

# 25 Years of Excellence

2023 ANNUAL REPORT



DONALD DANFORTH  
PLANT SCIENCE CENTER



# 25 Years of Excellence

Since 1998, the Donald Danforth Plant Science Center has brought together leading plant scientists from around the world to address humanity's most profound challenges. Today, the Danforth Center is the largest organization of its kind. Through our work, we seek to feed the hungry and improve human health, while preserving and renewing our environment. We believe in the power of science to lift families, communities, and nations from poverty and empower people everywhere to enjoy better health and a higher quality of life. With your support, we are changing the world for the better.

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## Letter from the Chair

The Danforth Center seeks to address the biggest challenges of the 21st century and to provide solutions in a hurry. In the five years I have served as board chair, the pace of discovery and delivery at the Danforth Center has accelerated dramatically, especially with the new Field Research Site fully integrated into operations.

The pages of this booklet are filled with the kind of news that inspires me to optimism about the future:

- Discoveries that can help us grow more food in a changing climate.
- Progress on improved food crops for Africa.
- A quick exit for a Danforth Technology Company spinout, helping to speed the product to market.

The work of the Danforth Center would not be possible without our community. Our Founding Chair, Bill Danforth, knew this and celebrated it: "Our people are willing to work together for a common good. That's a rare plus not present in every community."

It has been my sincere pleasure to work together with this community for the common good, and I look forward to continuing the work under new board chair Penny Pennington's leadership. By working together, all of us can make a difference. Thank you for your support.



*Todd R. Schnuck*  
Todd R. Schnuck

## Letter from the President

One of my favorite things to do with visitors is to take them on tours of the Danforth Center. Sure, they are usually impressed with the laboratories, robotics, and plant growth facilities. But they are often more impressed with the people they meet along the way. In this report, you will learn about many of those talented Danforth Center community members and their passion for using plant science to improve the human condition.

Whether it's a student from Washington University doing their graduate studies at the Danforth Center or a horticultural specialist working with scientific teams to produce plants for experiments, our people possess the magic that makes the Danforth Center such a special place. This year, we grew to nearly 450 Center community members who originate from about 35 countries around the globe. They come because of the unique opportunity to make a difference in people's lives through creative and impactful scientific research.

Our incredible people are doing difficult, challenging work. But they are enabled by generous supporters like you, and by the fact that you are invested in their success. On behalf of the entire Danforth Center, thank you!



*James C. Carrington*  
James C. Carrington

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Plant Science Center

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## Farms with Benefits

Agriculture currently accounts for ten percent of greenhouse gas emissions. But what if we could develop crops that help? Crops with the same or better productivity—that also capture more carbon, fix their own nitrogen, thrive on less water, and stop soil erosion? This is the vision of scientists at the Danforth Center who are working to create crops that can withstand the rigors of a changing climate, that can feed the world while also improving the environment.

*The **Danforth Center Field Research Site** is a crucial outdoor facility to explore how plants grow, perform, and interact with their environment. In 2023, the Field Site's first full year, there were 23 projects by eight principal investigators spread out over 62 acres. [Read more>>](#)*

sustainable agriculture

*The **Subterranean Influences on Nitrogen and Carbon (SINC) Center** is dedicated to developing technology that reduces the need for nitrogen fertilizer by promoting beneficial microbe-plant interactions, developing cover crops, and optimizing plant genetics. In 2023, SINC Center co-directors launched initiatives to better understand plant-bacteria nutrient exchange, elemental uptake, and published studies on cover crop root architecture and a field evaluation technique for biofertilizers. The goal? To find a way to feed the world while preserving the planet. [Read more>>](#)*

*Minirhizotron tubes allow researchers to track and study the hidden half of plants underground. In 2023, Danforth Center scientists led by **Dr. Katie Murphy**, director of the Danforth Center Phenotyping Core Facility, installed 404 minirhizotrons—and more are planned with support from The Bellwether Foundation to develop phenotyping systems at the Field Research Site. These root studies can help shed light on improving plants' uptake of nutrients and their interaction with soil microbes to grow more food with fewer inputs. [Read more>>](#)*



# preparing for the future

*The model plant Arabidopsis, which was used in the study. New research led by **Dr. Keith Slotkin** at the Danforth Center revealed that plants can pass on “memories” of high carbon dioxide to their offspring. This discovery opens the door for scientists to equip plants with the tools they need to adapt to rising levels of CO<sub>2</sub>, high heat, and other stressors associated with climate change.*

[Read more>>](#)

*As climate change influences daily and seasonal temperature patterns—such as warmer nights and winters—it is critical to better understand how plants interpret and react to thermal cues to ensure food security worldwide. In 2023, researchers in the lab of **Dr. Dmitri A. Nusinow** identified a new protein complex in plants that regulates temperature response by the circadian clock. It's an important step in work to develop crops that can continue to grow with the same or increased yields in a changing climate.*

[Read more>>](#)

*As part of the **Enterprise Rent-A-Car Institute for Renewable Fuels**, scientists explore the potential of plants to create green solutions for global energy challenges. In 2023, **Dr. James Umen** (pictured) and his team discovered a new gene in green algae that controls sex determination, opening the door for targeted breeding.*

[Read more>>](#)

*Meanwhile the lab of **Dr. Doug Allen** has uncovered an important role played by malic enzyme in enhancing soybean oil production. Both discoveries could prove important for developing sustainable green fuels and petroleum replacements.*

[Read more>>](#)



# Farmers on the Frontlines


Farmers around the world are on the frontlines in the fight against hunger. For smallholder farmers in Africa, the situation is particularly challenging. There are more people to feed, less land to grow crops on, and many of their crops have barely increased in productivity in the last fifty years. Add to this the effects of conflict and climate change. Danforth Center scientists are working to close the productivity gap and bring improved crops to Africa to increase food security and farmers' livelihoods.

