Letter from the President

One of the things I love about the Danforth Center is how it changes year after year. Despite the fact that our mission – to improve the human condition through plant science – remains constant, our people, our facilities, and our modes of working are constantly morphing and improving.

In 2022, we welcomed new graduate students, postdoctoral scientists, undergraduate researchers, and members of support teams across the Center, raising our community size to over 400 individuals. We welcomed Armando Bravo as a new Assistant Member and Principal Investigator. Armando has initiated an interesting program to understand how beneficial microbes within plants function and evolve.

We established a new 140-acre Danforth Center Field Research Site in St. Charles County. This is already providing a unique resource to extend research out of the lab and into a flexible field setting. We also started seeing results and positive outcomes from recent strategic initiatives, like the SINC Center to reduce greenhouse gas emissions in agriculture, and the Danforth Center Start-Up Initiative.

The Danforth Center is a dynamic, ever-evolving place. And I thank all of our community members and supporters who enable and drive such positive change!

Letter from the Chair

Sustainability can seem like an overused word these days, but sustainability is at the core of everything the Donald Danforth Plant Science Center was established to do:

- Feed the world, but with crops demanded by farmers and with in-country capacity-building, so that our scientific colleagues in Africa and Asia can perpetuate the system.
- Protect the planet—not by giving up existing systems, but by modifying them with resilient crops and crops that can help mitigate climate change while also feeding the world.
- Enhance the region. By planting our flag as the world center for plant science research, more companies and talent will grow here.

In just one year, we are witnessing big leaps forward in our mission to feed the world and heal the planet: improved cowpea approved in Ghana, the first-ever harvest of enriched rice in the Philippines, the identification of key microbes that contribute to drought-tolerance, and new strides in bioenergy research. Our innovation ecosystem is growing too: the Danforth Center’s new Start-Up Initiative is already bearing fruit, and the new field site is a major gamechanger for the pace of research.

All of this progress is made possible thanks to the support and interest of our community. Thank you.
Our People

Principal Investigators

Our principal investigators lead cutting-edge research in plant biology and genetics to create solutions for food security and environmental challenges. In 2022, the Danforth Center welcomed Armando Bravo, PhD from Boyce Thompson Institute in Ithaca, NY.

Tessa Burch-Smith, PhD
Associate Member
The Burch-Smith lab studies communication between plant cells and between plants and viruses to improve crop yield and resistance to infection.

Kristine Callis-Duehl, PhD
Executive Director of Education Research & Outreach
The Education Research & Outreach lab studies how to effectively engage students in authentic STEM research at all grade levels, K-16, in formal, informal, and virtual learning environments in an effort to recruit, train, and retain the next generation of diverse STEM and agtech scientists and leaders in St. Louis and around the world.

James Carrington, PhD
President and CEO
The Carrington lab focuses on how plants respond to viruses, mechanisms of epigenetics, and how crops can be improved to increase productivity.

Kirk Crymmer, PhD
Director, Advanced Biomass Laboratory
The Crymmer lab uses advanced imaging approaches to understand the inner workings of plants, microbes, and their interactions with each other and the environment.

Bradley Evans, PhD*
Director, Prognostics and Most Sovereignty
The Evans lab uses high-performance spectrometry, proteomics, and metabolomics for connecting molecular phenotypes with the macroscopic form and function of organisms.

Andrea Eyeland, PhD
Associate Member
The Eyeland lab uses experimental and computational approaches to investigate the regulation of architecture traits and yield potential in cereal crops.

Noah Fahlgren, PhD
Director, joint Science faculty
The Data Science team is a computing and data analytics hub that develops and deploys technologies in computational biology, computer science, and mathematics, and statistics to accelerate discoveries from data and models in plant science.

Malia Gehrman, PhD
Assistant Member
The Gehrman lab develops high-throughput phenotyping approaches to study mechanisms of crop resilience under temperature stress.

Elizabeth Kellogg, PhD
Member, Robert E. King Distinguished Investigator
The Kellogg lab studies genomes, growth, and development of sorghum, maize, and their wild relatives, using biodiversity research to make ecosystems and agriculture more sustainable.

Toni Kitchman, PhD
Member, Oliver M. Langenberg Distinguished Investigator, JPL Research
The Kitchman lab studies the production of the ant cancer compound cyclopamine in corn, modification of plant medicines by the soil microbiome, and the oilseed crop camelina as a source of renewable fuel.

Mao Li, PhD
Member, Senior Research Scientist and Principal Investigator
The Li lab develops mathematical methods, models, and computational tools to extract and analyze comprehensive plant morphological features from 2D and 3D imaging data to fully utilize new technologies and accelerate biological discoveries.

Donald Mackenzie, PhD
Executive Director, Institute for International Crops Improvement (ICIC)
The ICIC is committed to delivering precision genetics technologies to meet the most significant food and nutritional security challenges faced by smallholder farmers everywhere.

Blake Meyers, PhD
Member and Professor, Division of Plant Science and Technology, Department of Missouri – Columbia
The Meyers lab uses advanced imaging approaches for plant genetic and computational approaches to study the effects of phenotype, genotype, and the environment on crop productivity and resiliency.

