



Northwestern | RESEARCH **FACULTY EXCELLENCE**



2017-2018



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Jay Walsh

Vice President for Research

Matt Golosinski

Director of Research Communications, Writer

Jeanine Shimer

Designer

Northwestern University

Office for Research

1801 Maple Street, #5313

Evanston, Illinois 60208

research.northwestern.edu

facebook.com/NorthwesternResearch

twitter.com/researchNU

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On the cover, clockwise from top left: Maciej “Matt” Lesniak, neurological surgery; Leslie Harris, history; Lisa Corrin, art history; Harry Kraemer, Jr., strategy and leadership at the Kellogg; Amanda Saratsis, neurological surgery; Phil Hockberger, physiology, and associate vice president for research.

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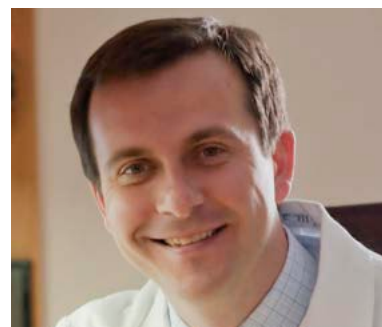
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ESSAYIST AND ‘SPY’ EULA BISS GOES LOOKING FOR TROUBLE

Eula Biss is careful with her words. She’s also fearless in harnessing language’s revelatory power to produce evocative essays that meld poetry, nonfiction, and myth.

The celebrated writer interrogates language, getting it to reveal its secrets as she explores complex subjects like race, relationships, identity, or the immune system. *The Balloonists*, her quasi-autobiographical 2002 debut, creates a spare yet arresting expressionistic portrait of a family under pressure:

My mother was in the bathtub crying and I was standing outside the door waiting, just in case she decided to slip her head under and keep it there. The other kids were upstairs. The problem was about money, of course. She was afraid she wouldn’t have enough for us to eat.

Biss, professor of instruction in Northwestern’s Department of English where she teaches creative nonfiction, doesn’t let even familiar terms off the hook: “privilege,” she reminds us in the recent “White Debt,” a meditation on race, derives from Latin words for private and law,

and so “describes a legal system in which not everyone is equally bound.” Less thoughtful authors might stride blindly over that foundation, and so render invisible a nuance that, instead, is central to an urgent social discussion.

But Biss never has retreated from challenging topics. Her 2009 collection, *Notes from No Man’s Land*, examined institutional racism and won the National Book Critics Circle Award for Criticism and the Graywolf Press Nonfiction Prize. She’s also turned personal challenge into art. *On Immunity: An Inoculation*, her heralded 2014 book, offers a deeply researched excursion into medical science and owes its origins to the traumatic birth of her son. The delivery resulted in emergency surgery, which included blood transfusions and an intervention whose physicality impressed upon Biss the interdependency of bodies: individual bodies, the body politic, and a body of knowledge — in this case, immunology.

The complex labor also set her on a fearful journey, one that transformed from a “sunlit moment” along Lake

Michigan into a life-and-death struggle: “I imagined myself swimming in the lake, which became, against my will, a lake of darkness and then a lake of fire and then a lake without a horizon,” she writes in *On Immunity*. Such reflections led to conversations with other mothers about childrearing issues, including vaccinations and those profound apprehensions that can grip new parents. (The book also includes detours into vampires and Voltaire, whose *Candide* served as a partial touchstone.)

Throughout the text, the immune system functions as a lens through which Biss articulates humanity’s deep connection. “No single human has the genetic material to fight every disease, but collectively we’re genetically diverse enough that humans as a whole can’t be wiped out by one disease,” she has said. “A single body can’t stand alone against disease, but a collective body can. That, to me, is a beautiful metaphor.”

Though Biss has no formal science training — she earned her MFA in nonfiction from University of Iowa in 2006 before joining Northwestern’s

Weinberg College as an Artist in Residence — she spent several years interviewing medical experts and reading about immunology — including an undergraduate textbook in the subject. “It turns out the immune system is the most complicated system in the body,” Biss says. “I’d be better off trying to understand neuroscience than immunology.

Still, by persevering and immersing herself into the topic, Biss modeled the advice that she offers her students: Try not to bore yourself. Her methods work: *On Immunity* earned distinction on numerous “Best Of” lists and was a finalist for the National Book Critics Circle Award.

Biss isn’t exactly sure about the source of her writing’s moral sensibility. It may partly derive from her physician father’s “deep humility” and almost “Catholic” approach to his profession, or else her mother’s maverick commitment to making art and her love of recounting myths that, when unpacked, yield life-enriching principles. (The myths of Achilles and Narcissus frame *On Immunity*.) Regardless, each of her three younger siblings shares this sensibility: “My sister is a philosopher with an interest in ethics, my brother teaches history and has an interest in racial politics, and my youngest sister, the most practical of us all, is a therapist and a social worker,” says Biss.

Widely published, Biss’ work has appeared in the *Believer*, *Harper’s Magazine*, the *New York Times Magazine*, as well as in respected



Eula Biss, English

literary journals and in anthologies such as *The Best Creative Nonfiction* and *Pushcart Prize*. She has received fellowships from the Guggenheim Foundation, the Howard Foundation, and the National Endowment for the Arts and was selected as one of Crain’s “40 Under 40” in 2015. She and her spouse, John Bresland, English, founded a conceptual band, STET Everything, which has yet to produce any music. *Research News* interviewed Biss about her work, which includes being what she calls a “spy, a smuggler, and a translator.”

Your writing has an elevating beauty that’s both resilient and, perhaps, at times delicate. It’s been likened to “spare Japanese brushstrokes.” These qualities

seem at odds with our bombastic, “post-fact” national discourse, so much of which traffics in fear. In *On Immunity* you’ve written that “our fears are dear to us.” Has our vocabulary grown increasingly “dreadful,” and with what consequences?

Every time I teach George Orwell’s 1946 essay, “Politics and the English Language,” which is nearly every quarter, it feels newly relevant to me. On the first page of that essay he writes: “A man may take to drink because he feels himself to be a failure, and then fail all the more completely because he drinks. It is rather the same thing that is happening to the English language. It becomes ugly and inaccurate because

our thoughts are foolish, but the slovenliness of our language makes it easier for us to have foolish thoughts.” Orwell is particularly lucid on the reciprocal relationship between thought and language, and his essay is a reminder that political language has long relied on imprecision to hide the realities of political action. But it is political action, not the language that obscures it, that is the true threat.

Can we use language to refine our thinking and save us from ourselves?

I’m currently engaged in a long, ongoing debate with myself about the limits of language. Sometimes that debate spills over into conversations with other writers, like Maggie Nelson, who once said to me, “Saying is doing.” I haven’t concluded my debate with myself or Maggie, but I do know that one of the hazards of loving language, as I do, is that you can come to believe that language has a power it does not actually possess. I once had a difficult conversation with some students about the n-word.

When one of the students said, “That word lynched people,” I had to pause the conversation to clarify that, no, that word did not lynch people. People lynched people. And a lynching can happen without anyone ever saying the n-word. That doesn’t mean words don’t matter, or that language can’t be damaging, but I think we have to be careful not to give language the attention that action deserves.

***On Immunity* advances a view about our “shared physicality.” Yet, our national discourse, including advertisements and public policy, often encourage us to dream ourselves unique and apart from the Other. How do you regard these seeming contraries?**

I don’t think there is a contradiction there. I think we can understand ourselves as unique individuals who are both independent and interdependent if we let go of the assumption that those concepts are in opposition to each other. One of the ideas that I was pursuing in *On Immunity* was the possibility that

there is no clear division between self and other. All of us are both. Immunology is heavily dependent on the concept of “self” and “other,” but any immunologist will tell you that our bodies consist of more cells that are classified as “other” than cells that are classified as “self.” And we can’t live without that other stuff that’s in us. Self and other are just as tricky when it comes to citizenship. Think of the “dreamers,” for example — people who were brought to this country as illegal immigrants at a very young age. They may not technically be citizens, but they have grown up here, they have been educated here, and in many cases this country is the only home they remember. Are they self or other? I’d say they’re both, just as most of us are.

The narrative of privilege, including white privilege, is one that you’ve explored in your work. What attracted you to this subject and why do you believe it so important?

Being someone who looks white has made me interested in thinking about

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One of the hazards of loving language, as I do, is that you can come to believe that language has a power it does not actually possess. We have to be careful not to give language the attention that action deserves. Eula Biss

whiteness and what my whiteness means to the people around me. Because of the religious community my family belonged to when I was a teenager, and because of the neighborhoods where I lived in New York City in my early twenties, and because of my short stint as a reporter for an African American community newspaper in San Diego, I've been in a number of situations where my whiteness was remarkable. You don't need to spend time as the only white person in the room to think about whiteness, but being the only white person in the room can certainly serve as an invitation to reflection. For much of my early adulthood, my whiteness was not invisible or comfortable, and I couldn't avoid thinking about it. As Toni Morrison has observed, whiteness confuses nobody so much as it confuses white people. In my work, I often write from confusion, from uncertainty, and from trouble. The subject of whiteness is so full of trouble that I find myself drawn back to it again and again.