*The Danforth Center helped pod-borer-resistant (PBR) cowpea over the regulatory finish line in Nigeria and Ghana. Today farmers are clamoring for these improved seeds, which diminish the need for expensive pesticides dramatically. In 2023, certified seed production in Nigeria jumped tenfold on a course to meet demand in coming years. **Dr. Donald MacKenzie**, executive director of the Danforth Center **Institute for International Crop Improvement**, led licensed seed inspector trainings in Nigeria and a seminar for the National Biosafety Authority of Ghana. [Read more>>](#)*

food security

cowpea






The storage root on the left shows the devastation caused by cassava brown streak disease—a virus that can destroy an entire cassava crop with little warning. At right: virus-resistant cassava developed by the Danforth Center and partners in East Africa. **Dr. Nigel Taylor** leads the **Virus-Resistant Cassava for Africa** (VIRCA Deployment) project. Confined field trials are taking place in Uganda and Rwanda. The crop is closest to farmers' hands in Kenya, where national performance trials—the final hurdle to regulatory approval—will be completed in 2024. [Read more>>](#)

# cassava




**Dr. Nadia Shakoor** inspects her lab's fonio crop in the Danforth Center greenhouse. Cultivated in Africa for more than 5,000 years, fonio is an ancient grain that hasn't benefited from much agronomic improvement...yet. A type of millet, fonio can grow on poor and marginal lands, making it an excellent choice for farmers confronting a changing climate. The Danforth Center is working to improve this grain—for the benefit of the millions of consumers and farmers in West Africa who eat fonio on a daily basis.

# fonio



**Dr. Getu Duguma** surveys his teff field trial at the Danforth Center Field Research Site. Teff is an ancient grain consumed by 80+ million people in Ethiopia. Dr. Duguma grew up on a farm there, so he knows first-hand what improved teff will mean for Ethiopian farmers. Teff has weak, slender stems and falls over due to its own weight and other environmental factors, leaving 25% of yield in the dust. Dr. Duguma and his team have developed short-stature teff that doesn't fall over. In 2023, the USDA cleared their improved teff for field trials without the burden of biotech regulation, and testing is now underway. [Read more>>](#)

# teff



Sorghum harvest in West Africa. Sorghum is the fifth largest cereal crop in the world. It can naturally withstand drought and heat, making it a leading climate-resilient crop. But little is understood of the genetics underlying this resilience—and if we knew more, we might apply that learning to other crops as well. Danforth Center scientist **Dr. Andrea Eveland** is working to change that. Sorghum is also poised to help mitigate climate change through the work of **Dr. Nadia Shakoor** to breed for bigger, deeper root systems that store more carbon. [Read more>>](#)

# sorghum



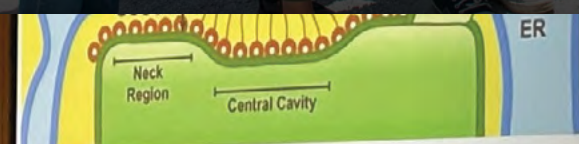
# Next-Gen Science

Inspiring the next generation of diverse scientists is fundamental to our future. By engaging young minds, we cultivate curiosity and passion for solving global challenges. Our educational programs, mentorship, and hands-on experiences empower future leaders to explore, innovate, and contribute to advancements in agriculture and environmental sustainability. Investing in the next generation ensures a pipeline of talent dedicated to addressing pressing societal issues and shaping a brighter future for our planet.

Students in the "Drone Ranger" camp learning about geospatial science. In a partnership with the Jackie Joyner-Kersey Food, Agriculture, Nutrition Innovation Center (JJK FAN), and with support from Boeing, the Danforth Center Education Research and Outreach lab launched a **geospatial science initiative** in the 2022-2023 school year. Students programmed and flew drones, collected data, and learned about intersections with plant science, geography, and scientific careers. [Read more>>](#)

student leaders

The 2023 **Research Experience for Undergraduates (REU)** internship class. Funded by the National Science Foundation, the REU has been part of the Danforth Center for 23 years. In 2023, more than 159 undergraduates from around the country competed for 21 spots in the rigorous 10-week program. Program organizers were **Dr. Tessa Burch-Smith** and **Dr. Kirk Czymmek**. [Read more>>](#)



Endoplasmic reticulum (ER)  
Cell wall (CW)  
Cytoplasmic sleeve (CS)  
Desmotubule (D)  
Central rod (CR)  
Plasma membrane (PM)  
Sporopores (SP)

a = <10 and 15 nm  
b = 30-50 nm

- Nutrients and metabolites
- Small RNAs
- Protein transcription factors
- **Hormones**

- PD are hijacked by viruses and pathogen effectors for movement

Graduate student Amie Fornah Sankoh made history at the Danforth Center on April 21, 2023 when she successfully defended her dissertation, becoming the first-ever Deaf, Black woman to receive a PhD in any STEM discipline. A student in the lab of **Dr. Tessa Burch-Smith**, Dr. Sankoh's research focuses on intercellular signaling in plants. [Read more>>](#)



# Innovation for the Future

Innovation lies at the heart of what we do at the Danforth Center. By pushing the boundaries of scientific discovery and technology, we strive to address global challenges such as food security, environmental sustainability, and climate resilience. Through collaborations with industry leaders, investors, and academic partners locally and around the globe, we aim to unlock new solutions at record speed. Innovation drives our science and fosters a future where plants play a pivotal role in building a more sustainable and resilient planet.