Allison Miller, PhD
Member and Professor of Biology, Saint Louis University
The Miller lab explores how long-lived plants respond to dynamic environments, with the goal of developing perennial crops that support ecologically sustainable agricultural and agricultural systems.

Todd Mockler, PhD**
Member, Geraldine and Robert Virgil Distinguished Investigator
The Mockler lab uses genomics, high-resolution phenotyping, and computational approaches to understand plant responses to biotic and abiotic stress to improve productivity in food and energy crops.

Dmitri Nusinow, PhD
Assistant Member
The Nusinow lab focuses on increasing plant productivity by delivering daily and seasonal responses to the environment.

Sona Pandey, PhD
Member and E. Desmond Lee Faculty
The Pandey lab uses molecular, biochemical, and functional studies to understand the mechanisms of stress tolerance and yield improvement in plants by heterotrophic G-proteins.

Dilip Shah, PhD
Associate Member
The Shah lab investigates modes of action of antifungal plant defenses and defense-like peptides to enable development of these peptides as bioinspired fungicidal and fungal disease resistant crops for yield protection.

Nadia Shakoor, PhD
Senior Research Scientist and Principal Investigator
The Shakoor lab develops and uses integrated digital agriculture systems to study the effects of genotype, phenotype, and the environment on crop productivity and resiliency.

R. Keith Stollkin, PhD
Member and Associate Professor, Division of Pharmacological Sciences, University of Missouri – Columbia
The Stollkin lab seeks to uncover how plants determine which regions of their genomes should be expressed, which regions should not be expressed, and to create new technologies in plant biology.

Nigel Taylor, PhD
Associate Member, Dorothy J. King Distinguished Investigator
The Taylor lab applies applied computational approaches to disease and pest resistance, to environmental stresses to improve productivity in food and energy crops.

Todd Mockler, PhD**
Member, Geraldine and Robert Virgil Distinguished Investigator
The Mockler lab uses genomics, high-resolution phenotyping, and computational approaches to understand plant responses to biotic and abiotic stress to improve productivity in food and energy crops.

Kwangchoon Park, PhD
Member, IEEE Fellow
The Park lab develops advanced imaging approaches to understand the inner workings of plants, microbes, and their interactions with each other and the environment.

Bing Yang, PhD
Member and Professor, Division of Plant Sciences, University of Missouri – Columbia
The Yang lab uses advanced computational and computational methods to increase the understanding of plant responses to environmental changes, including nitrogen/ phosphorous/water deficiencies; and regulation of lipid metabolism and vesicle trafficking.

Veena Vennila, PhD
Director, Plant Transformation Facility
The Vennila lab explores novel approaches for plant genetic engineering and genome modification technologies to enable plant biology research for crop improvement.

Xueming (Sam) Wang, PhD
Member and Operating Chair, Lee Professor, University of Missouri – St. Louis
The Wang lab focuses on lipid signaling in plant response to environmental changes, including nitrogen/ phosphorous/water deficiencies; and regulation of lipid metabolism and vesicle trafficking.

Our People

improve the human condition through plant science
Success Breeds Success

PBR Cowpea Approved in Ghana

With regulatory assistance from the Danforth Center Institute for International Crop Improvement, Ghana has approved pod-borer-resistant (PBR) cowpea for commercialization. If all goes well, seeds could be available to Ghanaian farmers in 2024. Cowpea is a crucial source of protein for more than 200 million people, but it is susceptible to the devastating pod borer insect which can destroy yields by up to 80%. The Danforth Center was previously instrumental in helping the improved variety find approval in Nigeria where it is now in farmers’ hands. PBR cowpea seed output in Nigeria increased nearly 60% in 2022 in response to farmer demand, and the team is focused on scaling in-country seed production capacity.

“Hunger is a complicated issue. It’s exacerbated by conflict. It’s exacerbated by climate change. But science gives us the tools to make a difference.”
-Don MacKenzie, PhD, Executive Director, IICI

Food as a Human Right

Feeding the world has never been more urgent. Climate change, soil degradation, water scarcity; plant science is critical to addressing these serious challenges. Danforth Center scientists are working to deliver new crop varieties that are more resilient, productive, and nutritious—to empower farmers and ensure food security for all.

In 2022, PBR cowpea was approved for commercialization in Ghana. With the help of the Danforth Center, it is already in farmers’ hands in Nigeria, where the focus is now on scaling seed supply to meet the huge demand.

Cowpea is the most important indigenous legume in West Africa both in terms of food security and income generation for smallholder farmers.

Cowpea farmers formerly had to spray pesticides up to 10 times per season, often with little protective gear. The new resistant variety promises better yields, less expense, and better health.
Rooting against Climate Change

Climate change jeopardizes the very foundation of our global food systems. Rising temperatures, shifting rainfall patterns, increased frequency of extreme weather events, and changing pest and disease dynamics all contribute to the mounting challenges faced by farmers worldwide. Researchers at the Danforth Center are working urgently to mitigate these risks and adapt food crops for the future.

