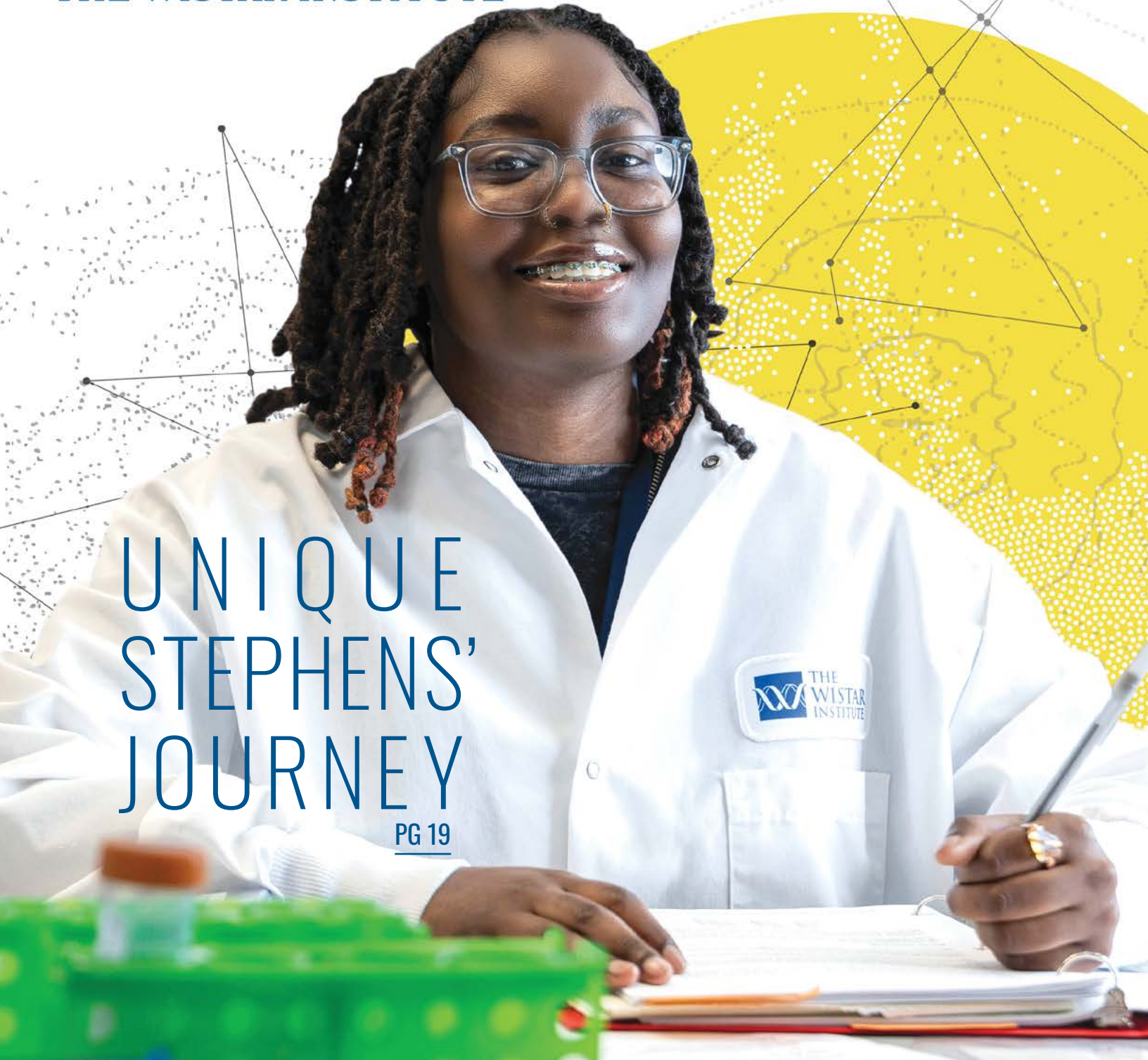


# FOCUS

THE WISTAR INSTITUTE



## UNIQUE STEPHENS' JOURNEY

PG 19



# IN THIS ISSUE



**2**

CEO INTERVIEW  
Dr. Dario C. Altieri

**4**

WISTAR SCIENCE  
Teaching About  
Vaccine Discovery  
& Development

**8**

DONOR SPOTLIGHT  
Cancer Center  
Receives Caplan  
Name



**10**

COLLABORATIONS  
GSK Support Trains  
Future Scientists



**16**

RESEARCHER  
PROFILE  
Dr. Noam  
Auslander on  
Machine Learning

**19**

Q&A FOCUS  
Unique Stephens'  
Journey to Wistar



**12**

EDUCATION  
PCOM and Wistar  
Join Forces



**22**

**Bold Science // Global Impact**  
Gift Creates New  
Endowed Fund

**14**

IN MEMORIAM  
Doris Taxin

# Creating Momentum from Curiosity: How Wistar Science Fuels the Future

## What makes Wistar's recent growth distinctive?

It's been a tremendous time of excitement for Wistar, and our growth is driven by pursuing and fulfilling our mission in discovery and new research advances that remain at the forefront of medicine and biology. The biggest driver of our expansion has really been the success of what science

has brought to the forefront. Take the COVID-19 epidemic as an example. It created a renewed appreciation of what science can and should do: conquer disease and bring new agents to the market in record time. Combined with our mission to remain laser-focused on discovery research — without distractions — that has really been rocket fuel for Wistar to move forward.