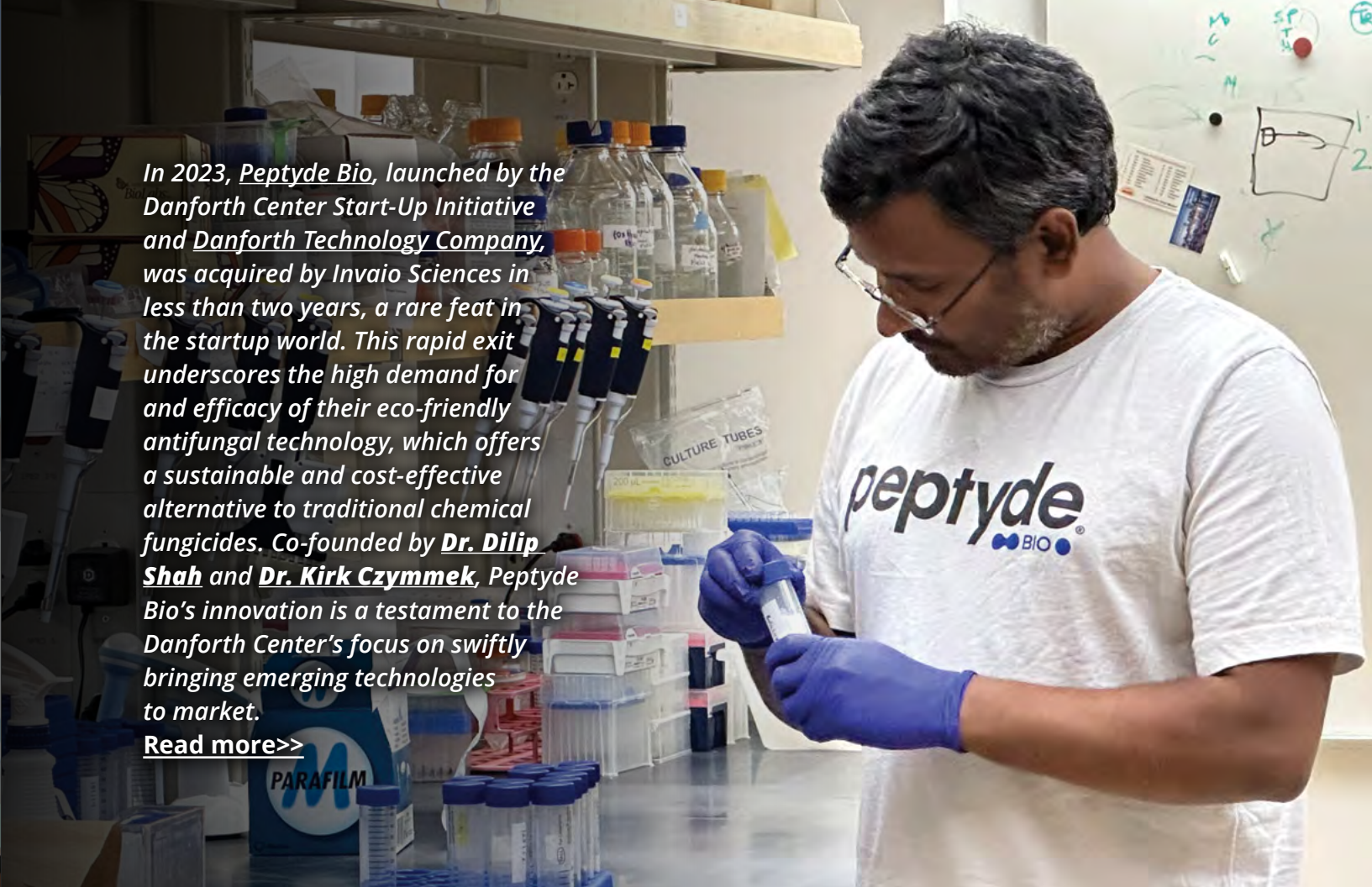
39 North Executive Director Emily Lohse-Busch at the announcement event. Seven institutions united in 2023 to launch **39 North AgTech Innovation District** as an independent 501(c)(3). Anchor institutions include the St. Louis Economic Development Partnership, Greater St. Louis Inc., City of Creve Coeur, the Danforth Center, CoverCress Inc., Benson Hill, and Bayer Crop Science. 39 North aims to bolster St. Louis as an agtech hub, promoting the region's robust innovation resources, strong talent pipeline, and strategic location. [Read more>>](#)

39 North: Now and



innovators welcome

In 2023, Peptyde Bio, launched by the Danforth Center Start-Up Initiative and Danforth Technology Company, was acquired by Invaio Sciences in less than two years, a rare feat in the startup world. This rapid exit underscores the high demand for and efficacy of their eco-friendly antifungal technology, which offers a sustainable and cost-effective alternative to traditional chemical fungicides. Co-founded by Dr. Dilip Shah and Dr. Kirk Czymmek, Peptyde Bio's innovation is a testament to the Danforth Center's focus on swiftly bringing emerging technologies to market. [Read more>>](#)



Led by the Danforth Center, BioSTL, Yield Lab LATAM, World Trade Center St. Louis, Greater St. Louis Inc., and 39 North, Cultivar STL was launched this year to boost partnerships with Latin America startups and ecosystems in agri-food tech. The first convening showcased St. Louis's strengths to more than 30 startup executives, investors, and leaders from eight countries. The program aims to create international research and business collaborations, advancing the region's competitive edge in ag and geospatial technology. [Read more>>](#)







*Agrela Ecosystems, founded by **Dr. Nadia Shako**, launched the PheNode®, an advanced environmental sensor platform, in 2023. With \$250,000 in early revenue and clients like the Taylor Geospatial Institute, PheNode aims to revolutionize data-driven agriculture and various industries through customizable, cutting-edge data collection technology.*

[Read more>>](#)