Rice Reaches the Public

First Enriched Rice Harvest in Philippines

The year 2022 marked the first commercial harvest of enriched rice in the Philippines after the Danforth Center helped secure commercial propagation approval there the year prior. Malusog (or “healthy”) Rice is the name given to enriched rice that contains higher levels of beta-carotene, a precursor to vitamin A in the body. Vitamin A deficiency is a major health issue in many developing countries and can cause blindness or even death. Only 1 out of 5 Filipino households meets the requirement for vitamin A intake in their diet. Enriched rice has the potential to become an effective complementary intervention.

A First Step for Teff

Stature Successfully Shortened to Combat Lodging

More than 100 million people in Ethiopia rely on the ancient grain teff for sustenance and nutrition. It is naturally gluten-free, iron-rich, and contains high-quality protein, but despite its many advantages, teff is an orphan crop that has not benefited from advanced breeding. Teff farmers lose about 25% of yield because the unimproved plants grow too tall and fall over, a condition known as lodging. In 2022, researchers at the Danforth Center led by Dr. Getu Beyene Duguma deployed cutting-edge technology to create semidwarf teff that resists lodging—the first step toward an improved variety.

“Growing up on a farm in Ethiopia, I know first-hand that our success will bring immense benefits for farmers.”

-Getu Beyene Duguma, PhD
Senior Manager,
Regulatory Science
Unlocking the Secrets of Plant-Microbe Interactions

Pioneering Research for Sustainable Agriculture and Beyond

Beneath our feet lies a hidden world bustling with activity, where tiny organisms shape the destiny of plants and influence the health of our planet. The Danforth Center’s Subterranean Influences on Nitrogen and Carbon (SINC) Center investigates the complex interactions between plants and soil microorganisms with a goal of creating a more sustainable future for agriculture and beyond.

• In 2022, SINC Center Co-director Becky Bart, PhD, and a multidisciplinary team used a new data modeling strategy to identify key microbes that help plants tolerate drought and low nitrogen conditions. This discovery has the potential to improve crop resilience in the face of climate change. The researchers worked with sorghum and are now tackling corn.

• Fellow SINC co-director Chris Topp, PhD, has developed a groundbreaking new system to study and visualize root systems. Using large plant growth boxes called “mesocosms” equipped with sensors, Topp’s team can analyze complete, living root systems in 3D. By studying roots, the Topp lab aims to improve water and nutrient uptake and enhance carbon capture for a more sustainable agriculture.

The SINC Center was made possible with a founding gift from Phil and Sima Needleman and with support from Bank of America.
Leading Global Innovation

Danforth Center’s New Field Site and the Power of Partnership

The Danforth Center stands at the forefront of scientific innovation, supported by its cutting-edge infrastructure and state-of-the-art cores. These exceptional facilities serve as a launchpad for groundbreaking discoveries and transformative solutions to global agricultural challenges.

- In 2022, the Center added a new 140-acre Field Research Site to existing tools for researchers. Located in St. Charles County, this proprietary field site allows scientists closer proximity and more control over their existing field work—and the opportunity for longer term projects. With generous support from John and Anne McDonnell and Beau and Suzy Brauer.

- The Danforth Center joined seven other leading research institutions this year in founding the new Taylor Geospatial Institute with a goal of positioning the region as a geospatial science leader. Funding by Andrew C. Taylor.

- The Danforth Center has joined forces with Saint Louis University to deploy “edge computing” in order to more broadly share farm intelligence. Smart farm technology generates vast amounts of data. Researchers are collaborating to create a cyber-physical system to better speed and share information from the field. Funding by National Science Foundation.

From St. Louis to the World

The Danforth Center’s innovation ecosystem is intentional. By connecting scientists, innovators, industry leaders, and investors, the Center accelerates the translation of cutting-edge research into practical solutions for global challenges in agriculture, food security, and sustainability. And our work creates opportunities for people who live here in St. Louis. Together, we are paving the way for transformative, worldwide impact.

YOU ARE HELPING

These projects to preserve our planet are funded through governmental grants, corporate and foundation grants, and by donors like you. Thank you.
New Start-Up Initiative

Bridging the Gap from Lab to Market for Agtech Innovations

Building on the success of existing ventures like Benson Hill and RNAissance Ag, the Danforth Center has launched the Danforth Center Start-Up Initiative, aiming to accelerate the transformation of cutting-edge research into practical solutions through the formation of agtech companies. The initiative supports principal investigators by identifying marketable applications, securing intellectual property, funding proof-of-concept research, and providing entrepreneurial guidance. The subsidiary Danforth Technology Company facilitates funding to speed innovative start-ups at the intersection of agriculture and the environment.

Battling Bugs with Precision

RNAissance Ag, a Danforth Center Start-Up, Offers Sustainable Pest Management Solutions

Co-founded by Danforth Center Senior Research Scientist Bala Venkata, PhD, RNAissance Ag is revolutionizing pest management with its groundbreaking RNA interference (RNAi) technology. By developing highly specific and biodegradable sprayable biopesticides, the company addresses the urgent need for effective, affordable, and environmentally sustainable solutions to combat insect pests. RNAissance Ag's targeted approach, which preserves beneficial pollinators, offers hope in the face of evolving pest challenges exacerbated by climate change.