You also remind us that power is embedded in privilege — a word that means “private law” — and that the law doesn’t necessarily mean the same thing depending on one’s socioeconomic and racial background.

There's an inherent injustice there. But I sometimes wonder, when I hear the word “privilege,” if that's really the right word for the problem we're trying to talk about. In her book *Negroland*, Margo Jefferson writes: “Privilege is provisional. Privilege can be denied, withheld, offered grudgingly and summarily

withdrawn. Entitlement is impervious to the kinds of verbs that modify privilege.” So, perhaps “entitlement” is the word we want. John Bresland, my colleague in creative writing, doesn't use the term “privilege.” He prefers the term “power,” particularly when talking about whiteness. “White power” is, I think, a more discomfiting term. And it can be more revealing. As a woman who, into my middle age, has often been perceived as younger than I am and is often treated like a little girl, I have an enduring interest in both power and authority. Like whiteness, power and authority are full of trouble, and my writing has offered me some wonderfully complicated opportunities to both use and refuse power and authority.

As a faculty member at a prestigious university, are you ever concerned about succumbing to your own species of privilege? How do you safeguard against this?

My position here is a tremendous luxury, particularly for an artist. I grew up believing that an artist couldn't have the kind of life I have. I still don't quite believe it. And yes, I have some persistent questions about what I'm doing in the University, and what the University might be doing to me. “The University and the Undercommons,” an essay by Stefano Harney and Fred Moten, has provided me with some valuable guidance in facing these questions. I try to follow their injunction to “be in but not of” the university.

In his review of my most recent book, Dwight Garner called me a “class spy.” I like that term, and I've come to understand my role in the University

variously as a spy, a smuggler, and a translator. Over the course of my career as a writer, I've engaged more and more with the scholarship around me here, and that engagement has led to quite a bit of time spent translating English to English. I love all the great thinking I've found within the University, and I've worked hard to smuggle some of that thinking out of the University through my writing.

What early experiences shaped your interest in writing?

Working with young writers who are hungry for permission to pursue their art has made me acutely aware of how lucky I have been in that regard. My mother gave me what I now understand is the very rare impression that the most important thing I could do with my life was to make art. When I was young, my mother wrote poetry and edited a literary magazine. She went on to work in other mediums, and she ultimately dropped out of the middle class to work as an artist. Her bookshelf is where I found some of the first books that really moved me. I still have the worn copy of William Carlos Williams's *Pictures from Brueghel* that I took from my mother's bookshelf when I was 12, and his “Song” remains one of the only poems I know by heart.

BOYLE'S SEARCH FOR JUSTICE

Racial conflict rooted in the everyday for civil rights scholar

The 1960s were a crucible for profound, often turbulent, social change in America. Issues of economic and racial justice played out in the halls of government — and in the streets of cities like Watts, Newark, Chicago, and Washington, DC. The backdrop for one of the decade's deadliest episodes of urban unrest was Detroit; it was there in 1967 that 43 people died over the course of a five-day conflict sparked by an after-hours police raid of an unlicensed bar.

Kevin Boyle, history, grew up in Detroit in the midst of these social transformations, and the battleground where class, race, and politics intersect is home to his award-winning scholarship. Throughout four books and dozens of articles and reviews, he has produced important new insights on America's labor and civil rights movements. Boyle's *The Arc of Justice*, a deeply researched nonfiction account of a sensational murder trial in 1925 Detroit, highlights how racial violence played out in a seminal legal case. This project earned the 2004 National Book Award among many other honors.

Boyle's work depicts history through the lives of everyday people. "To a huge extent, my career has been dedicated to learning about the horrific power of race, the origins of racial division, and how these played

out for ordinary people," he says.

At Northwestern, Boyle is the William Smith Mason Professor of American History, and teaches undergraduate courses on modern US history, social movements, and racial violence. He has held fellowships from the Rockefeller Foundation, the Fulbright Foundation, the American Council of Learned Societies, the National Endowment for the Humanities, and the John Simon Guggenheim Foundation. He is currently on a fellowship from the Carnegie Corporation and writing a new book, *The Splendid Dead: An American Ordeal*, which is about political extremism. *Research News* spoke with Professor Boyle about how his own history has shaped his academic pursuits.

You were born in 1960 and so were a child during a time when America was undergoing massive social change. How did these experiences impact you?

The racial divisions were so deep in Detroit, but I certainly didn't have any active participation in the 1960s social movements, which is one way that a lot of historians came to that topic. I was more influenced by the fallout after the 1960s — the wrenching economic changes that swept through Detroit, which led to my interest in the labor movement.

In many ways, American society underwent this profound social transformation in the 1970s, when the post-war order collapsed. This was a formative experience for me and for my scholarship.

Was anyone around you directly involved in protest movements?

No, I wasn't surrounded by activists. I was surrounded by ordinary people, and I don't mean that in a pejorative sense. These people were grappling with huge changes that they couldn't control. This context really influenced how I approach history. One way you can do social movement history is by valorizing activism. This can streamline matters. But another way, which I tend to favor, is to complicate things.

In my work, I emphasize the multiple ways in which people experience social change — sometimes in really honorable ways, sometimes in less-than-honorable ways. I want to get down to the most basic experience of people struggling with profound change.

In depicting that struggle, invariably you are going to encounter those who are on the "wrong side of history." Yet, your work doesn't consign these people to mere caricatures.

That's right. Even in those cases, we want to understand these people. Not

always to excuse what they do, but to understand them. Just as you don't want to turn everyone in a social movement into a hero, you also don't want to demonize everyone who opposes a movement. You want to make all of them human. Yet, what often happens in historical research is we tend to reduce people to social categories. They become stand-ins for "women" or "workers." I want to make our history more complicated than that by telling the stories of real people, not allegorical figures.

Today's headlines suggest that America has a way to go to ameliorate economic and racial injustice. How do you see things?

While working on *The Arc of Justice*, I knew, intellectually, the depth of violence that African Americans faced in the early 20th century. I had read books on lynching. Yet,

I wasn't prepared to face the immediacy of it that my research brought forward. We were a society that was extraordinarily violent toward African Americans, a society where racism of the most blatant kind was perfectly acceptable and something that you proudly embraced! Lynchings were horrific spectacles fueled by sadistic violence — ritualistic bloodlust, there's no other way to describe it. I can't emphasize enough how far we've come from those times. We're not that society anymore. Our progress happened because a lot of ordinary people did some extraordinarily brave things to demand that things get better.

The problem is, many white Americans say that because we've made strides, everything has been

solved. To them, the problems of race in America are residual. That's not the situation in the United States. We remain a profoundly segregated society, and that's not to deny the progress we've made.

On the economic front, I'm not optimistic at all. Over the last 30 years, America has become such a profoundly unequal society. There's a level of economic inequality that is truly staggering.

As a historian, you've reflected on the choices, challenges, and circumstances of others. How has this helped you gain insight into your own history?

My career has helped me contextualize my family's experience in a broader framework. You realize that you're not anomalous. Your family's experience is part of huge trends in our society. My parents were Irish immigrants and so my scholarship has helped me understand better the dynamics that drove immigration and policies — the factors that made me an American.

Is there a piece of that personal history that stands out for you today?

My scholarship deals with complex relationships between individual action and large institutional structures. One thing that personally illustrates this dynamic is the experience of my family, my community, undergoing "white flight" in the 1970s — moving out of the city into homogenous communities. This was linked to issues of race and economics in the real estate market. Most of the adults in my neighborhood were not racists; by and large, they were good, honest



Kevin Boyle, history

people who suddenly felt like they had to act on racist ideas because these were tied up with other forces. This was my home, a tight-knit community. All of a sudden, the horrible problem of race comes along and, within a year, shattered that entire structure. African Americans had nothing to do with this white flight. We did it to ourselves.

When you're 17, on the cusp of adulthood and looking to the future, what you want to do is leave your world; you don't want your world to leave you. But that world of mine, which had grounded me for so many years, was gone. And it was gone because of what we as a nation did — and do — to ourselves.

ART THAT SEES THE BIG PICTURE

Block Museum Director Lisa Corrin explores visual language to help drive interdisciplinary research at Northwestern

The Block Museum of Art occupies a modest physical location on Northwestern's Evanston campus, but it exerts an outsized impact on the University's academic and cultural life, says its director, **Lisa Graziose Corrin**. And that influence is growing.