**Dr. Dario C. Altieri**

*Our growth is driven by pursuing and fulfilling our mission in discovery and new research advances*

## How does the success of the regional biotechnology and life science sector factor into Wistar's success?

I believe that Wistar is a unifier for this ecosystem: the academic institutions, private biotechnology companies, and the larger pharmaceutical industry. Together, they serve not only as an economic engine, but also as a way to bring new jobs to the region, create a stable workforce, and ultimately, drive innovation. Wistar has been part of this ecosystem from the very beginning, and I think that is reflected in our position in that ecosystem. Ninety percent of our publications are the result of collaborations, and more than 70% of our funding from the federal government is the product of collaboration. I like to think of ourselves as an integral player in the Philadelphia region.

## Wistar recently announced a new Center for Advanced Therapeutics. Can you explain what success looks like for this new Center?

We're very excited about the opportunity to start the new Center for Advanced Therapeutics. What we hope to accomplish with the new Center is to create opportunities for new assets that could be developed into something that will eventually end up on the market and help people. The idea of the Center for Advanced Therapeutics is to learn more about the biology of disease and the pathways that lead to advanced cancer or infectious disease, and then identify new elements or agents that could disrupt those pathways. Then we collaborate with the pharmaceutical industry, the biotechnology industry, or academic institutions to advance those assets. The goal is to have a Center staffed by six to seven new faculty members, including a prominent, world-renowned director, that will facilitate taking new assets to early-stage clinical trials in collaboration with some of the great health systems in the Philadelphia region.

## Will the Center for Advanced Therapeutics help expedite the length

## of time it takes to take a discovery from bench to bedside?

The timeframe to take a discovery to market is excruciatingly long. If everything goes well, it typically takes around 15 years, and the success rate is probably one in a million, which is unacceptable. What we need to do is understand the pathway better, understand the disease and the biology better, so we have viable targets. Having a concentrated effort on new therapeutics could certainly shorten the path from discovery to early-stage clinical testing. The Center will facilitate Wistar's collaboration with regional health systems on innovative, early-stage clinical trials for something totally new.

## What role does Wistar science play in foundational biomedical research? Why is it important?

When it comes to biology and medicine, basic biomedical research is just not enough. It has to be linked somehow to mechanisms of disease. Wistar has a long-standing tradition of doing just that: learning about immunology and infectious disease while also developing new

vaccines; learning about immunological responses, while simultaneously pursuing antibody therapies that could eventually become new drugs. We've done this as an organization for more than 100 years, and we've had notable successes in bringing new agents to the market. What started as research tools became safe and effective medicines that have changed the lives of millions.

## If there's one thing that you want people to know about Wistar, what would that be?

I think the one thing that Wistar has that is unique and stands out amongst its peers is a culture of collaboration, a culture of synergy, and a culture of focused research. And that culture goes back to a word I use a lot: curiosity. The scientists that come here have the freedom to pursue their own curiosity and their own ideas. Nobody is telling them what to do, or how to do it. Nobody is telling them what to focus on, or what to research. They are here to pursue their own ideas and their own dreams. And I think that is important and unique about our organization because it creates momentum and an energy that is self-perpetuating, and it can be very infectious in a positive way.



# Teaching Students about Vaccine Discovery and Development



## INSIDE DR. DAVID WEINER'S VACCINES AND IMMUNE THERAPEUTICS CLASS

Since 1997, Wistar's Dr. David Weiner has taught Vaccines and Immune Therapeutics for the University of Pennsylvania's Perelman School of Medicine. After joining The Wistar Institute — where he serves as executive vice president, W.W. Smith Charitable Trust Distinguished Professor in Cancer Research, and director of the Vaccine & Immunotherapy Center — Dr. Weiner continued leading the class, which features world-class experts from an eminent roster of the best in vaccinology. Dr. Weiner's 13-week fall semester course is noted for its pragmatic approach to the science and process of vaccine design, with students hearing from the field's most trusted experts.

### Where did the idea to start this course come from?

Starting the course was a group effort: Paul Offit<sup>1</sup>, Stanley Plotkin<sup>2</sup>, Maurice Hilleman<sup>3</sup>, and myself. Then Emilio Emini<sup>4</sup> and Kathrin Jansen<sup>5</sup> joined shortly after, right at the beginning; point is, we had very big names.

There was a prevailing mood in the late '80s and early '90s that infectious disease had basically been conquered. Now, take a look around you: that's obviously not true. But that was in the air at the time, and there weren't any

courses focusing on vaccines as such; all the immunology lectures tended to focus on the immunology theory, and if they wanted to get into the nitty-gritty, they'd talk about how mice respond to vaccines. But not how human immune systems respond to vaccines, which is what's important for stopping infection in the real world.

At the time, my career had turned from cancer immunotherapy to vaccine technology. As a faculty member, I was building a new program in DNA vaccines, and I was working with all these

vaccine people. We realized we had this gap in how we were teaching the students, so we started a course dedicated to how vaccines are actually made: how you design them, how you test them, how humans respond to them, and so on. And it isn't just the science, although that's the biggest part. Students learn that designing a vaccine in the lab is one thing, but it's almost another challenge entirely to put shots in people's arms — how scientists need to prepare for regulatory and market forces when designing vaccines. | CONTINUED



### What do the students learn?

Students who enroll should have background on the fundamentals of immunology, so that gives us the opportunity to get into the weeds on vaccine topics. That could be anything from how adjuvants are used in vaccines — which, by the way, are essentially immune irritants that you can put in a vaccine to make it more effective — to the procedural steps involved in actually getting a vaccine to market.