Seeding Success

Wells Fargo IN2 and Danforth Center Collaborate to Accelerate Promising Agtech Solutions

For four years, the Danforth Center and Wells Fargo Innovation Incubator (IN2) have joined forces to expedite the development of sustainable agtech solutions. The partnership pairs agtech start-ups with Danforth Center principal investigators, providing validation and support to drive their progress. The fourth agtech cohort focused on biological solutions to enhance global resilience of food systems. The four companies selected in 2022 were: Cytophage Technologies (bacteriophage tech), Edison Agrosciences (sunflower-based rubber), Peptyde Bio (natural biofungicide), and Robigo (targeted antimicrobials).
A Pipeline of Plant Science Students

REU is joined by New High School Pilot Program

The Research Experience for Undergraduates (REU), funded by the National Science Foundation, has been part of summer at the Danforth Center for 20 years. In 2022, more than 157 undergraduate students from around the country competed for 21 spots at the rigorous 11-week program. Students received hands-on research experience and mentoring, as well as exposure to industry and innovation ecosystems. The program was managed by Principal Investigators Sona Pandey, PhD, and Tessa Burch-Smith, PhD, with assistance from Judy Mitchell and Monica Alsup.

In 2022, REU was joined by a pilot program for high school students from across the St. Louis region. Nearly 20 students were hired in the first class of what is now called the Research Experience for High School (REHS).

The Research Experience for Undergraduates welcomed 21 students in 2022. It was joined by a new authentic research internship program for high school students.

Science Education for the Future

STEM education equips students with the knowledge and skills to tackle pressing global challenges—and provides long-term career and life opportunities. By sharing plants’ role in food security, climate change mitigation, and environmental sustainability, we empower future generations to develop innovative solutions, preserve biodiversity, and cultivate a healthier planet for all.

Empower Students

“Empower Students”

“The program helped me see the potential of a plant science degree. I hope to pursue a PhD in plant breeding.”

- 2022 REU Intern

Empower Students

“The program helped me see the potential of a plant science degree. I hope to pursue a PhD in plant breeding.”

- 2022 REU Intern

JJK FAN UNFURLS

The Jackie Joyner-Kersee Food Agriculture Nutrition Innovation Center (JJK FAN) held a ribbon-cutting April 2022. This unique collaboration between Danforth Center, JJK Foundation, the University of Illinois Urbana-Champaign (UIUC), and Lansdowne UP seeks to provide quality youth and community programs in STEAM+Ag, food production, nutrition, and physical activity in East St. Louis and beyond.

The Danforth Center is a key partner in curriculum development and program implementation.

“JJK FAN UNFURLS”

PROFESSIONAL DEVELOPMENT

The Danforth Center’s Education Research and Outreach lab holds professional development sessions for educators throughout the year. Each training provides an instructional deep dive for a specific Authentic Research Experience (ARE), such as Mutant Millets, Discovering Volvox, and Plants Fight Back. Teachers bring knowledge of cutting-edge research tools and techniques back with them to the classroom.

“PROFESSIONAL DEVELOPMENT”

STEM education equips students with the knowledge and skills to tackle pressing global challenges—and provides long-term career and life opportunities. By sharing plants’ role in food security, climate change mitigation, and environmental sustainability, we empower future generations to develop innovative solutions, preserve biodiversity, and cultivate a healthier planet for all.

Science Education for the Future

STEM education equips students with the knowledge and skills to tackle pressing global challenges—and provides long-term career and life opportunities. By sharing plants’ role in food security, climate change mitigation, and environmental sustainability, we empower future generations to develop innovative solutions, preserve biodiversity, and cultivate a healthier planet for all.
Achieving Excellence

Danforth Center Principal Investigator Blake Meyers, PhD, runs marathons, literal and figurative. Together with a great team, this determination led him to develop novel applications of the first generation of high-throughput DNA sequencing. It’s why his group continues to make groundbreaking discoveries (such as this year’s noncoding ex-RNAs). In 2022, Blake was elected to the National Academy of Sciences.

2022 By the Numbers

- **$18.2M** grants awarded
- **$412M** annual economic impact of the Danforth Center campus and Helix
- **405** Danforth Center community members
- **36** countries represented
- **411** Danforth Society members
- **36** graduate students
- **100,105** unique website visitors
- **31** principal investigators
- **11** issued patents
- **13** patents filed
- **100,000** unique website visitors
- **17** patents pending
- **13** disclosures filed
- **15** patents filed
- **132** publications (1,737 total since inception)
- **17** patents awarded
- **11** issued patents
- **13** patents filed
- **36** graduate students
- **100,105** unique website visitors
- **36** countries represented

The Platinum Seal of Transparency is awarded to fewer than 1% of the 1.8 million nonprofits profiled on Candid’s leading charity-rating website, GuideStar.org.