"We're small but mighty. We are a window to the University's diverse brain trust — our faculty and students," says Corrin, an award-winning scholar who joined Northwestern in 2012, after more than three decades in curatorial leadership at various cultural institutions. Throughout her illustrious career, she has radically reimaged the museum. In doing so, she has helped create spaces for art that encourage people to ask urgent questions about history and the world, while also providing a place for reflection and learning that connect campus and surrounding communities.

"Art and creativity operate at the intersection of many fields," Corrin says. "This 'and/and' synthesis is at the heart of Northwestern's academic culture, where students can pursue multiple majors in different schools and bring them together in unique ways. The Block's model, similarly, reflects this ambition. Virtually

everything we do has involved faculty and students as researchers, as curators, as part of our programs."

It's not surprising, then, that Corrin and her team have been transforming the 37-year-old Block into a dynamic teaching and research hub that spurs interdisciplinary conversations through innovative art exhibitions, lectures, and workshops. Corrin says that the creative process isn't confined to an artist's studio. Because it involves experimentation and trial and error, that process is at the heart of science and entrepreneurship, too. It's a process that can help engineers and others more fully embrace iterative practice.

In fact, the Block has partnered with the McCormick School of Engineering on a series of art and engineering lectures, bringing to campus renowned artists such as Pedro Reyes, who was profiled on the PBS series "Art 21," and a "citizen-scientist" Dario Robleto, an artist featured in the Block's "If You Remember, I'll Remember" exhibition. Corrin also is exploring opportunities for the museum to catalyze future initiatives at The Garage and the Kellogg School of Management. The Block routinely collaborates with Northwestern University Libraries, an arrangement

that proved integral to the success of last year's critically acclaimed retrospective on avant-garde artist Charlotte Moorman, an underappreciated but influential cellist, performance artist, and curator whose extensive archives are located at Northwestern. The exhibition traveled internationally and was named by *New York Times* art critic, Holland Cotter, one of the nation's top 10 exhibitions for the year.

Art Unbound

Such ambitions align well with Corrin's professional experiences and her early love of art history. She grew up on Long Island in an Italian-American family whose vacations often involved visits to historical sites, like Colonial Williamsburg, Plymouth Rock, or else cultural institutions — including the Metropolitan Museum of Art in New York, where her father began his career photographing art, including the restoration of The Cloisters. Her father, Patrick J. Graziose, who died last year, opened his portrait studio, Gray Studios, in Floral Park, New York, the day his daughter was born, but took the family to the Met where he taught Corrin how to visually analyze art. Corrin says she still considers the Met like home.

“As a teenager, art works that I saw at the Met were windows through which I found views on to other modes of experience,” she recalls. “Art teaches us that we are not bounded by where and how we grew up, or the values we have internalized. It teaches us to ask questions and it challenges our assumptions.”

It was a 10th-grade European history course in which she was asked to research French Impressionism that started it all for Corrin. During her class presentation about her research, she discovered that her eyes were the chief means by which she made sense of her environment.

“I am an intensely visual person,” she says. “This experience taught me the power of images in constructing how we understand our world. I was young. I didn’t even know what a curator was, but I knew I had found my passion.”

It wasn’t until later, though, that Corrin knew she was going to be “a museum person.” A first-generation college graduate, she went to Virginia’s Mary Washington College as a Regional Scholar and, with the support of the Grellet Simpson Memorial Scholarship from its alumni association, attended the University College in London. Many of her classes took place in the National Gallery, the Tate, and the Whitechapel Art Gallery. In 1997, she returned to London as chief curator at the Serpentine Gallery, one of Europe’s premiere institutions exhibiting contemporary art.

“My mother, a voracious reader, loved history and read me poetry from a young age. My father introduced me

to his love of art and music. On many Sundays, we would gather as a lively extended family, eat Italian feasts, and then my dad would bring out his accordion and we would sing along. My memories of history, reading, art, and music provided the backdrop for what became my predisposition towards art forms that combine disciplines.”

Visual Language Matters

That interdisciplinary work infuses the Block’s vision. Corrin is a proponent of art’s intrinsic merits — art for art’s sake — but she also says that global art offers a springboard for thinking about ideas and issues that matter today. Engagement programs at the Block focus on art as a lived experience. She also thinks that it is important for students to learn how to “read” the world of images critically and that a keen sense of how images operate is vital

even for those who rarely set foot inside a museum.

“The visual is a language,” Corrin says. “We teach our students how to analyze images for the messages they send. When we look at images of a political rally in the newspaper or on TV, every element has been calculated to convey a specific ideological message. That reality is a construction that is carefully composed, edited, framed. This is as true in mass culture as it is in art.”

Art’s critical lens can also be turned on the museum space itself. This first happened early in Corrin’s career when she was a curator at Baltimore’s Contemporary Museum, a “nomadic,” museum without walls founded in 1989 by George Ciscle, a mentor to Corrin. The two wanted to break down the assumptions that people had about art, artists, and museums and to change the ways in which

Lisa Corrin, art history; director Block Museum



We're small but mighty. We are a window to the University's diverse brain trust — our faculty and students.

Lisa Graziose Corrin, director, Block Museum

audiences experienced art. They did this by working directly with communities on projects, and sometimes these projects involved sequestering other museums.

Their most recognized project took place in 1992 — a partnership among artist Fred Wilson, The Contemporary, and the Maryland Historical Society, a distinguished institution whose holdings told the story of that state's "great white families," but without any reference to its long history of slavery. Absent, too, was the presence of prominent African Americans, such as Harriet Tubman, Frederick Douglass, or the astronomer Benjamin Banneker, all of whom lived in or significantly impacted Maryland history.

Wilson's installation asked, "Whose history is being told by the Maryland Historical Society?" The question held special relevance for holdings that showcased objects reflecting the collecting tastes and interests of an antebellum-era gentleman: ornate silver, carved furniture, portrait paintings, ship models, genealogical tables, and duck decoys.

Life-Changing Art

Fred Wilson's groundbreaking installation, "Mining the Museum," set out to redress this balance, by figuratively shaking the Historical

Society's holdings until they revealed a hidden history in friction with its dominant narrative.

Working with the Society's collection, Wilson juxtaposed objects in new ways to unveil the complex truth within them. A display of silver wine goblets appeared in a display case with a pair of slave shackles and was labeled "Metalwork, 1723-1880" to demonstrate how, according to Corrin's canonical essay in the book about the project, "museum classification, by hygienically separating history into clean compartments, creates a tidy structure of institutional denial." Wilson's display pointed out that we can look at the lavishly decorated goblet from the point of view of the wealthy family who owned it or from the perspective of the enslaved individual who poured the wine into it.

Another dramatic display, "Modes of Transport," combined a model of a slave ship with its inventory of human cargo, a sedan chair, and an antique baby carriage. However, the carriage had acquired a disturbing passenger — a Ku Klux Klan hood.

In "Cabinetmaking, 1820-1960," Wilson arranged period chairs like spectators around an authentic whipping post used to punish slaves

and, later, outside the Baltimore City Jail, African American prisoners. The tableau chillingly foregrounded the complicity that enabled institutional bondage and brutality to flourish. Fred Wilson would go on to win a MacArthur Foundation "genius grant" in 1999, and "Mining the Museum" is considered a landmark among 20th-century exhibitions. The associated monograph edited by Corrin also received accolades.

"Fred Wilson's art changed that way I saw myself, my role in museums, and my ethical responsibility to history," says Corrin. "Fred's work made me think very hard about 'difference' and made me intensely aware of the privilege I hold in this society as a white person charged with representing others in an institution in the public trust. It also taught me how museums shape knowledge and act as purveyors of cultural values. It is my responsibility to ensure that the Block is aware and humbled by this position of power, that we use our platform to present diverse perspectives, and that we honor creativity in its many voices and forms across cultures and time."

Working with Wilson and Ciscle would influence Corrin in her subsequent tenures at the Serpentine Gallery in London from 1997-2011, at the Seattle Art Museum, at the

Williams College Museum of Art, and today at the Block. She cites the Block's 2015 exhibition "Collecting Paradise: Buddhist Art of Kashmir and Its Legacies" as a significant example of how the Block has considered collecting art from non-western and non-European cultures and how the context of the museum, a western invention, transforms their meaning. The exhibition was curated by Northwestern art history professor Rob Linrothe, with a team from the Block led by its associate director of curatorial affairs, Kathleen Berzock, an African art expert.

"The exhibition had extraordinary loans from major museums like the Cleveland Museum of Art and the Los Angeles County Museum of Art. The kinds of questions it raised were ideally suited to a university art museum," says Corrin. "One aspect of the exhibition was to consider how these objects got from Kashmir to museums via Tibetologists and scientists who, with the best of intentions, believed that in the interest of furthering knowledge it was acceptable to remove these objects from a sacred site, such as a temple, and put them into another 'temple'—the museum."

Exploring 'Multiple Histories'

At the University, the Block works in an environment in which critical inquiry in the interest of teaching and learning is the primary mission. Exhibitions at the Block like Collecting Paradise promote innovative scholarship and also ask big, bold questions.