***Dr. Becky Bart** appeared at SXSW 2023, discussing the crucial role of microbes in human and environmental health. Her panel, “Plants, People & Planet: Microbes Rule Health,” highlighted the importance of microbiomes in agriculture, forestry, personalized medicine, and sustainability, emphasizing their potential to address climate change and other significant challenges.*

[Read more>>](#)



***Dr. Malia Gehan** presenting at the North American Plant Phenotyping Network conference, which she co-organized at the Danforth Center in February. The event was attended by hundreds of scientists from 15 countries. Gehan was recognized later in the year for her distinguished collaboration, when she was selected into the first class of Taylor Geospatial Institute fellows.*

[Read more>>](#)



*In 2023, the Danforth Center was named a **Top Workplace** by the St. Louis Post-Dispatch for the third year in a row. The award recognizes employers that score highly in the eyes of their employees. The Danforth Center was praised for its culture of cooperation, professionalism, open-mindedness, and excellence.*

[Read more>>](#)

Supporters

# Community Engagement and Contributions

Donors are essential partners in our mission. They are our investors, our volunteers, our brand ambassadors, our community builders. Together, Danforth Center community members and supporters expand our sphere and grow our enterprise in service to humanity. We are grateful.





## 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.

### 2023 FRIENDS COMMITTEE

|                         |                        |
|-------------------------|------------------------|
| Tim Halls, <i>Chair</i> | Roberta (Robbye) Frank |
| Traci Bennett           | Gary Halls             |
| Cicardi Bruce           | Phil Hellwege          |
| Bruce Buckland          | Ruth Kim               |
| Harold R. Burroughs     | Jim Klingler           |
| Molly Cline, PhD        | M. Paul Kravitz        |
| Joan Culver             | Gary Mindel            |
| Michael Davies          | Rashmi Nair, PhD       |
| Renee Denlow            | Jay Nouss, Jr.         |
| Steve Epner             | Tim Rodgers            |
| Martha Ferdinand        | John W. Rowe           |
| Glenn Fischer           | James R. von der Heydt |
| George Fonyo            | Matt S. Wolfe          |



"Members of the Friends Committee work hard to bring the Danforth Center mission to the public with the goal of building the donor community. Conversations: Big Ideas attracted record attendance this year, and we are excited to report increased membership in the Danforth Society, the Center's upper level giving society. Welcome and 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 2023, the events were in person and livestreamed. (*View recordings on our blog at [danforthcenter.org](https://danforthcenter.org).*)

### MAPPING THE FUTURE OF ST. LOUIS | MARCH 30

This evening offered a chance to learn about the future of agriculture and how plant science and geospatial science are intricately interwoven. The conversation took place between Taylor Geospatial Acting Director **Vasit Sagan, PhD**, Associate Professor of Earth & Atmospheric Science at Saint Louis University, and Danforth Center Principal Investigator **Allison Miller, PhD**, Professor of Biology at Saint Louis University. **Jason Hall**, CEO of Greater St. Louis, Inc., served as moderator.

[Read more>>](#)

### BIG IDEAS 3.0 | AUGUST 31

Combining TED Talks and Shark Tank, this inspiring evening featured three teams of early-career Danforth Center researchers, each pitching their concepts for how to use plant science to better our world. After each team's presentation, they faced questions from a panel that included **Benjamin Ola Akande, PhD**, SVP, Stifel Financial Corp and DLC chair; **Marilyn Bush**, President, Bank of America St. Louis; and **Janet Wilding**, Vice President of Business Attraction, Greater St. Louis, Inc. **Chip Lerwick**, Missouri Market Leader at Aon and DLC member, served as emcee. After an audience vote, Team Metablify was the announced winner and received a \$10,000 grant to jumpstart their idea for groundbreaking software to enable scientists to detect certain plant chemicals that are essential to nutrition and medicine.

[Read more>>](#)

Media sponsorship by:



At *Mapping the Future*, TGI's Dr. Vasit Sagan spoke with Dr. Allison Miller about how geospatial and plant science are enhancing the St. Louis region.



At *Big Ideas 3.0*, Team Metablify won the audience vote. Their big idea? A new tool to detect chemicals within plants that are essential to nutrition and medicine.

"The Danforth Plant Science Center is an excellent model, a blueprint, for Taylor Geospatial Institute's success."



- Vasit Sagan, PhD,  
*Acting Director, Taylor Geospatial 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.

### 2023 STEERING COMMITTEE

Matt Plummer, *Chair*  
 Jackie Hayes, *Vice Chair*  
 Erin Jones, *Vice Chair*  
 Davey Oetting, *Chair Emeritus*  
 Billy Barnes  
 David Culver, Jr.  
 Meghan Donovan  
 Nora Faris  
 John Ferrari  
 Chris Floyd  
 Matt Gambrell  
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 Michael Hollo, Jr.

Powell Kalish  
 Anna Krane  
 Zach Mandel  
 Ted Maritz  
 Jason Miller  
 Katie Murphy  
 Logan O'Connor  
 Drew Roznowski  
 Andrew Rzonca  
 Scott Smithson, Jr.  
 Klaire Whiteside  
 Dylan Zielonko



"The Danforth Center Young Friends aims to be the premier volunteer group in St. Louis. Our signature initiative is the Grow Challenge® Party with the Plants. In 2023, we raised more than \$110,000 for plant science innovation and local STEM education, making it one of our most successful events ever."

- Matt Plummer  
 Chair, Young Friends



Young Friends  
Steering Committee

## Grow Challenge®

During the pandemic, the Young Friends championed the Grow Challenge® Week of Giving, which is now the Danforth Center's annual online donation campaign. Party with the Plants, which was first held in 2017, is now the culminating event of the Grow Challenge.