1Voted by employees in St. Louis Post-Dispatch Top Workplace 2022.
Friends Committee
The Danforth Center is grateful to the Friends Committee, which promotes the work of the Center and grows membership and financial support through annual giving.

2022 FRIENDS COMMITTEE
Tim Halls, Chair
Cicardi Bruce
Bruce Buckland
Harold R. Burroughs
Molly Cline, PhD
Joan Culver
Maebelle Danforth
Michael Davies
Ann Desloge
Steve Epner
Courtney Evans
Glenn Fischer
George Fonyo
Roberta (Robbye) Frank
Gary Halls
Phil Hellwege
Ruth Kim
Jim Klinger
Paul Kravitz
Gary Mindel
Rashmi Nair, PhD
Jay Nous, Jr.
David Rath
Tim Rodgers
John W. Rowe
Jared Spader
James R. von der Heydt
Matt S. Wolfe

“The Friends Committee works to engage the public and expand donor support. In 2022, we celebrated Danforth Society membership growth for the first time since the pandemic began. Welcome to our new members! And to everyone reading this: you are an essential part of the Danforth Center’s success. Thank you.”

- Tim Halls, Chair, Friends Committee

Conversations
Organized by the Friends Committee since 2003, Conversations are free public events that provide the opportunity to learn about the work of the Center and our partners. In 2022, the event was in person and livestreamed. View the recording on our blog at danforthcenter.org.

GOING FOR THE GOLD IN EAST ST. LOUIS  |  AUGUST 25

The leaders of three institutions came together at the Danforth Center’s Conversations event to discuss a new effort that will change the lives of young people in our region. That initiative is the Jackie Joyner-Kersee Food, Agriculture, and Nutrition Innovation. Located in East St. Louis, this new enterprise is dedicated to teaching young people about health, nutrition, agriculture, and STEM through engaging lessons that promote equitable opportunities. It is a partnership represented by Dr. Jim Carrington, president and CEO of the Danforth Center, Robert J. Jones, PhD, chancellor of the University of Illinois at Urbana-Champaign, and Jackie Joyner-Kersee, Olympic legend and founder of the Jackie Joyner-Kersee Foundation. More than 260 people attended the program in person with an additional audience watching via livestream. Sarah Fenske, executive editor of Euclid Media Group, moderated.

Media sponsorship by:

"Being partners with Danforth Center—they took a chance investing in us, coming across that river and investing in our young people."

- Jackie Joyner-Kersee, Olympian and Founder, Jackie Joyner-Kersee Foundation
Young Friends
The Danforth Center is grateful to the Young Friends, a group of professionals, 40 and under, who raise friends and funds to advance the mission of the Danforth Center.

2022 STEERING COMMITTEE
Davey Oetting, Jr., Chair
Matt Plummer, Vice Chair
Logan O’Connor, Chair Emeritus
Erica Agnew
Melanie Bernds Smith
David Culver, Jr.
Meghan Donovan
Jackie Hayes
Ben Hjelle
Michael Hollo, Jr.
Tom Hough
Erin Jones
Powell Kalish
Anna Krane
Zach Mandel
Ted Maritz
Katie Murphy
Harry Petrey
Mireya Rivas
Drew Roznowski
Andrew Rzonca
Kelcie Sachtleben
Peter Schankman
Dan Schindler, CPA
Justin Scholz
Scott Smithson, Jr.
John Wahl
Michael Williams

“The Young Friends group was excited to bring back our signature Party with the Plants event in 2022, now as the capstone to the Grow Challenge online week of giving. We had a great time—and surpassed our goal in support of STEM education at the Danforth Center.”

- Davey Oetting
Chair, Young Friends

Grow Challenge Party with the Plants
Established by the Young Friends in 2017, Party with the Plants is a cocktail party to raise funds for the Danforth Center Impact Fund. After a two-year pandemic hiatus, the Party returned in 2022 as part of the Grow Challenge week of giving.

PARTY WITH THE PLANTS | SEPTEMBER 23
An unforgettable night of drinks, magic, music, and mingling! Hosted by the Danforth Center Young Friends, Party with the Plants welcomed ticketed attendees to socialize in the beautiful Danforth Center building. The event was the culmination to a very successful Grow Challenge week of giving, which raised nearly $115,000 for Danforth Center STEM education and outreach.

Many thanks to our Young Friends Steering Committee members who successfully relaunched Party with the Plants in 2022.

Supporters
Grow Challenge Party with the Plants
Established by the Young Friends in 2017, Party with the Plants is a cocktail party to raise funds for the Danforth Center Impact Fund. After a two-year pandemic hiatus, the Party returned in 2022 as part of the Grow Challenge week of giving. The event was the culmination to a very successful Grow Challenge week of giving, which raised nearly $115,000 for Danforth Center STEM education and outreach.

Social media selfie. The Grow Challenge week of giving raised nearly $115,000 for Danforth Center STEM education and outreach.