But I think what's really made this class special and such a hit for more than two decades is the caliber of the lecturers. We have a Who's Who in vaccinology talking with our students. They get to learn from Kathrin Jansen, for example — who led the development of Gardasil®, the first HPV vaccine — or, before he passed away, Maurice Hilleman, who I think has probably saved more lives than anybody else in history through his work at Merck. Students saw successes and failures throughout the years, like when the license

for the rotavirus vaccine was announced or when the clinical trial for one of the first HIV vaccines failed; if you're enrolled in this course, you're up close and personal with the field in a way that, unless you already work in it, is unparalleled.

*One thing I remind the students of, too, is that their access to the folks we have lecturing is an almost untold privilege; even working scientists may not ever speak with these superstars.*

Let me put it this way: you're not talking to Emilio Emini unless you're from someplace like CNN. And even then, it's a question of whether he has time to step away from

his work with Bill Gates. So when you ask why the course is so popular, I have to point to whom we've been able to recruit; our students learn from the best of the best.

### If this course were taught in, say, the '60s, how would the lectures be different? How has the field evolved?

I think one of the great things about this course in particular is that it really captures the constant shift of technology. Even in the '90s, we were still mostly talking about live attenuated vaccines — the fundamental idea that a weakened pathogen can teach the immune system how to fight the real thing.

There's nothing wrong with live attenuated vaccines; we don't see polio anymore thanks to live attenuated vaccine design. But the field has grown so much since then, and our students get to see those advances almost in real time. Sea changes and shifts happen pretty frequently in vaccinology. We've seen the rise of adjuvants as vaccine



enhancers; there's been the development of DNA vectors, like the kind my lab works on; and then, of course, you have the mRNA revolution, which happened right before the students' eyes when the COVID mRNA vaccines were developed at a record pace. Just this year, Drew Weissman<sup>6</sup> wins the Nobel Prize on a Monday, and he's here at Wistar teaching the class that Wednesday — where else do you have that?

This course was only started in '97, so I don't think any of our students have vaccines to their names yet. But

the students who take this course frequently get jobs in academia or industry, and they're well-prepared because they had the tremendous opportunity to hear firsthand from the most trusted experts in the field.

*In terms of total lives saved, I don't think any technology competes with vaccination.*

*It's our number one tool for fighting deaths caused by viruses.*

Making sure that our students can learn from the best and brightest in vaccinology paves the way for a new generation of experts — and many more millions of deaths prevented.

1. Paul Offit, M.D., Maurice R. Hilleman Chair of Vaccinology at the Perelman School of Medicine

2. Stanley Plotkin, M.D., Professor Emeritus, The Wistar Institute

3. Maurice Hilleman, M.D., former Senior Vice President of Merck Research Labs

4. Emilio Emini, Ph.D., CEO of The Bill and Melinda Gates Medical Research Institute

5. Kathrin Jensen, Ph.D., former Head of Vaccine Research and Development at Pfizer

6. Drew Weissman, M.D., Ph.D., Roberts Family Professor in Vaccine Research at the Perelman School of Medicine and 2023 Nobel Laureate

## Bold Science // Global Impact

# Wistar Unveils Caplan Cancer Center Sign Recognizing Family's Campaign Gift

A gathering of Wistar employees, donors, and senior leaders assembled outside The Wistar Institute on February 13 to unveil a new tribute to a family that has made an indelible impact on the Institute: Ellen and Ronald Caplan.

With Ellen, Ron, and their son Matthew Caplan looking on, Dr. Dario C. Altieri, president and CEO of The Wistar Institute, removed a blue fabric drape to reveal the permanent sign, which reads "Ellen and Ronald Caplan Cancer Center."

The tribute was installed to recognize the Caplan family's principal gift for Wistar's National Cancer Institute (NCI)-designated Cancer Center. Ron, who is the founder and president of PMC Property Group, Inc. and a Wistar Trustee since 2009, and Ellen, chair of the Philadelphia Museum of Art Board of Trustees, made the gift to empower Wistar's world-leading scientists in their search for high-impact discoveries toward promising cancer therapies. As chair of

Wistar's Bold Science // Global Impact Campaign, Ron has contributed his leadership to help raise more than \$50 million to power Wistar Science.

During a reception following the unveiling, Dr. Altieri explained why philanthropy plays such an important role in advancing Wistar Science. "Wistar philanthropy is about the future — the promise and the hope for discoveries that have yet to be made," he said. "We've learned science can transform the world, and we cannot be more grateful for people like the Caplans, who have the vision to support that spirit of discovery."

Ron explained that his family has been directly impacted

by cancer, and the gift is intended to help accelerate future discoveries that could lead to therapies and cures for the disease.

"My son Matthew lost his grandmother to cancer when she was just 52. Today, she would have lived because of the great scientists that are here every day, trying to make the world a better place," he said to a room full of Caplan friends, colleagues, and family, alongside Wistar Board members, Institute supporters, and staff. "Ellen and I are thrilled that we're able to make this gift to Wistar, and I'm honored that I'm lucky enough to be able to contribute to a place that is so wonderful."



Ellen Caplan, right, with her parents, Richard and Ellen Ryan, in front of a new sign recognizing the Caplan family for their gift to the Wistar's National Cancer Institute (NCI)-designated Cancer Center.



Ron Caplan, right, stands with son Matthew during the Caplan Cancer Center Sign unveiling in February.

**Bold Science // Global Impact**  
THE WISTAR INSTITUTE

The **Bold Science // Global Impact Campaign** for Wistar is the largest and most successful fundraising initiative in the Institute's history — and you're invited to be a part of it! Scan the QR code or visit [boldscience.wistar.org](https://boldscience.wistar.org) to learn more.