PARTY WITH THE PLANTS | SEPTEMBER 29

On September 29, nearly 300 people joined in the fun, celebrating a successful Grow Challenge Week of Giving at Party with the Plants. This ticketed event saw St. Louis professionals enjoying cocktails and hors d'oeuvres, listening to live music and scientific demonstrations, and bidding on auction items. Altogether the Grow Challenge raised more than \$110,000 for plant science innovation and local STEM education, making this year's fundraiser one of our most successful ever.



Selfies and social media: it's a good time for a good cause. The Grow Challenge and Party with the Plants raised more than \$110,000 for Danforth Center STEM education and outreach, early-stage projects, and more.

### 2023 GROW CHALLENGE SPONSORS

#### Platinum

NOVUS®

#### Gold



BUNGE

CHRISTNER ARCHITECTS



#### Silver

BioBalance Health  
 CoverCress Inc.  
 Lewis & Clark Agrifood  
 Mandel, Mandel, Marsh,  
 Sudekum and Sanger  
 Maritz  
 Polsinelli  
 St. Louis Trust & Family Office

#### Bronze

Benjamin F. Edwards Investments  
 CMA Global  
 Color Art  
 Common Ground Public Relations  
 Conference Technologies, Inc.  
 CTC Genomics  
 Dive Bomb Industries  
 First Bank  
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 KWS  
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#### Food & Beverage Partners

4Hands Brewing Co.  
 Anheuser-Busch  
 Lohr Distributing  
 Nothing Bundt Cakes  
 Pedego Electric Bikes  
 Rootberry  
 Sugarfire Smokehouse  
 Switchgrass Spirits





Members of the Danforth Society and the St. Louis business community celebrated the Danforth Center innovation ecosystem at Toast to Innovation.



## Danforth Society Event

TOAST TO INNOVATION | OCTOBER 14

On October 14, members of the Danforth Center’s premier giving group, the Danforth Society, came together with leaders from the greater 39 North innovation district for a celebration of the Danforth Center innovation community. Speakers included Danforth Center President and CEO **Jim Carrington, PhD**; **Stephanie Regagnon**, executive director of innovation partnerships; and **Jerry Steiner**, co-founder and former CEO of **CoverCress**, who was the recipient of the Danforth Distinguished Service Award.

### 2023 TOAST TO INNOVATION SPONSORS

RiverVest Venture Partners  
Todd & Julie Schnuck  
Al & Elizabeth Gallegos  
Susan & Aaron Perlut

### 2023 DONORS

*who gave to support internships and training for early-career scientists*  
Carol Carlson (Don)  
George L. Fonyo  
Erin M. Jones  
Emily & Henning Lohse-Busch  
Gina & Matt Luetje  
Kenneth R. Mares  
Renee & Bruce Michelson  
Dennis & Carolyn Plummer  
Don Senti & Betsy Redfield  
Dulari & Dilip Shah



Danforth Center President and CEO Jim Carrington discussed the Danforth Center Start-Up Initiative designed to intentionally speed start-up creation from Center science and technology.



Denise Bertrand and Jerry Steiner. Jerry was presented with the Danforth Distinguished Service Award for his leadership and philanthropy in the innovation space.

## WHD Legacy Society

The Danforth Center is grateful to donors who have planned for future needs of the Center by designating a gift in their will or estate plans. To learn more about making a gift through your will or estate, visit [legacy.danforthcenter.org](https://legacy.danforthcenter.org).

### 2023 MEMBERS

Anonymous  
Mel<sup>†</sup> & Sue<sup>†</sup> Bahle  
Mr.<sup>†</sup> & Mrs. William J. Barnard  
Senator & Mrs. Christopher S. Bond  
William R. Boyle<sup>†</sup>  
Cicardi & Susan Bruce  
Ann Case<sup>†</sup>  
Dr.<sup>†</sup> & Mrs.<sup>†</sup> William H. Danforth  
Dr. Robert<sup>†</sup> & Lorene<sup>†</sup> Drews  
Elizabeth Early  
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George L. Fonyo  
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Mr.<sup>†</sup> & Mrs. David P. Gast  
Mrs. Charles Guggenheim  
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Dr.<sup>†</sup> & Mrs.<sup>†</sup> Ernest G. Jaworski  
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Nancy Knowles<sup>†</sup>  
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Mary<sup>†</sup> & Oliver<sup>†</sup> Langenberg  
William A. & Christine A. Linnenbringer  
The Mares Family Endowment  
Marilyn Miles  
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Philip<sup>†</sup> & Sima Needleman  
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Walter<sup>†</sup> & Marie<sup>†</sup> Schmitz  
Francine & Jerome<sup>†</sup> Seslen  
Steven C. Shepley  
Sanford<sup>†</sup> & Gloria Spitzer  
Moir Stevens<sup>†</sup>  
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Alice H. Vosburgh  
Ambassador<sup>†</sup> & Mrs. George Walker, III  
Mr. Blanton J. Whitmire<sup>†</sup>  
Mr. & Mrs. John J. Wolfe, Jr.  
Aleene Schneider Zawada

<sup>†</sup> Deceased  
Founding members of the society include Dr. William H. Danforth<sup>†</sup>, Mary<sup>†</sup> and Oliver<sup>†</sup> M. Langenberg, and Mrs. Jefferson L. Miller<sup>†</sup>.

## 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 LLP  
Matthew G. Perlow, Husch Blackwell LLP  
Bud Strong, Husch Blackwell LLP



“Bill Danforth’s legacy is the Danforth Center—and that was such an inspiration to us. We want to support organizations that benefit St. Louis as well as the world’s most critical issues.”