Many thanks to our Young Friends Steering Committee members who successfully relaunched Party with the Plants in 2022.
The Danforth Center is grateful to the many generous individuals and companies who supported Grow Challenge and Party with the Plants in 2022.

2022 GROW CHALLENGE DONORS

Anonymous
Mel & Sue Baile
Mr. & Mrs. William J. Barnard
Senator & Mr. Christopher S. Bond
William R. Boyle
Cicard & Susan Bruce
Ann Case
Dr. & Mrs. William H. Danforth
Dr. Robert & Lorene Drewe
Elizabeth Early
Mr. & Mrs. David C. Farrell
George L. Fonyo
Harris J. Frank

2022 GROW CHALLENGE SPONSORS

Central Trust Company
Carrollton Bank
TechAccel
Bronze

Silver
BioBalance Health, LLC
CMA Global
Lewis & Clark Agrifood
Maritz
Polsinelli
Running Tide
TechAccel

Gold
BANK OF AMERICA
Daugherty Business Solutions
Hjelle Advisors

In-Kind
Color Art
Common Ground
Public Relations
Conference Technologies, Inc.
CoverCress, Inc.
Div Bomb Industries
Mandel Law Firm
RubinBrown

Platinum
Novus
MONETA

Silver
Alpha Brewing Company
Anheuser-Busch
Lohr Distributing
Mighty Cricket
Nothing Bundt Cakes
Pedego
rootberry
StilL 630
Switchgrass Spirits
Urban Chestnut
Brewing Company

2022 MEMBERS

Anonymous
Mel & Sue Baile
Mr. & Mrs. William J. Barnard
Senator & Mr. Christopher S. Bond
William R. Boyle
Cicard & Susan Bruce
Ann Case
Dr. & Mrs. William H. Danforth
Dr. Robert & Lorene Drewe
Elizabeth Early
Mr. & Mrs. David C. Farrell
George L. Fonyo
Harris J. Frank

2022 MEMBERS

Allen W. Gaebe
Mr. & Mrs. David P. Gast
Mrs. Charles Guggenheim
Dr. & Mrs. Ernest J. Jaworski
Karen Kalish
Janet M. & Newell S. Knight,
Dr. & Mrs. Wilfred R. Konneker
Mary & Oliver & Langenberg
William A. & Christine A.
Linnenbringer
The Mares Family Endowment
Marilyn Miles
Mr. & Mrs. Jefferson Miller

Legacy Advisory Council

The Danforth Center is grateful to these legal and financial planning experts who provide assistance with the promotion of planned gifts to the Center.

Kenneth J. Bower, Clayton Financial Group
Stephen B. Daiker, Harrison & Held, LLP
Matthew G. Perlow, Husch Blackwell LLP
Bud Strong, Husch Blackwell LLP

Philip & Sima Needleman
Jo Oertli
Mr. & Mrs. John W. Rowe
Carol & D.C. Rucker
Walter & Marie Schmitz
Sanford & Gloria Spitzer
Moir Stevens
Mr. & Mrs. Austin Tao
Alice H. Yosburgh
Ambassador & Mrs. George Walker, III
Mr. Blanton J. Whitmire
Mr. & Mrs. John J. Wolfe, Jr.
Aileen Schneider Zawada

“The knocking of my socks off, the comprehensiveness of what Bill Danforth created, I hope that others feel as inspired by his legacy as I do.”

- Dr. Phil Needleman
WHD Legacy Society member
Danforth Leadership Council

The Danforth Center is grateful to the Danforth Leadership Council, a group of prominent St. Louisians interested in the role of plant science in the future of the region.

2022 EXECUTIVE COMMITTEE
Christopher B. Danforth, Chair
Benjamin Ola Akande
Darryl Chatman
Natalie DiNicola
Chip Lerwick
Dennis M. Plummer
Michael Riney
Michael Scully
Nancy Ylvisaker

2022 MEMBERS
Jane E. Arnold
Robert Brandt
Beau Brauer
Jason Brauer
Johannes Burlin
J. Powell Carman
Li Cheng
Charles K. Cohn
Erin Fitzgerald
Steven M. Fox
Marc D. Goldstein
Ted A. Guhr, Jr.
Jason R. Hall
Craig Herron
A. Charles Hiemenz, IV
Richard C. Holton, Jr.
Qiaoni “Linda” Jing
David Lemkemeier
Jason Logsdon
Aditya Malhotra
Anna McKelvey
Brett Moorehouse
Ted Noel
James R. Nowicke
Jennifer O’Connor
Chuck Orban
William L. Polk, Jr.
Jack Scott
Jeremy Williams
Heather Wood
Amadou Yattassaye
Jackie Yoon

“The Danforth Leadership Council aims to build corporate support for the Danforth Center mission. This year we were pleased to welcome many new supporters while deepening existing relationships. We are grateful for this continuing partnership.”

- Chris Danforth
Danforth Leadership Executive Committee

AgTech NEXT

The Danforth Center has been curating and hosting agtech events since 2009 with presentations and panels from the industry’s most sought-after thought-leaders. AgTech NEXT was a successful online event in 2020 and 2021 and launched as a hybrid event in 2022.