"Wistar philanthropy is about the future — the promise and the hope for discoveries that have yet to be made."

DARIO C. ALTIERI, M.D.



## Expanding Pathways to Careers in Science in Underrepresented Communities

**Thanks to support from GSK, Wistar's education and training programs offer underrepresented communities throughout Philadelphia and beyond pathways to life science careers.**

As any nonprofit knows, it takes a village to keep an organization running – a village of funders, to be exact. For The Wistar Institute, funding is an essential part of its research mission, enabling Wistar scientists to pursue early-stage biomedical discovery, and to train a diverse and inclusive group of students in the many career opportunities in the life science sector.

Those funds can come from a variety of sources, including state and federal agencies, private individuals, charitable foundations, and established corporate entities.

Wistar is thankful to the global biopharma company GSK for their long-standing and generous support. The funding received has helped support and grow the programs in Wistar's Hubert J.P. Schoemaker Education and Training Center. Through GSK's most recent support, Wistar has been able to

expand a tissue culture room dedicated to training, give more students access to essential equipment, and add additional cohorts that allow more students to develop the skills they need to enter the life science workforce.

Erica Henderson, director of U.S. Charitable Investments for GSK, explained that the company has three themes that it uses to guide investments: health for the people; health for the planet; and innovators for the future. "The 'innovators for the future' pillar includes all the STEM initiatives that we support, to increase the number of individuals – specifically people who are underrepresented in STEM – that are going into STEM careers," she said. "That's where Wistar comes in."

GSK's support of Wistar increased in 2020, when they established the Philadelphia STEM Equity Collective, a 10-year, \$10 million collaborative effort aimed at increasing the number of Black people, Latinx people, and women who are pursuing STEM careers. Wistar was one of the first groups of grantees of the Collective, receiving a \$250,000 contribution.

“  
I had the opportunity to witness one of the labs at Wistar and see the students and the excitement in their faces – it warms my heart.”

ERICA HENDERSON  
Director of U.S. Charitable Investments, GSK

Henderson said the goal of the effort is to provide underrepresented communities with expanded access to STEM education and the careers that follow. "We committed \$10 million in the Philadelphia region – \$1 million each year – to support programs that move the needle to increase the number of Black people, Latinx people, and women going into these STEM careers," she explains. "Over that 10-year period we hope to measure what the long-term impact is in the sector."

With multiple facilities in the Philadelphia area, including their US headquarters, and a booming life science sector, GSK felt the region was an ideal candidate for investment. "Philadelphia has approximately 38,000 STEM workers, and about 57% of them identify as white and two-thirds are men," explains Henderson. "Considering those statistics, and since Philadelphia is a life science hub, we felt it was important to focus on programs where some communities are underrepresented. It just made sense that we start where GSK has one of their largest employee footprints."

Dr. Kristy Shuda McGuire, Wistar dean of Biomedical Studies, says that the funding gives her team the chance to offer a robust, advanced training curriculum that is based on authentic Wistar Science. "We are extremely lucky and thankful to have funding from

GSK. Funding is essential for bringing the most relevant science and technology to our students," she says. "Whether it's from GSK or other sources, that support allows us to obtain the equipment and facilities we need, and to expand our programs and offer them to even more individuals in the region."

Henderson asserts that Wistar's education and training programs are perfectly aligned with GSK's commitment to supporting underrepresented communities. "They're making sure that there are more students of color and women entering STEM fields, and that they're given the opportunities to pursue those careers."



Erica Henderson (center), director of U.S. Charitable Investments at GSK, and her colleague Linda Higginbotham, manager of U.S. Charitable Investments, during a tour of the Wistar training lab.

In October 2023, Henderson and her colleague Linda Higginbotham, manager of U.S. Charitable Investment at GSK, had a chance to visit Wistar, tour the facility, and see first-hand how their support was being applied, something that Henderson says is a highlight of her role. "I had the opportunity to witness one of the labs at Wistar and see the students and the excitement in their faces – it warms my heart," she says. "It makes me proud that GSK is committed to this investment and that I get to lead a team that's supporting these efforts."

COLLABORATIVE CANCER BIOLOGY GRADUATE PROGRAM

*Combines Collective Expertise of Wistar and PCOM*

On April 29, Philadelphia College of Osteopathic Medicine (PCOM) president and CEO Dr. Jay S. Feldstein, along with PCOM Dean of the School of Health Sciences Dr. Gregory McDonald, took a walk through the halls at Wistar to mark a milestone in their academic collaboration with the Institute: the launch of a highly anticipated Cancer Biology Ph.D. Program aimed at advancing research and cultivating the next generation of leaders in the fight against cancer.

“This announcement signifies a pivotal moment in our collaboration with Wistar, and a continuation of our commitment to offer world-class medical education and research,” remarked Dr. Feldstein.

“Together, with Wistar’s expertise and resources, combined with PCOM academic

excellence, we will continue to push the boundaries of scientific knowledge to confront the complexities of cancer and improve outcomes for patients everywhere.”

The Cancer Biology Graduate Program — jointly administered by Wistar and PCOM — will train individuals for a successful academic or industrial career in cancer biology and drug development.

The comprehensive, integrated program is centered on the involvement of both Wistar and PCOM faculty and provides an inclusive, broad-based graduate educational venue that complements and expands existing opportunities for cancer training in the Greater Philadelphia region. At the conclusion of their studies, successful candidates will be granted a Ph.D. in cancer biology from PCOM.



