take on the format of an interactive workshop to introduce students to the art of research proposal development, grant writing, and grant proposal review. The course will provide useful techniques for developing hypothesis-driven grant proposals for submission to funding sources or to develop a hypothesis-driven thesis proposal, doctoral second level exam proposal or essay for the First Level Doctoral exam.

**Learning Goals:**
1. To develop a hypothesis driven research proposal.
2. To develop familiarity with the writing and review process associated with research grant proposals.
3. To become familiar with sources of research funding.

**Instructor:** Dr. Eleanore Wurtzel (*wurtzel@lehman.cuny.edu*).
Dr. Wurtzel has been awarded more than $7 million in research funding and she has served on numerous grant review panels for federal and private agencies. Dr. Wurtzel has been recognized by the American Association for the Advancement of Science, American Society of Plant Biologists, and International Carotenoid Society. She has also served on the Board of Trustees for the Gordon Research Conferences providing scientific advice in the fields of Biology and Chemistry. Dr. Wurtzel's research has been published in many high impact journals and her laboratory has produced several patents. Dr. Wurtzel is also Monitoring Editor for a top scientific journal. Dr. Wurtzel has contributed articles for high impact journals such as Science and Nature Plants. For further details, see: *http://wurtzel.lehman.cuny.edu/wurtzel/.*

**Class meeting time:** Wednesdays 9 AM-11:40 AM
This course will be held using ZOOM distance technology. *PhD students* should register for the BIOL 79303 class at the Graduate Center; *Masters students can register for BIO79305 at Lehman College*.