- William A. & Christine A. Linnenbringer  
WHD Legacy Society Members



## Danforth Leadership Council

*The Danforth Center is grateful to the Danforth Leadership Council, a group of prominent St. Louisans and corporate representatives interested in the role of plant science in the future of the region.*

### 2023 EXECUTIVE COMMITTEE

|                                   |                   |
|-----------------------------------|-------------------|
| Benjamin Ola Akande, <i>Chair</i> | Dennis M. Plummer |
| Christopher B. Danforth           | Michael Riney     |
| Natalie DiNicola                  | Michael Scully    |
| Chip Lerwick                      |                   |

### 2023 MEMBERS

|                          |                      |                      |
|--------------------------|----------------------|----------------------|
| Jane E. Arnold           | James L. Johnson III | William L. Polk, Jr. |
| Eleanor Peters Bergquist | Wesley Jones         | Sandy Rogers         |
| Robert Brandt            | John W. Kemper       | Brian Salmo          |
| Beau Brauer              | David Lemkemeier     | Jack Scott           |
| Jason Brauer             | Julie Lilly          | Jerry Steiner        |
| Lee Broughton            | Jason Logsdon        | Pat Tracy            |
| Johannes Burlin          | Aditya Malhotra      | Jeremy Williams      |
| J. Powell Carman         | Tim McCoy            | Heather Wood         |
| Li Cheng                 | Jeffrey McDonnell    | Amadou Yattassaye    |
| Charles K. Cohn          | Anna McKelvey        | Nancy Ylvisaker      |
| William O. DeWitt III    | Brett Moorehouse     | Jackie Yoon          |
| N. Timothy Ewing         | Ted Noel             |                      |
| Erin Fitzgerald          | James R. Nowicke     |                      |
| Steven M. Fox            | Jennifer O'Connor    |                      |
| Marc D. Goldstein        | Jack Oliver          |                      |
| Ted A. Guhr, Jr.         | Chuck Orban          |                      |
| John Haffenreffer        | Aaron Perlut         |                      |
| Jason R. Hall            |                      |                      |
| Craig Herron             |                      |                      |
| A. Charles Hiemenz, IV   |                      |                      |
| Qiaoni "Linda" Jing      |                      |                      |
| Brendan Johnson          |                      |                      |



"The Danforth Leadership Council continues to grow and expand the Center's stakeholder base. In 2023, we were pleased to welcome new corporate members and to support the next generation of emerging scientists at Big Ideas 3.0. We are grateful to all who contributed."

*-Benjamin Ola Akande, PhD  
Chair, Danforth Leadership Council*



*Panelists at the second IGNITE discussed ways to improve collaboration and partnership around the world to increase the odds of solving the climate crisis.*



## Ignite

Launched in 2023, the IGNITE series put a fresh spin on innovation and entrepreneurship at the Danforth Center. The series brought nationally renowned speakers and panelists who presented and discussed leading-edge ideas for "inspiring innovative impact."

### THE MINDSET WE NEED TO CREATE THE FUTURE WE WANT | AUGUST 8

The inaugural event of IGNITE brought well-known futurist, TED-talker, and bestselling author **Nancy Giordano** to the stage. She spoke on "2030+ *Beyond Economy: The Mindset We Need to Create the Future We Want.*" In a wide-ranging talk that touched on many subjects from AI to reinventing the internet, Giordano focused on what we need to create the more sustainable, inclusive, and dynamic solutions the future demands.

[Read more>>](#)

### CONNECTING GLOBAL ECOSYSTEMS FOR GREATER IMPACT | OCTOBER 18

With a central premise—that solving our climate crisis will require radical collaboration at the frontier of science and social action—this Ignite welcomed a panel of top experts to discuss opportunities for international collaboration. Panelists included **Gabriela Burian**, Global Director for Multi-Stakeholder Partnerships, **Bayer Crop Science**; **Luis Fernandez Zang**, Senior Investment Officer, **IDB Group**; and **Mark Jarman**, Founder and Consultant, **AgriTIERRA Ltd.** **Teresita Di Marco**, Principal, **The Yield Lab LATAM**, served as moderator.

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*IGNITE events bring together innovators and entrepreneurs from across the region—and the globe—in the belief that big challenges require people working together to find solutions.*

"The good news is that we can change the future. [...] We have the opportunity, if not the responsibility, to go build the better story."



*- Nancy Giordano, futurist and speaker at Ignite*



## Corporate Partners

The Danforth Center is grateful to our corporate, industry, and organization partners for their generous support in 2023.

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Plastomics  
Seven Pines Garden Club  
Vulpes Agricultural Corp.



In 2023, the [Wells Fargo Innovation Incubator \(IN²\)](#) announced its 5th agtech cohort, focusing on “climate-aligned agriculture” startups. Partnered with Danforth Center scientists, these agtech companies receive financial support and investor access. Three of the companies have St. Louis ties: [HabiTerre](#), [Impetus Ag](#), and [Impossible Sensing](#).

[Read more>>](#)

## Docents

The Danforth Center is grateful to our highly trained docents who led tours and increased public awareness of the Danforth Center in 2023.

### 2023 DOCENTS

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

Docent Steve Epner leads a tour through the greenhouses. Docents are often scientists, academics, and entrepreneurs who volunteer their time to promote the Danforth Center mission.



# Remembering A Scientist-Entrepreneur

In January 2023, Dr. Todd C. Mockler, 52, unexpectedly passed away. Dr. Mockler was the Geraldine and Robert Virgil Distinguished Investigator at the Danforth Center, where he had been a member since 2011. He was a renowned scientist-entrepreneur who helped marry big data to plant science, and who successfully translated his discoveries into real-world agtech solutions as cofounder of Benson Hill. Todd will be deeply missed.



## 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 2023. To make a tribute, visit [danforthcenter.org/donate](https://danforthcenter.org/donate).