This collaboration with PCOM means Philadelphia now has a new biomedical science Ph.D. program to support our region’s growing life science sector. Wistar’s innovative research programs are in lockstep with PCOM’s new life science sector degree program.

DR. DARIO C. ALTIERI

*Wistar president and CEO, Director of the Ellen and Ronald Caplan Cancer Center and the Robert and Penny Fox Distinguished Professor in Cancer Research*



Dr. Jay S. Feldstein, president and CEO of PCOM (left) and Dr. Gregory McDonald, dean of the School of Health Sciences at PCOM (right), joined Dr. Dario C. Altieri for a tour of Wistar’s lab facilities.



Dr. Kristy Shuda McGuire, Wistar’s dean of Biomedical Studies, shows Dr. Feldstein and Dr. McDonald Wistar’s training lab.

“Our hope is that by harnessing the collective expertise of PCOM’s esteemed faculty and the renowned researchers at Wistar, we can accelerate discoveries, develop innovative therapies, and, ultimately, bring hope to those affected by cancer,” said Dr. McDonald. “This collaboration exemplifies our shared dedication to achieving those goals.”

The launch of the program follows the earlier announcement of a collaboration to offer degree programs, courses, and other educational opportunities in biomedical

sciences to students at each institution. As part of that initiative, PCOM and Wistar recently received grant funding from VentureWell to support bioentrepreneurship training. The program, culminating in a “Shark Tank”- style event at Wistar, is designed to promote the training of diverse, underrepresented scientists to pursue careers in the biotechnology industry and/or participate in the technology transfer process that facilitates bringing innovations to the bedside and market.



# Doris Taxin 1945~2024



*“Wistar held a very special place in my mother’s heart. She believed wholeheartedly in all the work Wistar is doing to alleviate the challenges of brain tumors.”*

*Erica Taxin, daughter of Doris Taxin*

IN 1992, Albert Taxin — a well-known Philadelphia-area native and restaurateur who ran one of the city’s most prominent restaurants, Old Original Bookbinders — was diagnosed with an incurable and inoperable brain tumor. Less than 15 months later, after multiple attempts at treatment, Albert succumbed to the highly invasive and rapidly migrating tumor, known as glioblastoma multiforme. He was 53 years old.

Albert’s wife, Doris Taxin, immediately made it her life’s mission to do whatever was necessary to help ensure others would not be afflicted with the disease. In 1993, she joined The Wistar Institute’s Board of Trustees and began work on establishing a fund that would help support research on glioblastoma and other brain cancers. That effort turned into what was one of the Institute’s most successful fundraising events, raising \$690,000 during an evening reception to establish the Albert R. Taxin Brain Tumor Research Fund.

Over the years, Doris continued to contribute to brain cancer research efforts at Wistar, including serving as the secretary of the Board of Trustees and establishing an annual Golf Tournament to benefit the Taxin Research Fund. Thanks to her efforts, the Fund received more than \$6 million in charitable gifts since its inception and has enabled Wistar to recruit expert scientists in this field and pursue innovative research in the search to uncover new methods to diagnose, treat, and cure brain cancer.

Doris passed away on January 31 of this year at the age of 79. The Wistar Institute is forever indebted to Doris for her personal philanthropy, spirit of volunteerism, and determination in helping us further the research into therapies that could treat this deadly form of cancer so that one day, families like the Taxins won’t experience a loss like theirs.

**Wistar is proud to continue the legacy that Doris started.** Today, through the efforts of scientists like our newest recruit, Filippo Veglia, Ph.D.; alongside David Weiner, Ph.D.; Dr. Qing Chen, M.D., Ph.D.; and Irene Bertolini, Ph.D., we’re establishing a better understanding of how we can counter glioblastoma. Wistar’s brain cancer research aims to understand its resistance to immunotherapy, identify how cancer cells metastasize to the brain, determine what causes glioblastoma tumor growth, and ultimately develop a therapy to vaccinate against the disease. Funded in part by contributions to the Albert R. Taxin Brain Tumor Research Fund, Wistar will continue its mission to uncover new, innovative ways to diagnose, treat, and cure cancers like glioblastoma. **Learn more about how Wistar scientists are researching methods to fight glioblastoma by scanning this QR code.**



## Give a gift that lasts forever

Endowed gifts provide perpetual support for Wistar’s future.

An endowed gift to The Wistar Institute today secures support for Wistar’s future in perpetuity. When you make a donation to an Endowed Fund, your gift has immediate and long-term benefits.

Endowed Funds are invested, and a portion of the Fund’s annual income, generated from the investment’s growth, is used to address current needs at Wistar. The remaining assets are reinvested to ensure growing support for years to come.

Endowed gifts are particularly special because they provide a source of support for Wistar that will never end, and in doing so, donors establish a meaningful legacy for themselves and their family at the Institute. We proudly recognize our perpetual donors — those making gifts of \$25,000 or more to an Endowed Fund at Wistar — as members of our 1892 Legacy Society.

### Your endowed gift can:

- be made with an immediate donation (e.g. cash, stock, DAF, IRA QCD) or deferred donation (e.g. gift in your will).
- be funded with an outright single donation or a multi-year commitment with pledge installments.
- be directed toward the Institute’s ongoing and priority needs (unrestricted) or you can choose from a selection of existing endowments.

Contact Brittany McCrimmon, Director of Development, at 215.495.6856 or [bmccrimmon@wistar.org](mailto:bmccrimmon@wistar.org) to discuss endowed gifts.