REINVENTING A FOOD SYSTEM IN CRISIS | OCTOBER 11 – 13

AgTech NEXT 2022 convened around the topic of a food system in crisis. Noting that our regional and global food systems are subject to increasing strain from climate change, resource scarcity, and sociopolitical strife, presenters and panelists sought paths to forge a more resilient future for food. Topics included leveraging innovative technologies, developing a diverse talent force, and co-creating more equitable trade programs. There were three keynote speakers: Dr. Cynthia Rosenzweig, Dr. Vasit Sagan, and Julie Borlaug. The event was a success with 270 people attending in person and another 371 virtual participants.

Networking events and vendor displays provided in-person attendees with breaks to refresh and recharge between deep dives.

There were 270 people who attended AgTech NEXT in person with 371 virtual attendees. The event included three keynote addresses by national figures.
Corporate Partners
The Danforth Center is grateful to our corporate, industry, and organization partners for their generous support in 2022.

$100,000+
- Agrich Global Inc.
- American Soybean Association
- Benson Hill
- Bunge North America Foundation
- Clayco, Inc.
- Discovery Partners
- Genentech
- Greater St. Louis, Inc.
- Hjelle Advisors LLC
- ICL Specialty Products, Inc.
- Lewis & Clark AgriFood
- Novus International, Inc.
- Potinelli
- St. Louis Economic Development Partnership
- Thompson Coburn LLP
- Valant Group Companies

$50,000+
- Corteva Agriculture
- Edward Jones
- WELLS FARGO
- Bank of America

$25,000+
- Boeing
- Millipore Sigma
- COBANK
- Bryan Cave Leighton Paisner (UK) LLP
- Stupp Bros. Bridge & Iron Co.
- Foundation Tarleton Corporation
- TechAccel LLC
- Mary R. Wolff Real Estate Management Co.

$10,000+
- Agrich Global Inc.
- American Soybean Association
- Benson Hill
- Bunge North America Foundation
- Clayco, Inc.
- Discovery Partners
- Genentech
- Greater St. Louis, Inc.
- Hjelle Advisors LLC
- ICL Specialty Products, Inc.
- Lewis & Clark AgriFood
- Novus International, Inc.
- Potinelli
- St. Louis Economic Development Partnership
- Thompson Coburn LLP
- Valant Group Companies

$5,000+
- Aon
- BioSTL
- Christner Architects
- CoverCress Inc.
- CSC Leasing Company
- Daugherty Business Solutions

Supporters
Harrison Street
Husch Blackwell LLP
KWS Saat AG
McKee, Vorhees & Sease, PLC
Open Prairie Ventures Inc.

$1,000+
- Agrich Global Inc.
- American Soybean Association
- Benson Hill
- Bunge North America Foundation
- Clayco, Inc.
- Discovery Partners
- Genentech
- Greater St. Louis, Inc.
- Hjelle Advisors LLC
- ICL Specialty Products, Inc.
- Lewis & Clark AgriFood
- Novus International, Inc.
- Potinelli
- St. Louis Economic Development Partnership
- Thompson Coburn LLP
- Valant Group Companies

Tributes
The Danforth Center is grateful to donors who chose to honor or memorialize their friends, loved ones, and colleagues with a gift to the Center in 2022. To make a tribute, visit danforthcenter.org/donate.

In Honor of...
- Jane Bond
  Ms. Martha W. Bond
  Mrs. and Mrs. Larry Bozzay
- Teri and Jim Carrington
  Mrs. Carol R. Armstrong
- Katie Claggert
  Mr. & Mrs. Birch Mullins
- Joan and David Culver
  Dr. Gayle F. Jackson & Dr. Frederick Kraus
- Keith Duncan
  Mr. and Mrs. Timothy G. Morrison
- Glenn Fischer
  Mr. Jason Fischer
- Bonnie & Gary Halls
  Tim Halls
- Timothy Halls
  Dan & Sarah Wessel

In Memory of...
- Sally Higginbotham
  Ms. Elizabeth B. Higginbotham
- Keith Liddy
  Mrs. Carol A. Buck
- Blake Meyer
  Dudley & Borth McCarter
- Dr. Allison Miller
  Mary Ellen Miller
- Mr. and Mrs. Timothy G. Morrison
- Carol Shepley
  MO State Chapter of the PEO Sisterhood

Tributes
Robert S. Matthews, Sr.
Elizabeth and Michael Brunt
Dottie and Jeff Miller
Mrs. Gretchen H. Ross
Charles M.M. Shepherd
Susanne W. Shephard
Francis J. Stokes
Luke Kissam & Kathryn Schanen Kissam
Mike Taich
Dr. Alison Bedell
Peter Taylor
Ms. Nancy L. Carl
Jeanette R. Huey
Thomas E. Thompson
Anonymous
Francis and Estelle Walls
Melissa & Brock Lundak
Peg and Blanton Whitmire
Gary D. Curl & Carol Jones-Curl

Docents
The Danforth Center is grateful to our highly trained docents who led tours and increased public awareness of the Danforth Center in 2022.