**In Honor of...**

- Jane Bond**  
Ms. Martha W. Bond  
Mr. & Mrs. Lary Bozzay
- Teri & Jim Carrington**  
Mrs. Carol R. Armstrong
- Katie Claggett**  
Mr. & Mrs. Birch Mullins
- Maxine Clark & Bob Fox**  
Mr. & Mrs. Kenneth Kranzberg
- Senator John C. Danforth**  
Ms. Margot Miller
- Glenn Fischer**  
Anonymous  
Terri Fischer
- Ted Guhr**  
Mrs. D'Arcy Elsperman
- Gary Halls**  
Tim Halls
- Ruth Kim**  
Anna & Wayne Crosslin
- Dr. Allison Miller**  
Mary Ellen Miller
- Rev. John B. Musgrave**  
Mr. & Mrs. Michael Rich
- Karen Stern**  
Mr. & Mrs. Kenneth Kranzberg
- Sarah & Dan Wessel**  
Tim Halls
- Rose Winkel**  
Ms. Anne Leners

- Jean Wright**  
Ms. Sandra L. Richardson
- Bing Yang**  
Dudley & Beth McCarter
- In Memory of...**
- Roxanne Astroth**  
Mr. & Mrs. William Astroth, Jr.
- William H. Danforth**  
Mr. & Mrs. Blackford F. Brauer  
Tom & Meg Claggett  
Mr.† & Mrs.† David C. Farrell  
Mr. & Mrs. Michael Rich  
Sandy & Laing Rogers  
Mark & Senator Jill Schupp
- Derick Driemeyer**  
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Melissa Rung-Blue & David Blue
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Susanne W. Shepherd
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Dr. Alison Bedell
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John & Anne McDonnell
- Thomas E. Thompson**  
Anonymous
- Geraldine Virgil**  
Tom & Cindy Bander
- Francis & Estelle Walls**  
Anonymous
- Betty Woyak**  
Mr. & Mrs. Harold Denlow
- Gene Zafft**  
Mrs. Marlene D. Zafft

In 2023, Danforth Center Principal Investigator **Dr. Bing Yang** was elected a fellow of the American Association for the Advancement of Science. Yang earned his place in this prestigious group due to his distinguished contributions to plant pathology and gene editing in rice. [Read more>>](#)







## Principal Investigators

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Doug Allen, PhD, *Member, USDA Research Scientist*  
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 Ivan Baxter, PhD, *Member*  
 Armando Bravo, PhD, *Assistant Member*  
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 Toni Kutchan, PhD, *Member, Oliver M. Langenberg Distinguished Investigator, VP - Research*  
 Blake Meyers, PhD, *Member, Professor of Plant Science, Mizzou*  
 Allison Miller, PhD, *Member, Professor of Plant Biology, SLU*  
 Todd C. Mockler†, PhD, *Member and Geraldine and Robert Virgil Distinguished Investigator*  
 Dmitri A. Nusinow, PhD, *Associate Member*  
 Sona Pandey, PhD, *Member*

Dilip Shah, PhD, *Associate Research Member*  
 R. Keith Slotkin, PhD, *Member, Professor of Biological Sciences, Mizzou*  
 Nigel Taylor, PhD, *Member, Dorothy J. King Distinguished Investigator*  
 Christopher Topp, PhD, *Associate Member*  
 James Umen, PhD, *Member, Joseph Varner Distinguished Investigator*  
 Xuemin (Sam) Wang, PhD, *Member, E. Desmond Lee Professor, UMSL*  
 Bing Yang, PhD, *Member, Professor of Plant Science, Mizzou*  
 Ru Zhang, PhD, *Assistant Member*

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### 2023 SENIOR RESEARCH SCIENTISTS

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 Molly Hanlon, PhD  
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To learn about each scientist's research area, scan the code below.



† Deceased

The Danforth Center community was deeply saddened by the sudden passing of Dr. Todd C. Mockler on January 6, 2023. Read more on the following page.