### PERPETUAL GIVING EXAMPLE Endow Your Annual Support!

Longtime Wistar supporters John and Mary have contributed \$1,000 annually to Wistar for decades. They want to make sure The Wistar Institute continues to receive this support in perpetuity, even after they are gone. John and Mary make a \$25,000 donation to Wistar’s Unrestricted Endowed Fund, which is then invested. Each year, a portion of income from the invested gift — similar in size to what they have given annually in the past\*, and likely to grow over time — will be available to support Wistar’s current priority needs. Through this endowed gift, John and Mary’s annual giving will live on in perpetuity.

For more perpetual giving scenarios, contact Brittany McCrimmon at [bmccrimmon@wistar.org](mailto:bmccrimmon@wistar.org).

\*based on a Board-approved spending rule of 4.75%

# Revealing Biology's Hidden Patterns

## WISTAR'S DR. NOAM AUSLANDER ON THE POWER AND POTENTIAL OF MACHINE LEARNING



If you define your problem correctly, and you have enough data, you have the ability to learn something very complex that you cannot see with your eyes.



Noam Auslander, Ph.D., is assistant professor of the Molecular and Cellular Oncogenesis Program at the Ellen and Ronald Caplan Cancer Center. She focuses on developing machine learning methods to understand the factors driving cancer development and to identify patterns that can improve cancer diagnosis and treatment.

### How would you explain the difference between artificial intelligence and machine learning to somebody who is not a scientist?

Artificial intelligence is more of a general term. Any software that imitates the human learning system is artificial intelligence. If you build a robot, and that robot does nothing but respond to your requests, that's artificial intelligence. Machine learning is a field of study contained within artificial intelligence that involves creating sets of algorithms that can be used to learn a particular task, independent of receiving instructions from humans.

### As your field has advanced, how much of that advancement has been a matter of increased computing power versus improved methods?

It's both of those things combined. Increased computing power has allowed algorithms created 15 or 20 years ago to suddenly become very efficient, very good. These older neural networks had architectures that consumed too much computing power at the time, but once we had the processing power, they started to work much better. And then based on that there has been an explosion of new research. The algorithms have evolved even more, making them much, much better.

### What role do you see for machine-learning models in biomedical data analysis and research?

Our models can extract more information and identify more patterns in data than humans could on their own. Right now, people are building models that will do things like predict clinical outcomes, predict biological factors, and understand more about biology. I think that's very promising, because if you define

your problem correctly, and you have enough data, you have the ability to learn something very complex that you cannot see with your eyes. But still, it requires a person who understands the data, understands what they are doing, and understands how to use the model correctly.

### How do you develop models that can be used to generate meaningful insights about real-world data?

We first need to understand the question or problem we're trying to address, and we need to understand the data well enough to represent it correctly in the algorithm. This usually means talking with the clinicians or the biologists to understand what they're trying to do. We also need to understand how we define a good performance. Is the goal to build a test that can be used in the lab or in the clinic? Or are we trying to learn something new in biology? All of these factors go into designing the model.

### What makes some datasets better suited to a machine learning approach than others?

In general, the more data we have, the more amenable it is for these methods, especially if it's good, clean data. But there are also scenarios where you can take a model that's been trained for one thing, and apply it to another task. A good example is imaging data, like radiology. You can take a pre-trained model for imaging that has already looked at a lot of data. And instead of training the entire architecture, you can train a part of it to only recognize the specific thing you are trying to recognize. You're using technology that has already learned from other problems that you had much more data for, and this makes it much, much easier. | CONTINUED

**What’s the biggest frustration you encounter when developing and training models?**

It’s almost always not enough data. That can lead to overfitting, which means the model stays too close to the training dataset and can’t begin to generalize and make the predictions that allow it to work independently. Or sometimes the data is too complex, we can’t trust it, it’s not annotated correctly, or there are clinical variables that are notated differently by different clinicians. Those kinds of things make it very difficult for us.



**How do you keep up with all the changes in your field?**

The area of machine learning is moving very fast, so we have to keep track of a lot of literature and a lot of new technology. It’s impossible to follow everything that happened even in the last year — if you’re two to five years behind, that’s pretty good. At the same time, it’s a very interdisciplinary field, so for every project we do, we have to keep up with the research in at least two different disciplines. So in a way, we are keeping up with at least twice as much as what normal researchers do.

**What do you think is the most fun or interesting thing about what you do?**

It’s always fun and interesting to work in an area that’s changing so fast — you can be the first to do a lot of things.

*If you think of an important problem or question, you can be the person to address it. And because there is so much data being generated, we can make real biological discoveries, find out completely new things, without relying on a lab. We can use data that’s already out there, and find out something that’s completely new.*

**The type of work you do requires a lot of creativity and problem solving. When you feel stuck on a problem, how do you get your creativity flowing again to look at the problem in a new way?**

When I get stuck on a problem, like part of an algorithm not working, I leave it for a while. I’m a runner, so sometimes I’ll go for a run, and while I’m running I’ll have better ideas come to me. I think it’s always good to stop looking at the problem. Leave it for a while, then come back and take a fresh look.



**Unique Stephens:  
My Journey to a  
Career in Life Science**

Unique Stephens, who recently testified at a Philadelphia City Council hearing about the life science sector, shares why her experience at Wistar was transformational.