Says Corrin: "We offer a different texture than other museums. We showcase art, yes, but the way we do this allows us to explore complex questions and multiple histories that exist in simultaneity, rather than to try to cancel one history out in favor of another."

That's something the Block did in the Charlotte Moorman exhibition, A Feast of Astonishments, says Corrin. "Here was a woman who was almost entirely left out of art history because she did not fit the categories that shaped the stories it told in her time. She was an individual whose creativity was multifaceted and resistant to classification. That was the point for her and other experimental artists in the 1960s and '70s: to be creative, to redefine the very definitions of 'art,' 'music,' 'performance,' to keep them all vital."

Corrin says that the best university museums today are not "trophy halls" that showcase donor generosity in the form of in-kind gifts of art. Like the Block, they are committed to a serious teaching mission. They remain the training grounds for the next generation of curators and art historians, and, in addition, are integral to cross-disciplinary discovery.

"McCormick School Dean Ottino and I often talk about how the most exiting work is being done today in any field is at the intersections of many fields," says Corrin. "Where we find convergence, we find innovation." On Northwestern's Evanston campus, the Block is part of a major recent investment that created the Arts Circle, which

combines the University's excellence in theater, visual arts, music, film, dance, and the literary arts. But the Block's partnerships extend well beyond the arts.

"The Block reflects the DNA of Northwestern and its unique strengths and legacies. It does not stand apart from this great university but is nourished by, and in turn nourishes, Northwestern," says Corrin.

Corrin says that as Northwestern continues to infuse a global perspective across its curriculum, so too, does the Block. The museum's exhibitions, collection, and visiting artists represent a wide diversity of backgrounds and global views.

"We have invited artists from around the world to campus to meet with neuroscientists, robotics experts, engineers, bioethicists, as well as art historians, anthropologists, poets, and music theorists," says Corrin. "We have even collaborated with the Center for Wrongful Conviction at the Pritzker Law School. Many of our faculty are invested in 'the visual' and use our exhibitions, our collection, and our engagement programming to support their teaching. They develop new courses in conjunction with Block exhibitions and their students often curate exhibitions as part of their coursework."

"The potential impact of a campus art museum like the Block is limitless."

FREEDOM'S CHAINS

Slavery scholar Harris examines the stunning contradiction at the heart of American history



Leslie Harris, history.

Northwestern historian **Leslie Harris** started planning her escape to New York City at age 10.

It represented an idealized metropolis for her, a child born in the midst of the landmark Civil Rights legislation of the 1960s and whose omnivorous reading habits transported her into a world that seemed more vibrant, diverse, and culturally rich than her native New Orleans. It would take another decade before she reached the Big Apple, enrolling at Columbia University where she would come to discover the unsettling connections between these seemingly different locales.

Many would consider Harris' hometown the iconic cultural melting pot and a standard bearer for innovations in music and cuisine, but she also saw it as a "surprisingly small community" with provincial attitudes that could be stultifying. Plus, New Orleans harbored a not-so-secret cruel past as one of the nation's major slave ports, a fact that she says always presented a "struggle" for her.

"Today, New Orleans is known for its jazz and food and culture — all these things that erase in the minds of many people the labor and slavery aspects of its past," says Harris, a distinguished scholar who joined Northwestern in 2016 after more than two decades on faculty at Emory University. "The story of slavery is oddly not as well documented in the public space."

Instead, it's the "feel-good aspects" of New Orleans that people most associate with what she terms a "downwardly mobile" city whose residents are largely economically dependent on tourism, a sector vulnerable to disasters such as Hurricane Katrina. In fact, Katrina provides the backdrop for Harris' current book project, one that melds her family history and the city's history — with a focus on African Americans living there over the last two centuries. Exploring the complexities of such histories has

been integral to Harris' academic life.

Her earlier books, notably the 2003 text *In the Shadow of Slavery: African Americans in New York City, 1626-1863*, documents an under-researched history of the black experience in this northern industrial center from colonial days into the antebellum period, providing a groundbreaking complement to scholarship that had more thoroughly examined slavery in the US South before the Civil War. In addition to co-founding and directing Emory's "Transforming Community Project" — an initiative that used history to spur institutional dialogue about diversity and entrenched racial challenges in higher education — Harris contributed research insights to help shape the New York Historical Society's pioneering 2005-06 exhibition, "Slavery in New York," a program that included findings from a 1991 discovery of a huge 18th-century "negro burial ground" in Manhattan just two blocks from city hall and 20 feet below the busy sidewalks.

"For most historians, the big story about African Americans and slavery has been all about the South," says Harris, who earned her doctorate in American history from Stanford. "If they think about African Americans in New York, they usually think about the Harlem Renaissance of the 20th century, and I was really curious about how this community lived in

the city before that time.”

Her initial research focused more on free blacks and the antislavery movement during the antebellum period, a story that included significant attention to class relationships and labor history. Over time, though, she found herself exploring slavery’s role earlier in the nation’s history, discovering its pervasive influence throughout the country. Slavery had always been a backdrop of America’s development, from the early days of the Jamestown settlement in the Colony of Virginia and throughout the lucrative triangular trade that circulated sugar, tobacco, cotton, textiles, and enslaved people among Africa, the Americas, and Europe. Still, the more Harris looked, the more she found other deep-rooted connections between the North and South, including troubling economic relationships that linked New York City with the institution of slavery.

“What was surprising was how important slavery was to New York City early on, how extensive it was,” says Harris.

Many Americans may have an easier time summoning an image of enslaved bodies in the context of southern cotton plantations. Yet, the scholarship of Harris and others —

including historian Ira Berlin, with whom Harris collaborated for the New York Historical Society exhibition — presents a more complicated picture of slavery as a ubiquitous presence and driving force in America’s development from the colonial period on. If farms in the South produced much of the nation’s raw trade materials, the North’s industrial infrastructure processed that material and shipped it abroad from northern ports. Northerners also produced and exchanged goods with the South, including shoes for slaves and even tools for punishing slaves.

Far from being confined to particular geographies, “slavery was everywhere, and was fundamental to everything from the founding to the exploration of the Americas,” says Harris. “It was very much an integrated system, without a hard line between North and South.”

In fact, she says, southerners loved New York and traveled there frequently, considering it one of the North’s “most southern” cities and finding that the locals shared a similar mindset about slavery. The historical record supports the claim. In 1703, some 42 percent of New York City households had slaves, mostly working as domestics. By 1740, about 2,500 people — or 20 percent of the city’s population — were enslaved,

serving as laborers in construction and shipping or as artisans. “African-American labor was vital to everything we have today. It was essential to the nation’s economy, settlements, and very survival,” says Harris.

Of course, enslaved people were bought and sold throughout the South, including New Orleans, from the city center to posh hotel rooms. But northern maritime industry played a key role in the slave trade, too, with ships filling eager ports with human cargo several times a month: among them, Charleston, South Carolina; Baltimore, Maryland; and Savannah, Georgia — the subject of a 2014 book, co-edited by Harris, called *Slavery and Freedom in Savannah*. Elite families, including that of James DeWolf (1764-1837), a US senator from Rhode Island, made fortunes while fueling the slave trade.

‘Slavery is an Old Idea’

“It’s still difficult for people today to fully grasp just how much slavery underpinned the wealth of modern capitalism,” says Harris, who has helped reveal that history in her scholarly work and through projects such as her 2014 collaboration with the Telfair Museum’s Owens-Thomas House in Savannah, Georgia, a historic home that has reinterpreted its educational mission to better tell

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It’s still difficult for people today to fully grasp just how much slavery underpinned the wealth of modern capitalism. Leslie Harris, history

I often tell my students:
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the story of the enslaved people who were once responsible for the property's upkeep. "The newest literature on slavery is really connecting the dots in how we think about this economic relationship, but there is still a lot of mainstream resistance to those ideas."

That resistance is partly because of a post-Civil War mythology that lionized the North as freedom-loving liberators who vanquished slavery, defined as a uniquely southern evil — a mythology that Harris' scholarship helps complicate. "We've struggled for a very long time about how we claim these difficult times of our past," she notes

But Harris says that resistance to a deeper understanding of slavery's role in American history also stems from more recent efforts by some to obscure that past and to erect hurdles to learning about it as part of the standard K-12 curriculum. She contrasts her own upbringing, going

to an all-black Catholic grammar school in the early 1970s, where she readily encountered literature — even children's books — that frankly addressed slavery and social justice issues.

"There was a real consciousness in that time about those histories," she says. "The Civil Rights movement had just occurred and had encouraged this kind of momentous discussion and debate about what race means in society." Today, though, Harris says that even many of her students express surprise when they first learn certain details about African-American history. "They can't believe they've never heard these stories, which says something about the ways in which that history has been suppressed from the 1980s until now, in terms of high-school curricula and textbooks."