Molly Cline, PhD
Joan Culver
Steve Epner
Martha Ferdinand
Glenn Fischer
Robert (Robbye) Frank
Gary Mindel
Rashmi Nair, PhD
Fred Perlak, PhD
Matthew Rubin, PhD
Rich Schumacher, PhD
Austin Tao
James von der Heydt

Longtime docent Rich Schumacher, PhD, leads a tour. Docents are highly trained and essential to introducing the public to the mission of the Center.
Selected Financial Data
Fiscal Year Ended December 31, 2022
(Unaudited)

UNRESTRICTED OPERATING REVENUES\(^1\)

<table>
<thead>
<tr>
<th>Revenue Source</th>
<th>Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Grants and Contracts</td>
<td>$20,847</td>
</tr>
<tr>
<td>Donor Support</td>
<td>$17,457</td>
</tr>
<tr>
<td>Annual Gifts</td>
<td>$2,248</td>
</tr>
<tr>
<td>Endowment Draw</td>
<td>$15,209</td>
</tr>
<tr>
<td>Core Facility Fees</td>
<td>$2,174</td>
</tr>
<tr>
<td>Other Income</td>
<td>$2,685</td>
</tr>
</tbody>
</table>

Total Operating Revenues: $43,163 (100%)

OPERATING EXPENSES\(^2\)

<table>
<thead>
<tr>
<th>Expenditure Category</th>
<th>Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Research/Science/Innovation</td>
<td>$33,818</td>
</tr>
<tr>
<td>Administration</td>
<td>$5,374</td>
</tr>
<tr>
<td>Development and Public Relations</td>
<td>$2,435</td>
</tr>
</tbody>
</table>

Total Expenses from Continuing Operations: $41,627 (100.0%)

CAPITAL EXPENDITURES

<table>
<thead>
<tr>
<th>Expenditure Category</th>
<th>Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab and Core Facility Equipment</td>
<td>$470</td>
</tr>
<tr>
<td>All Other</td>
<td>$217</td>
</tr>
</tbody>
</table>

Total Capital Expenditures: $687

REPLACEMENT AND RENEWAL EXPENDITURES: $981

NON-OPERATING EXPENDITURES

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debt Principal Payments</td>
<td>$741</td>
</tr>
</tbody>
</table>

DEPRECIATION EXPENSE

<table>
<thead>
<tr>
<th>Expenditure</th>
<th>Expenditure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depreciation of Fixed Asset</td>
<td>$7674</td>
</tr>
</tbody>
</table>

\(^1\) Cash basis and excludes income/loss on Endowment investments and reimbursement for subcontracted research.

\(^2\) Excludes subcontracted research on Grants and Contracts and Depreciation Expense.
2022 Leadership

LEADERSHIP TEAM
Jim Carrington, PhD, President and CEO
Hal Davies, MBA, CPA, COO and VP for Finance
Tom Bander, MBA, VP of Development
Anna Dibble, MBA, VP of HR
Todd Hornburg, VP of Facilities and Special Services
Toni Kitchan, PhD, VP for Research
Donald MacKenzie, PhD, Exec. Dir. of IICI
Stephanie Regagnon, Exec. Dir. of Innovation Partnerships
Karla Roebel, VP of Public and Government Affairs

BOARD DIRECTORS
Todd R. Schnuck, Chair
Philip Needelman, PhD, Vice Chair
Teddy Bekele
Sara Yang Bosco
Blackford F. Brauer
Lee Broughton
Patrick O. Brown, MD, PhD
Mun Y. Choi, PhD
Desiree S. Coleman-Fry
Steven M. Fox
Richard A. Gephardt
James L. Johnson, III
Robert J. Jones, PhD
Wesley Jones
Ruth E. Kim, JD
Sanjeev Krishnan
Ann C. Marz
Andrew D. Martin, PhD
Anna E. McKelvey, LLM
Thomas C. Metzger
Penny Pennington
Robert Reiter, PhD
Kiersten E. Stead, PhD
Mary Stillman
Peter S. Wyse Jackson, PhD
John F. McDonnell, Emeritus Director

Board Participants
Christopher B. Danforth
Timothy J. Halls

Board Directors Elect
Lisa Ainsworth, PhD
Christopher B. Danforth
Jackie Joyner-Kersee
William L. Polk, Jr.

SCIENTIFIC ADVISORY BOARD
Eric Ward, PhD, Chair
Lisa Ainsworth, PhD
David Braun, PhD
Edward Buckler, PhD
Natalie DeLeon, PhD
Rebecca Doerge, PhD
Barbara Valenti, PhD

Bust of Dr. William H. Danforth in the Danforth Center touring corridor. Bill Danforth united people to create the Donald Danforth Plant Science Center, and with his final estate gift, he helped propel its future. His example challenges all of us to take action on big challenges.
**OUR MISSION**

Improve the human condition through plant science

As a world center for plant science research, our discoveries will help:

- Feed the hungry and improve human health
- Preserve and renew our environment
- Enhance the St. Louis region