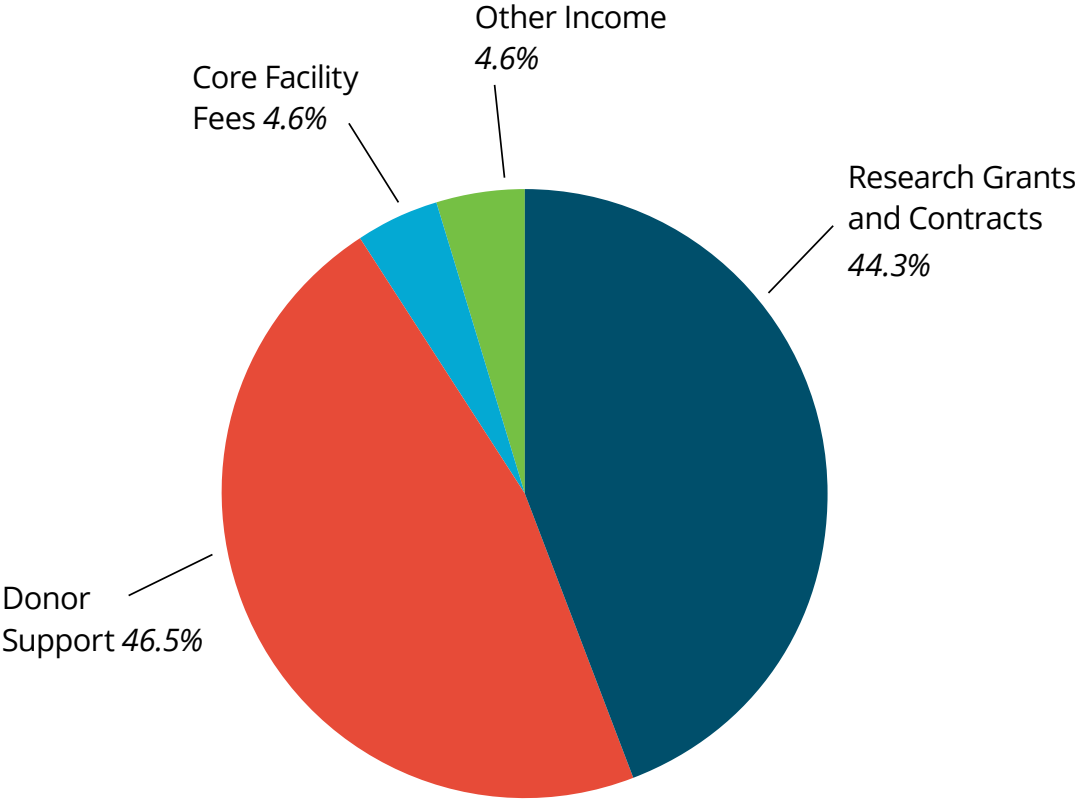


Selected Financial Data

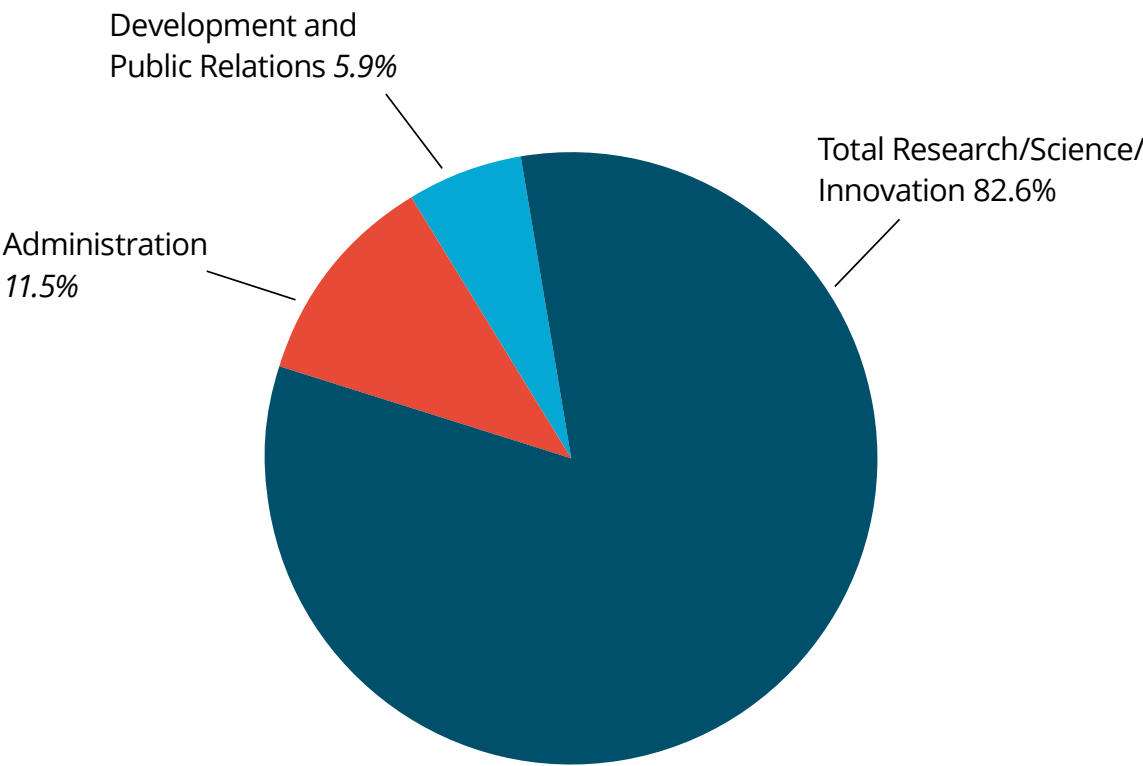
Fiscal Year Ended December 31, 2023  
(Unaudited)

| 2023 (\$000's)  |          |       |
|---|----------|-------|
| UNRESTRICTED OPERATING SUPPORT AND REVENUE <sup>1</sup> |          |       |
| Research Grants and Contracts                           |          |       |
|   |          |       |
| Donor Support   |          |       |
| Unrestricted Donor Gifts                                | \$2,328  | 4.5%  |
| Gifts Released from Restriction                         | \$1,438  | 2.8%  |
| Endowment Draw  | \$20,096 | 39.2% |
| Core Facility Fees                                      |          |       |
| Other Income  |          |       |
| Total Operating Revenues                                |          |       |
|   |          |       |
| OPERATING EXPENSES <sup>2</sup>                         |          |       |
| Total Research/Science/Innovation                       |          |       |
| Administration  |          |       |
| Development and Public Relations                        |          |       |
| Total Expenses from Continuing Operations               |          |       |
|   |          |       |
| CAPITAL EXPENDITURES                                    |          |       |
| Lab and Core Facility Equipment                         |          |       |
| All Other   |          |       |
| Total Capital Expenditures                              |          |       |
|   |          |       |
| REPLACEMENT AND RENEWAL EXPENDITURES                    |          |       |
|   |          |       |
| NON-OPERATING EXPENDITURES                              |          |       |
| Debt Principal Payments                                 |          |       |
|   |          |       |
| DEPRECIATION EXPENSE                                    |          |       |
| Depreciation of Fixed Asset                             |          |       |

2023 Unrestricted Operating Support and Revenues<sup>1</sup>



2023 Operating Expenses<sup>2</sup>



<sup>1</sup> Cash basis and excludes income(loss) on Endowment investments and reimbursement for subcontracted research.  
<sup>2</sup> Excludes subcontracted research on Grants and Contracts and Depreciation Expense.





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