Harris says that those advocating to minimize the deplorable aspects of US history often do so by claiming

that talking about slavery or about the genocide of Native Americans would "instill shame into students."

However, Harris believes that such difficult conversations are imperative if America hopes to overcome its past and create a society that emulates its best ideals, ones that extol liberty and democracy. She acknowledges the difficulty of the task, in part because those ideals are actually quite new.

"I often tell my students: 'Slavery is an old idea. It's as old as human history.' So it's not surprising that we're still struggling with what freedom means, with what equality means. Certainly racial equality, but also gender equality. How do we really live into these things and how do we square equality with difference? This is a struggle, but it's a worthy struggle, and as a historian helping reveal how complicated our national narrative has always been, I hope to help us understand why it is so complicated now.

As these difficult conversations continue, she hopes that, over time, they will become increasingly constructive as more people understand the transformative potential of such engagement. "This kind of dialogue is not intended to disempower, but the opposite: to help us understand where we all come from and to try to move forward together into something better because of this greater consciousness."

AT THE CORE OF DISCOVERY

Research AVP Phil Hockberger loves technology, but he's hardwired for more than hardware



Phil Hockberger, Research AVP

Phil Hockberger is a “gear guy” at heart. He would have felt at home tinkering in Edison’s lab, or in Bell Labs where he did, in fact, work as a research associate for six years, building instruments including the first CCD-based microscopic imaging system (CCD chips were invented at Bell). Today, he oversees Northwestern’s most high-end scientific facilities and helps plan for their sustained growth.

The assistant vice president for research grew up in Calumet City, an industrial community in southeast Cook County where most of the kids circa 1970 went on to work in the steel mills that still clung to the local

waterways then. Hockberger, one of six sons, would pursue a different path, one that integrated chemistry, electrical engineering, biomaterials, and neuroscience. His family home was part of a tiny, two-block “island” of professionals — physicians, dentists, attorneys, businesspeople. His father was a civil engineer; his mother a college voice major. Neighbors included the city’s district attorney and Joey Mansueto, who would found Morningstar, the investment research firm. The Hockberger’s babysitter lived two houses down; that was Carole Browe (Segal) ’60, future cofounder of Crate and Barrel.

This environment gave Hockberger the foundation that would allow him to indulge a talent for math, an affinity for Italian Renaissance art, and an interest in exploring big questions at the intersection of science and spirituality. But he’s never lost his passion for the well-designed shiny object.

Hockberger loves tools, particularly the ones with dense acronyms or yard-long polysyllables in Northwestern’s 60-plus University “core” or shared facilities that enable transformative discovery in chemistry, biomedicine, engineering, and more. This is the world he’s inhabited since 2009, when he joined the Office for Research as its first director of core facilities. Since 2014 he has been executive director of research facilities, with a range of related strategic responsibilities, such as planning, maintaining, and developing the University’s state-of-the-art science spaces. These efforts have helped to make Northwestern a national leader in the field today, although Hockberger was pioneering the model for this infrastructure at the Feinberg School of Medicine back in the 1990s.

High-Impact Tools for Discovery

Interested in molecular visualization at the atomic level? Then check out

single-particle cryo-electron microscopy in Northwestern's Structural Biology Facility. Taking advantage of powerful new gene editing techniques made possible by CRISPR/Cas9? The MiSeq benchtop sequencing system in the Next-Generation Sequencing Facility (NUSeq) will let you screen your products. Need to determine the chemical structure of small molecules that you hope may yield the next blockbuster drug? Book some time with the triple-quadrupole mass spectrometry system available in the Integrated Molecular Structure Education and Research Center (IMSERC).

High-tech instruments often come with a steep price tag and even steeper learning curve, which is why they are organized in an affordable fee-for-service way to make them accessible to any researcher from Northwestern (and external customers), while also providing expert support to help investigators understand how best to employ these technologies. The facilities, which are located on both the Evanston and Chicago campuses, as well as in partnership with Argonne National

Laboratories and Northwestern Memorial Hospital, allow breakthrough discovery to occur and help to attract some of the world's best scientists.

"A core is a pivotal and essential part of the research ecosystem, one that facilitates interdisciplinary research and provides critical resources that enable new and emerging technologies," says Hockberger, highlighting aspects of the formal definition that he and his core facilities counterparts from around the country have recently articulated. "It's a lab, it offers expertise and state-of-the-art instrumentation and services, including experimental design and data analysis."

"Technique development" is the term Hockberger uses to describe an important part of his role, and the role of core facilities at Northwestern. While new tools are designed periodically, optimizing existing technologies to make them useful to investigators is vital.

"So many instruments are not designed in a way that lets you just put in your sample and get results out of the machine. It's not like that!" he

says. For instance, in the Biological Imaging Facility (BIF), operations director and cell biologist Jessica Hornick has had to find ways to help materials scientists obtain imaging data on samples that may or may not transmit light. Developing solutions to visualize these materials on a microscope presents significant challenges, but "that's the kind of problem solving that the core directors and the core scientists do," says Hockberger.

A neurobiologist by training, Hockberger earned his PhD from the University of Illinois at Urbana-Champaign in 1982, at a time when neuroscience was coming into its own, attracting faculty from across disciplines. These included electrical engineers like his dissertation adviser John Connor, and developmental neuroanatomists like Bill Greenough, an early explorer of brain plasticity, who was also on his thesis committee. Before this, though, Hockberger was still considering where to fully invest his talents. He earned a master's degree from Southern Illinois University in four quarters, designing a neuroanatomy project focused on

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A core is a pivotal and essential part of the research ecosystem, one that facilitates interdisciplinary research and provides critical resources that enable new and emerging technologies

Phil Hockberger, Research AVP



Valerie Tokars, an expert in macromolecular crystallography, talks with AVP Phil Hockberger inside Northwestern's Structural Biology Facility.

histological analysis of the traumatized brain. Encouraged by a faculty mentor in Carbondale, he ended up at Stanford where 18 months of research with mentor Klaus Bensch paid off with the publication of Hockberger's first paper in the journal *Cancer*.

"In that paper, I was the tissue culturist growing tumor cells," he says. "We were interested in the ultrastructure of the cells, so I learned electron microscopy." This experience launched his fascination with technology.

At Urbana, Hockberger pursued another interest that began a dozen years earlier, when he spent a summer as an orderly in the psychiatric ward of Our Lady of Mercy Hospital in Dyer, Indiana. "Patients suffered from schizophrenia, depression, and lots of neuroses," he recalls. "Brain behavior became really interesting to me."

Soon after, unfortunately, he got an even more intimate look at neurodegenerative devastation when his mother died from Amyotrophic Lateral Sclerosis (ALS) during his senior year in college. "It was a fascinating and tragic disease," he says quietly.

The \$6,000 CD Writer

When Hockberger arrived as a faculty member in Northwestern's Department of Physiology in 1987, the underlying concept of a core facility was not much different than what it is for today's facilities. It was an idea inspired by the original shared facility — the library, a central repository where scholars could access rare or expensive research materials, or materials that they only needed infrequently.

Hockberger developed two core facilities at the medical school, the Digital Darkroom (1994) and the Multi-Photon Microscopy Core (2004);

the latter would eventually garner federal funding and become a leading site for development of this technology. The Darkroom served its purpose and was shuttered in 1998, after everyone transitioned to digital media. In its time, though, it was a catalyst ushering in a new way of storing, accessing, and disseminating research data.

"Back then, I bought a CD writer that was \$6,000," Hockberger remembers. "It was \$2,000 for the hardware, \$2,000 for the backup memory device, and another \$2,000 for the software, called Toast. Within five years, it cost \$100 on a PC."

But during those five years, no one else at the University had these tools, he says, and there was broad interest in using them. So Hockberger volunteered to create the core, along with Kevin McKenna, a biomedical engineer within the physiology department. "We were the natural choice to build the Darkroom. We'd been teaching a digital imaging processing course on campus and had worked with students across both campuses and saw the need."

What counted as "high tech" 20 years ago seems quaint by modern comparison: ZIP drives and CD drives; film recorders and slide scanners; wide-format 1800-dpi poster printers. And yet these tools were crucial for about a five-year period in the 1990s when faculty were making the jump from analogue tools to digital ones.

The Darkroom was home to 18 workstations in all, including dye sublimation color printers and a Bio-Rad digital densitometer, which

allowed a researcher to scan a gel and make a logarithmic-to-linear conversion of the results, enabling quantitative analysis of two-dimensional gels.

“It was a critical and very popular facility,” says Hockberger.

Core Career Architect

Then, as now, it’s not just the impressive gear that attracts Hockberger’s interest. He is equally determined to help create a new professional path for those looking to make a difference in managing these core facilities. He’s traveled the country delivering presentations and serving as a spokesperson for career development, including as a founding member of the Midwest Association of Core Directors, a regional chapter of the 900-member-strong Association of Biomolecular Resource Facilities (ABRF). The ABRF honored Hockberger earlier this year for his “exceptional service to the organization and the shared resources community.”