**Can you tell me a little bit about your high school experiences? Did you always have an interest in science?**

I really didn’t take a science course until high school. I went to high school in West Philly, and wasn’t interested in science, but my school had a program called a CTE — career and technical education. They offered two different courses: a health-related technology (HRT) program and a sports therapy program. I was enrolled in

the HRT program. It was supposed to be a four-year program that ran from 9th to 12th grade, but I started in 11th grade, so it ran on a compressed timeframe.

This was the first science-related, hands-on course that I took. And it wasn’t even in a traditional science like biology or microbiology — it was focused on nursing. During our training we had a conversation about cancer, and I went down a rabbit hole.

| CONTINUED



I started thinking, “All you have to do is kill the cancer cells. Why is it so hard?” So that was what got me interested in the sciences.

*When I started thinking about a future career, I was initially more attracted to engineering or architecture because I love learning about the structures of things. But in my classes, when we talked about the human body — internal organs and cells — I realized the body is like the most complex structure.*

COVID hit in my senior year of high school, and I was comfortable with receiving the necessary vaccines and booster shots. But a lot of

people in my community were more reluctant because they didn’t understand the science behind it. That heightened my science interest more. If I understood the science, I would be able to break it down so that they wouldn’t have to be too scared to protect themselves.

**You’re currently a senior at Cheyney University. How did you get involved with Wistar?**

I’m studying biology with a concentration in pre-health profession. When I was a junior and registering for courses at Cheyney, I noticed a class called Biomedical Research Methods at Wistar. My advisor suggested I take it because of how important it is to get hands-on lab experience – and this is central to the course. After completing the course, I continued on with a summer

internship at Wistar working under Dr. Ian Tietjen, a Wistar researcher in Dr. Luis Montaner’s lab.

Dr. Tietjen and I talked about continuing my work in the lab because I liked it so much. Then, a couple of weeks into first semester of my senior year, he emailed to say they would very much like to have me back. I was able to continue my work in the lab, and as I got closer to graduation, Dr. Tietjen asked about my plans afterwards. I originally considered a gap year but knew this was a great opportunity to continue in the lab through Wistar’s Biomedical Research Technician Apprenticeship. I qualified for the apprenticeship because of my coursework, so now I’m working in the Montaner lab for the foreseeable future.

**What does your family think of your path?**

Everybody in my family loves the work that I do. My older sister was also in research, but it wasn’t as focused as what I do. They recognize that I’ve always been very “hands on” and had a tendency to question everything, so research is a good fit. I think they admire the work I do because it’s so different. I break the science down for my dad and he catches

on quickly. But what’s also interesting is that he gives me ideas regarding my research experiments.

**What does diversity, equity, and inclusion mean to you, and why is it important?**

As you see more diverse people around you — people who look like you — it makes you feel like you can belong in this space. It gives you the confidence that even if you feel like you don’t know what you’re doing, you can always learn. Diversity covers so many different forms — you can get input from the most unlikely places! Let’s take my dad, for instance, the reason I talk to my dad and my friends about the work that I do is even if they don’t understand the science, they still have good ideas about the questions to ask when doing science. My dad has no science background, but he has common sense and brings an outside perspective.

I think that representation and feeling comfortable all really matters, and it moves everything forward.

**You mentioned you want to go to grad school. Do you see yourself as continuing in the research field or do you think you may end up teaching?**

I would like to do both. I’m really interested in education. For the last two years, I’ve been tutoring high-school students in biology, chemistry, and even math. It’s inspiring to see my students learning about different chemicals and bonds and basic biology. I believe you can learn whatever you want, you just need a good teacher to help you understand. It’s definitely something that I would love to do. I love research, but I think teaching would be very fulfilling alongside carrying out straight research.

**You recently testified before Philadelphia City Council, at a hearing about training for future life science careers. What was that experience like?**

I was anxious — as you can imagine — but it was great. If I did it again, I would be more confident. When I know what I’m speaking about, and I stick to my experiences, and in my own words, then I’m confident. I didn’t practice my testimony beforehand, but next time I will so that I can feel comfortable. It was a great experience — I loved it. And I tell everybody I spoke at City Council!

**Any outside interests or hobbies?**

Most of my hobbies are on hold because of classes and work, but I’ve been planning! Once I graduate, so much time is going to be freed up. I’m learning how to roller skate because all my friends know how. I’m practicing in my basement because I’m too embarrassed to go to the actual skating rink and fall. I also like to sew, and I have a sewing room. My grandma taught me how to crochet and knit. I’m also really interested in cooking, even though I’m not very good at it yet. My mom keeps encouraging me, though, so the more I do it the better I’ll get.

**Bold Science // Global Impact**

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Wistar’s Fox Biomedical Research Technician (BRT) Apprenticeship is made possible thanks to an endowed **Bold Science // Global Impact** Campaign gift from Penny Fox, Amy Fox, and Daniel Wheeler. Their transformational support enables Wistar to train apprentices like Unique, preparing them for highly skilled jobs in life science.

For more information on Campaign achievements like this one, visit [boldscience.wistar.org](https://boldscience.wistar.org) or scan this QR code.



**Bold Science // Global Impact**

# Schwartz McDonald Family Gift Creates New Endowed Fund

Sometimes new technology becomes available with relevance to ongoing research but grant funding is already budgeted elsewhere. Without additional funding, the research team may have no access, or delayed access, to technology that could play a critical role in advancing the research.

Thanks to a Bold Science//Global Impact Campaign gift from Susan and Graham McDonald, The Schwartz McDonald Family Talent & Technology Endowed Fund is being established to make new technology more readily available to Wistar’s talented researchers.