Hockberger’s efforts stem from his conviction that core facilities, and the talent to run them well, will continue to propel scientific progress. “Cores offer an exciting career opportunity for scientists who are looking to make a difference, and I’ve become passionate about this mission,” he says.

Colleagues like Andrew Ott agree. “Phil has shifted the focus from cores being a common space to hold instrumentation and perform routine services to it being a resource where highly skilled scientists add significant value to the research enterprise,” says Ott, current director

of core facilities and IMSERC. “Phil invests much more time mentoring core facilities staff members, teaching them to understand their role and value and to provide education on the business principles required to run a successful core.” Technology is constantly changing, Ott adds, and so having the right people in core facilities to identify those changes and meet the evolving research needs of Northwestern scientists is imperative.

In his drive to professionalize cores, Hockberger spends a lot of time educating others about the importance and potential of these facilities. Though self-effacing, he’s an effective public speaker and “ambassador,” comfortable in front of an audience and able to distill complex ideas into more straightforward, engaging presentations. The same skills allowed him to teach adult education courses in the Chicago suburbs for more than a decade, producing classes that melded his interests in science and faith. (Titles included “How to Think about God,” “Christianity in a Scientific World,” “Science vs. Religion,” but also other topics, such as “The Art of Tragic Comedy” and “The Italian Renaissance: Portal into the Modern World.”)

Hockberger also draws inspiration and insight from his older brother, Robert, who has made major contributions to the creation of emergency medicine as a coherent field. Some of the same kinds of frameworks — establishing board exams and certifications, creating societies and professional

associations — may help core facilities develop further.

“There’s a whole infrastructure, a whole set of questions to answer regarding how you turn this into a true career path, where people say ‘I’m a core scientist’ and people know what that is,” says Hockberger. “Business training and leadership is a piece of it, and so are incentives. We are working on policies and procedures for the field and for Northwestern to make this happen.”

So, of the dozens of core facilities at Northwestern, what’s Hockberger’s favorite? Perhaps unsurprisingly, all of them.

“If I see something shiny, I’m there! I remember the first time I saw a molecular beam epitaxy at Bell Labs — all these vacuum valves — and I was like ‘*what is that?*’ Every lab I walk into, I go straight for the instruments and ask how they work. It’s not any one tool; it’s the entire world of these technologies that drew me into this field. At Northwestern, I’m like a kid in the candy shop.”

SOUND LEADERSHIP BEGINS IN SILENCE

Ethical focus, desire to make a positive social impact guides Kellogg professor and Northwestern trustee Harry Kraemer Jr.

It's midnight and the house is quiet. **Harry Kraemer, Jr.** is sitting in his study, reflecting on the day's events — good, bad, indifferent—and filling a journal with his observations.

He's done this most evenings for years, even back when his five children were all still at home here in Wilmette, Illinois; even when he was chairman and CEO of Baxter International, then a \$9 billion global healthcare firm with more than

50,000 employees in 100 countries. He works it in now despite busy days as an executive partner at Madison Dearborn, the Chicago-based private equity firm he joined in 2005, after 23 years with Baxter. The notebook is part of a disciplined routine and values-based leadership model that Kraemer extols in his books, blog, and at the Kellogg School of Management, his alma mater, where he teaches in the MBA and Executive MBA programs.

Leadership, according to Kraemer, requires true self-confidence, which he defines as a willingness to accept one's weaknesses as well as strengths, while committing to constant improvement. It also demands genuine humility; the ability to balance multiple perspectives; and daily reflection.

"We're moving so fast these days that it is easy confuse activity with productivity," says Kraemer, a Northwestern University Life Trustee. "You have to turn off the noise and figure out, 'What are my values? What really matters?'"

So he writes and reflects even though he's been a lifelong "numbers guy," with an early aptitude for mathematics, a talent with which he processed childhood. He funneled grade school civics class through arithmetic to memorize every US president from Washington to L.B.J. with unerring accuracy. He crunched baseball statistics to calculate Bob Gibson's earned run average and Willie Mays' batting average and slugging percentage down to the inning.

"Baseball was the only sport I really got into," says Kraemer, "because it's all statistics!" he says with a laugh.



Northwestern trustee Harry Kraemer Jr. The former Baxter CEO teaches leadership and strategy at the Kellogg School of Management.

He embraced history as a kid, too, but math was Kraemer's first love and would eventually lead him into economics and finance. In 1977, he earned his undergraduate degree from Lawrence University in Appleton, Wisconsin, where he met his wife, Julie, to whom he's been married for 37 years. (For their first date, on Halloween in 1976, Kraemer dressed as Jimmy Carter, wearing a jean jacket with peanuts sewn on; Julie went as Rosalynn Carter.) He earned an MBA from Kellogg in 1979, which enabled him to move into senior roles where he learned the importance of "knowing oneself" to be able to help others and shape institutions.

That perpetual quest for insight, night after night, leads him to his notebook, even after long days. There's a satisfaction in making an honest effort, whether or not you're tired. That's something his grandfather taught him decades ago while taking long walks in New York or Scranton, Pennsylvania. His grandfather would settle a youthful grumble with a retort that's become a refrain for Kraemer: *"That's why they call it work, chief!"*

It's advice that punctuates Kraemer's dynamic classroom presentations, serving as a touchstone within a rich narrative of corporate war stories and personal vignettes that showcase his leadership model in action. For him, leadership is a vocation, not a set of buzzwords. It's rooted in strong ethical values, anchored in community spirit and service to an enterprise larger than oneself, even though leadership, he says, begins to flourish within the individual — and

long before that person enters a boardroom.

"Leadership has nothing to do with titles and organizational charts," says Kraemer. "It has everything to do with influencing people and relating to them."

He provides an example from his career. Early in his Baxter tenure while in the acquisitions department, Kraemer was calculating the valuation of a company that Baxter was considering buying. He couldn't get the value above \$50 million, which meant there was no financial justification to pay more than that. His own boss praised his analysis, even while admitting that "those guys" are going to make the deal — for \$100 million. "It's done, Harry. Leave it alone."

This went against Kraemer's logic. Making matters worse, Kraemer couldn't get his boss to reveal who "those guys" were. Fueled by his conviction that the company was about to throw away \$50 million, Kraemer decided to take matters into his own hands and "accidentally" bump into the CEO, Vernon Loucks Jr., the next day in the cafeteria.

Loucks arrives right on time and affably greets the junior employee who just happens to be hunting for the same breakfast. He asks Kraemer what department he's with. Before long, Kraemer convinces Loucks to review the numbers that "those guys" greenlighted. The deal gets quashed. "As I'm leaving his office later that day, he stops me and says, 'Harry, any time someone tells you to do something and they don't give you a really good reason, push back until

they make the right decision.' I said, thanks, because I was starting to think that you were one of 'those guys.' He looked at me and asked: 'Who are those guys?'"

Kraemer is effusive and intense, forthright. He's a person who talks to the custodian as easily as the CEO, and who doesn't think this makes him a saint. It's just what decent people do. He's happy to show you the cards because he prefers you learn the game too, and, well, he's won plenty already. Plus his folks and close-knit family (three younger brothers and one sister, who he says all got along exceptionally well and still do) taught him "not to get caught up in the whole material thing." His father worked in the financial sales for CIT Group Inc. His mother was a secretary.

Today, Kraemer seems driven by kind of focused urgency. That's because he wants to get this right, make an enduring contribution. And the clock is ticking. At 62, he hopes to teach for another 20 years. He's got the passion for it, but each day is a gift and this realization is never far from his mind. "We're in this life for such a short time, the blink of an eye," says Kraemer, with such conviction that the fact settles in the bones as if for the first time. "What are you called to do?"

He sounds like the Catholic priest he once thought he might be, at age 13, talking about that vocation with his Uncle Francis, his dad's brother, who was a priest. Francis convinced his nephew to consider ministering to a flock outside the church — maybe in the business world. Plenty of folks who could benefit from someone who

emphasized how the Golden Rule could animate the commercial world to better purposes.

Kraemer demonstrates an unshakable faith that he can play a modest but important part in helping the next generation of leaders succeed. He's not Pollyannaish, though. He knows the importance of talent, discipline, diligence, and luck, too. But he starts from a premise that leadership's four pillars, as he articulates them, can benefit almost anyone.

"You don't have to have an executive title to be one of those of 'those guys' to start your leadership journey," says Kraemer, referencing his shorthand for the stereotypical upper-management honchos who call the shots. Better, he says, to work hard, smart, and with unflagging determination to make a difference. "When you do, you may discover that you are 'one of those guys.'"

Northwestern Research News spoke with Kraemer about his leadership model and career.

What's the basic purpose of being a value-based leader?

Value-based leaders help their teams understand and navigate what I call getting from the roots to the trees to the forest — to move through the micro to the macro levels of a situation. The best leaders tend to

have the capacity to keep things simple and apply common sense, which is not common. That's not to say that you never get into the weeds. The problem, though, for some people, is they dive down to the bottom of the pool and they never come back up. The ability to go down and then come up again is huge.

You focus on four principles that guide values-based leadership.

What are these?

I encourage my Kellogg students to cultivate self-reflection, balance, true self-confidence, and genuine humility. Reflection is the most important because it helps you determine your values and purpose and what really matters. Balance lets you benefit from different perspectives to gain holistic understanding. True self-confidence is more than a collection of great skills, though that's also important. This confidence lets you accept yourself as you are — strengths and weaknesses — while being determined to keep improving. Genuine humility keeps your feet on the ground and reminds you where you come from. It helps you sincerely value and respect others. If you can get better on these four principles, you can lead anything.

How do you define success?

I immediately think not about

conventional success, but about significance. You and I are passing through this world for the blink of an eye. What difference can you make? What are your values? What's your purpose? What are you called to do? Rather than getting preachy about it, I really think that, by living as an example to others, we can have an enormous positive impact.

Yet, you've enjoyed conventional success, too. You've managed to walk a line that seems difficult, one that melds material success with genuine spiritual depth.

It's all related to balance. If you work hard and do a good job, treat people well, you're probably going to do well. A big part of this I learned from my family. Do well, but don't get caught up in the whole material thing. You don't have to be a monk about it. You can buy yourself something nice. But the key phrase my father always told us is "never be possessed by your possessions." Keep it in perspective. One of the unfortunate things — and this is critically important — we're moving faster and faster and may have confused activity and productivity. Turn off the noise, turn off the gadgets. Unless you take time to reflect on your values and strike a balance, it's very easy to get caught up in materialism. You end up saying, "Oh, I need a bigger job! I need more money!" As if somehow that's going

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You don't have to have an executive title to be one of those of 'those guys' to start your leadership journey. Harry Kraemer Jr

to make me happy.

Who were your early mentors who inspired you?

I was fortunate to have a very close family. I'm the oldest of five children and I still talk to my siblings every couple days. One of the things my parents really emphasized is that we all get along. We'd all go to the movies together — even when I was a junior or senior in high school. Family was always very important, and to me this is the hallmark of what matters and why I've always tried to cultivate these values with my own children.

You often mention your grandfather when you teach.

What role did he have in your life?

My maternal grandfather, Farrell Grehan, was a history professor on Long Island in New York for 40 years. When I was 6, 7 years old, he'd walk me around the parks in Queens and would talk to me about Alexander the Great and the Romans and what the Greeks were doing. I got so involved in world history and culture. He'd always say, "Harry, I know you're an optimistic guy, but you got to understand how to think about people and relate to them, because, unfortunately, from the very start, there's never been a period where man hasn't been at war with man. Even slight differences cause friction. This inability of people to find common ground is a root of so much trouble." He had an enormous impact on me.

My grandfather also pushed me to go to a liberal arts college. Rather than deciding what I wanted to do for a career, he encouraged me to go to school to really understand history,

government, religion, science, mathematics, and the arts. I ended up getting a scholarship to go to Lawrence, a small liberal arts university in Wisconsin. At Kellogg, Don Jacobs, as a finance professor and dean, was an enormous mentor for me.

You almost chose a different path, not business or education, but the priesthood.

When I was a child, they would pray at Mass for vocations to the priesthood. "There's a shortage of priests, so we need to pray that more people join the priesthood." One Friday night at dinner, I got real serious and asked to talk to my dad's brother, Uncle Francis, who was a Catholic priest and who often joined us for dinner. We went into another room. "Father Francis, I just got to tell you: I think I want to be a priest." He says that's wonderful that you received a calling to do this! I listened to him and then said, "Father Francis, let me make sure you understand something: I don't think I have a calling. In fact, I'm a little disturbed by this whole thing. I'd like to get married. I'd like to have kids." So he looks at me and says, then why are we having this discussion? "Here's the reality," I told him, and maybe this came from my practical or math side. "We absolutely need more priests. Somebody's got to do it. And quite honestly, Father Francis, knowing my friends, if any of them becomes a priest, we're going to have a real problem, so somebody's got to step up."

What stopped you from becoming a priest?

Uncle Francis told me that one of his

frustrations was that the people he could impact were the ones already coming to church — not that they didn't need help too. But he often wondered how he might impact the people who don't come to church. He convinced me that a career in business, for example, could allow me to share my values — to live my values — in ways that might help others. I tried to do that throughout my career, at Baxter and now. I teach value-based leadership not only in the MBA program, but at companies, associations, and even high schools. I've done leadership seminars for rabbis, ministers, and priests, as well as school principals. I view it as a calling.

HOPE FROM THE LAB

Neurosurgical-oncologist Maciej Lesniak is part of a world-class Northwestern team aiming to develop breakthrough treatments for brain cancer



Neurosurgeon Maciej “Matt” Lesniak. Photo by Laura Brown

Northwestern Medicine neurosurgeon **Maciej “Matt” Lesniak** stalks an aggressive killer, and one of the most insidious: glioblastomas. These fast-growing, highly malignant brain cancers are fed by a rich blood supply and usually consist of a complex mix of cells whose microscopic roots sink deep into healthy tissue, threatening to erase our words, memories, and identity, making treatment

challenging and recurrence likely.

Relatively rare among the 100 or so brain and nervous system tumors, glioblastomas make up about 15 percent of all primary brain tumors, with some 12,000 new cases reported each year, including those of high-profile patients like Senator John McCain (R-Ariz). Prognosis is grim. Even with treatment, median life expectancy after diagnosis is 15 months.

Lesniak and his Northwestern colleagues at the Robert H. Lurie Comprehensive Cancer Center of Northwestern University are fighting back against these long odds, using both the laboratory and operating room in a quest to develop novel ways to attack brain cancer. The most recent attempt involves a new drug and an innovative approach that combines neural stem cells as a vehicle to infect cancer cells with a modified common cold virus. The pioneering effort, a collaboration among Lesniak, renowned neuro-oncologist **Roger Stupp**, and City of Hope’s **Karen Aboody**, gained the approval of the Food and Drug Administration (FDA) in 2017 and paved the way for the very first Phase 1 clinical trial, which is currently ongoing.

“This is the first time that the FDA has allowed a clinical trial of this sort to occur at the time of initial diagnosis,” says Lesniak, the Michael J. Marchese Professor and chair of neurological surgery at the Feinberg School of Medicine.

The vast majority of clinical trials, he says, happen only after a patient undergoes surgery, chemotherapy, and radiation and has suffered a

I was amazed to learn that a surgeon could do more than just operate, that they could bring this scientific approach to their work.” Maciej “Matt” Lesniak, Chair of neurological surgery

recurrence of cancer. The Northwestern team earned the FDA greenlight to use stem cells to deliver an oncolytic virus — one that preferentially attacks cancer cells while leaving other tissue unharmed — to learn whether this approach could work synergistically with traditional treatment protocols to extend the survival rates of patients with glioblastoma.

“We have done a lot of preclinical work that suggests we should be treating patients up front, not when they recur,” says Lesniak. Currently, six patients are enrolled in the study.

Formidable Challenges

Glioblastoma’s deadly pathogenesis makes it easy to understand why patients would be desperate for hopeful intervention, sooner not later. In addition to the body’s robust immuno-defenses that confound treatment, these cancers are notoriously resistant and difficult to treat because of where and how they grow. Their often-eclectic cellular composition also poses challenges, since some kinds of cells prove much more difficult to kill.

“These tumors affect the very core of who we are,” says Lesniak, who joined Northwestern in 2015, after

serving as the director of Neurosurgical Oncology and the Neuro-Oncology Research Laboratories at the University of Chicago. Drugs that could fight the cancer might also cause dementia or destroy memory, vision, or speech. “Whenever we introduce a therapy, we have to consider the benefits versus the harm. Anytime we try to kill this cancer that is already killing the essence of who you are, we may actually destroy who you are as a person.”

Another major hurdle is delivering drugs to the tumor site. Physicians must get past the blood-brain barrier (BBB), the thick band of blood vessels that protects the brain from toxins, including most chemotherapeutic drugs, says Lesniak. (One notable exception: temozolomide, an oral medication that, in 2005, Stupp demonstrated could be effective in treating glioblastoma. It is now a front-line standard of care for these cancers.) Because of this barrier, physicians often employ other strategies, such as direct injection or implanting catheters in the brain cavity to infuse medicines. Even with injection, it is problematic to disseminate the drug throughout the tumor mass. Lesniak’s innovation, a

decade in the making, seeks to address this problem.