“Based on my personal involvement with Wistar over the years, my family has been made aware of how emerging technologies — and the funding needed to access those technologies — can accelerate or potentiate a research project,” says

*“Technology alone won’t make breakthroughs in science. It’s Wistar’s extraordinary scientists and the imaginative ways they put that technology to use which produce meaningful discoveries.”* Susan Schwartz McDonald

Susan Schwartz McDonald, a longtime supporter and Wistar Trustee. “We wanted to create a funding mechanism to ensure that Wistar scientists have another resource they can turn to if grants or other funding sources fall short of covering the cost for new, more advanced technology.”

The Schwartz McDonald family was very intentional in naming the Endowed Fund, ensuring both “Talent” and “Technology” were used. “Technology alone won’t make breakthroughs in science. It’s Wistar’s extraordinary scientists and the imaginative ways

they put technology to use that produce meaningful discoveries.”

The Talent & Technology Fund will also serve as a source of support for technological acquisitions for Wistar’s shared resources — technology and expertise that are available to scientists internally and externally.

This marks the first time the family has contributed an endowed gift to Wistar, and the Bold Science//Global Impact Campaign presented an ideal opportunity to support a Wistar need and create a meaningful family legacy with deep personal

roots for Susan. Her introduction to Wistar as a young journalist asked to write an article about the Institute sparked a lasting enthusiasm and years of support that ultimately led to a position on the Board. “There’s a sense of

permanence to this gift and a deep satisfaction, knowing it will help advance Wistar science well beyond our lifetime and the lives of our children and grandchildren. It’s a resource we wanted to create now with the intention

of building on this legacy over time. We hope our initial gift will inspire others to contribute to the endowment and grow this important resource for Wistar beyond what our family could do alone.”

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## Helen Dean King Award Ceremony honoring Katalin Karikó, Ph.D.

Each year, Wistar presents the Helen Dean King Award to an inspiring and prestigious scholar. This year, we honor Dr. Katalin Karikó, professor at the University of Szeged in Hungary and an adjunct professor at the University of Pennsylvania. In 2023 she received the Nobel Prize in Medicine for her work on mRNA therapies. Her research made mRNA safe, effective, and practical for use as a vaccine against COVID-19. Join us in person or virtually for her presentation, **“My Journey to Develop mRNA for Therapy.”** Seating is limited. Watch for updates to register online in August. For more information, please email [comm-marketing@wistar.org](mailto:comm-marketing@wistar.org).



### Wistar Society Members — Join Us!

Wistar is excited to offer members of our President’s Society and 1892 Legacy Society access to an exclusive opportunity to hear from 2023 Nobel Laureate Dr. Katalin Karikó following the Helen Dean King Award ceremony. Save the date for the afternoon of Tuesday, October 8, 2024. Formal invitation to follow. For more information on how you can join us for this special event, email [development@wistar.org](mailto:development@wistar.org).

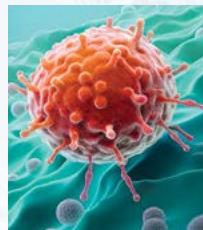


# Join us in being a part of Wistar's impact on the world

Supporting The Wistar Institute is an investment in the future. It is about the promise and the hope for things that are not yet here. With your involvement, Wistar will have more freedom to make tomorrow's discoveries and more bandwidth to nurture the next generation of talent in life science.

Your contribution can be designated to align with the difference you seek to make in the world through your giving. Here are some ideas for your consideration:

## Ellen and Ronald Caplan Cancer Center Fund



Wistar's Cancer Center is the nation's first National Cancer Institute (NCI)-designated Cancer Center for basic research and one of only seven such institutes in the country today. Known for its significant advances in cancer genetics, biology, immunology, and virology, the Caplan Cancer Center contributes to improved cancer treatments and diagnostic tests. Your gift will support our ongoing efforts to more effectively identify, treat, prevent, and cure cancer.

## Vaccine & Immunotherapy Center Fund



Wistar's Vaccine & Immunotherapy research focuses on immunology, virology, and immuno-oncology to improve world public health through the creation of new and improved interventions and treatments for some of the most dangerous and widespread infectious diseases and cancers caused by viruses and microorganisms. Your gift will help our researchers advance their work in developing new and improved vaccines and immunotherapies.

## Hubert J. P. Schoemaker Education & Training Center Fund



Wistar's educational initiatives range from high school through undergraduate, graduate, and postdoctoral degree levels. Our workforce development programs include registered pre-apprenticeships and apprenticeships tailored toward students of two- and four-year colleges as well as adults living and learning in Philadelphia. Your gift will support and expand these career-transforming programs, which foster a highly skilled, diverse talent pipeline in life science.

## Wistar Unrestricted Fund

Unrestricted gifts to Wistar give the Institute the flexibility to apply your support where it is needed most.

*“Wistar Education & Training’s focus on innovative, research-based best practices is why I value working with Wistar as a central partner to our Life Science Pathway work. Since I first came across Kristy and her team’s work, I’ve observed that most if not all high-impact life science education and training projects in Philly go through Wistar in one way or another.”*

Jeremy Heyman, Ph.D., Director,  
STEM Pathways at Heights Philadelphia



Support research and programs highlighted in this issue:

The **Bold Science** // **Global Impact** Campaign for Wistar  
»»Pages 8 and 21

The Schwartz McDonald Talent & Technology Endowed Fund  
»»Page 22

The Albert R. Taxin Brain Tumor Research Fund  
»»Page 14



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A Cancer Center Designated by the National Cancer Institute

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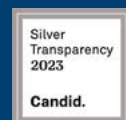
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