“Working with my colleague Karen Aboody, I came up with this idea: what if we were to use stem cells almost as cars for these passengers, which are viruses?” says Lesniak. “Neural stem cells tend to travel within hours to areas of injury, areas of stroke or brain tumors. They could disperse the oncolytic virus with a beautiful homogenous spread.”

Bench to Bedside Innovation: A Team Effort

That approach requires collaboration among physicians with a shared passion for eradicating disease along with an institutional ecosystem that nurtures research, teaching, and clinical practice. Lesniak says that Northwestern provides exceptional resources and leadership to attract top global talent, including more recent hires, such as Stupp, biochemist **Ali Shilatifard**, and neuropathologist **Dan Brat**.

“What makes us so effective at Northwestern are the people,” says Lesniak. “Our leaders at the School of Medicine and at Northwestern Medicine — Eric Nielson and Dean Harrison — have a shared vision for

making a difference in cancer research, not just in Chicago or the region, but across the country and the world.”

Often, that talent includes physician-scientists who bridge the research lab and clinical practice and whose efforts, in conjunction with the support of the Lurie Comprehensive Cancer Center, directed by **Leonidas Platanias**, can launch clinical trials that offer unique potential for patients.

Lesniak is himself an internationally recognized physician-scientist. He was awarded the 2015 National Cancer Institute Outstanding Investigator Award — one of only 50 in the United States — for his transformative cancer research. He has been overall primary investigator or site primary investigator of more than 25 multi-institutional clinical trials for recurrent and newly diagnosed malignant gliomas involving these biological therapies.

A native of Krakow, Poland, Lesniak grew up as an only child surrounded by the old city’s rich history of culture, tradition, and academic rigor. Home to one of the largest public squares in Europe and one of the continent’s oldest research institutions, Jagiellonian University, Krakow offered Lesniak an invigorating mix of ancient and modern. He recalls always valuing education and languages (he speaks four of them), but was passionate about skiing.

“I was competing all the time as a kid,” he says. When he was 14, his parents brought him to the United States. “Unfortunately, Chicago put

an end to my skiing!” he says laughing.

His mother, a now-retired obstetrician, was an early mentor who helped spark Lesniak’s interest in medicine. He would go on to Harvard College and Johns Hopkins, where he earned his medical degree in general surgery and then neurological surgery and neuro-oncology. Mentors there included Henry Brem, a neurosurgeon who also invented Gliadel wafers to intraoperatively deliver chemotherapy to brain tumors. “I was amazed to learn that a surgeon could do more than just operate, that they could bring this scientific approach to their work,” says Lesniak. “This was very inspirational to me.”

Today, Lesniak says he is inspired by his own exceptional Northwestern colleagues, and he has tried to serve as a role model for the next generation. During his 2003-15 tenure at University of Chicago, he won the John Arnold Award for outstanding mentorship of medical students. In fact, several of the postdoctoral students that worked in the Lesniak lab at Chicago are now on faculty at Northwestern, pursuing their own NIH-sponsored research.

One of those students, **Derek Wainwright**, remembers Lesniak providing “unprecedented freedom to develop my own experiments, test my own hypotheses, and eventually be a strong enough candidate for faculty recruitment opportunities at many leading academic medical centers.” Wainwright says a pivotal lesson learned in the Lesniak lab was



Neurosurgical-oncologist Maciej “Matt” Lesniak is part of a world-class Northwestern team aiming to develop breakthrough treatments for brain cancer.

“ignorance” — never assume anything, and question everything. He says the Northwestern brain tumor community is remarkable for its talent and bold vision.

Another former postdoc, **Irina Balyasnikova**, cites Northwestern’s collaborative culture as an institutional strength, one championed by Lesniak. “Our team of exceptional investigators draws upon a broad range of expertise, encompassing genetics, epigenetics, pre-clinical model development, cancer stem cells, cell-based targeted therapy, immunology, virology, and nanotechnology,” says Balyasnikova, whose research includes an approach that tries to engineer patients’ immune cells to attack tumors.

“We are surrounded by people at Northwestern with a passion and with great ideas who inspire us to think creatively to move the field of

EXPLORING THE JOURNEY OF DISCOVERY

Mary Pattillo's groundbreaking scholarship on the black middle class has made her a celebrated thought leader in her field.

Two of her books, *Black Picket Fences* (2nd ed. 2013) and *Black on the Block* (2007), are seminal explorations of race and class focused through the lens of South Side Chicago neighborhoods, including North Kenwood-Oakland (NKO), a “self-consciously black community.” NKO underwent rapid gentrification in the late 1980s when its residents tackled crime and poverty through urban renewal. The role of black professionals in advancing such change was little studied, though, one reason why Pattillo took on the research challenge.

The black middle class and their residential enclaves are nearly invisible to the nonblack public because of the intense (and mostly negative) attention given to poor urban ghettos,” writes Pattillo, sociology and African American studies, in *Black Picket Fences*.

Countering this perception, Pattillo provides a richly nuanced picture of community life that transcends monolithic depictions of the black experience. While blacks may share some broad affiliations — such as

membership in the Democratic party — they hold disparate views on jobs, schools, housing, and economic development. On these subjects, “the black position becomes many positions, split along lines of seniority in the neighborhood, profession, home ownership, age, and taste,” Pattillo has said.

Pattillo's scholarship draws upon her own experiences as an NKO resident; she moved into the neighborhood in 1998 and has lived there since. Her early life growing up in Milwaukee, perennially one of America's most racially segregated cities, also shaped her research interests. In fact, though Pattillo was an urban studies major at Columbia University and earned her doctorate at the University of Chicago, working with renowned sociologist William Julius Wilson, she considers her career to have started much earlier.

“I often say that we sociologists have long been sociologists,” she says. “I think I was a sociologist back in high school, when I was bused from the city to Whitefish Bay, a suburb that we jokingly called ‘White Folks Bay.’”

Since 1998, Pattillo has been a Northwestern faculty member. She has been chair of the Departments of Sociology and African American



Mary Pattillo, sociology and African American studies

Studies and she holds the Harold Washington Professorship of Sociology and African American Studies.

Research News spoke with Pattillo about her work.

What early influences encouraged you to explore the social sciences?

Mary Pattillo: I'm an urban sociologist and a sociologist of race and ethnicity. High school was definitely a turning point for me and oriented me towards this career. I lived in an all-black neighborhood and went to an all-black elementary school. For high school, I first attended a pretty elite private school and then hated that so much that I

became part of a desegregation program that bussed kids to the suburbs from Milwaukee, which was and remains among America's most segregated cities.

What was that experience like?

MP: Structurally, desegregation did not lead to integration because the school day's organization made integration impossible. All the black students and a couple of Latino kids came in on the city bus every morning. The school had an open campus so students could go home for lunch. But we weren't able to go home like everyone else who lived in the neighborhood. We were stuck on campus with some vending machines. After school, we couldn't participate in extracurricular activities because we had to get home on the bus.

Did the suburbs seem dramatically different from your home in the city?

MP: I saw clear inequalities. I come from a very highly educated family: My father is a doctor and my mother has a master's degree in mathematics. So it wasn't that my family was poor — though my parents were frugal — but my neighborhood was lower middle class, while the suburb was much more upper income. That experience definitely got me interested in what I study today.

Your research on the black middle class has advanced discourse on an under-explored demographic.

What attracted you to the subject?

MP: At Columbia University, I met black folks who grew up in the suburbs and in white neighborhoods

and I thought, "Really? Black people live in the suburbs?" It was a revelation that made me aware of class diversity within the black community, which was something I wanted to study. A lot of the sociological literature then was focused on poor blacks, and I felt that this was a narrow view. My own experience, and the experiences of others I knew, was absent from that depiction.

What role do black professionals play in the communities you've studied?

MP: It's often complex. The black middle class can exacerbate or mitigate inequalities. In *Black on the Block*, for example, I present the case for and against public housing. Black professionals moving into the neighborhood argued that the community was overburdened with public housing and that this concentration of poverty leads to bad outcomes, including lower wealth for black homeowners. Their idea was to spread public housing more evenly across the city.

They argue that black homeowners and neighborhoods would be better off. But in making that argument, these professionals were planning to displace poor black people who had lived in this community for generations — doing so just at a moment when the neighborhood itself was improving and when these families might benefit from the improvements. So you see this tension. Their logic was not to protect the interests of poor black folks, but to protect the interests of the black community overall, which was assumed to be monolithic.

Discussion of school choice, like housing, creates similar tensions. Proponents of choice argue that an educational "marketplace" spurs competition and systemic improvements. What does your research show?

MP: We must recognize that choice is often a burden for many people from disadvantaged families. People want good schools for their kids. But the choice process requires, for instance, taking the bus to four different open houses, and taking time off from work to attend those events. It means having access to the Internet to do the research on schools. It means understanding many different application processes and deadlines and making sure your child takes the test for the selective enrolment schools. For parents who are barely making ends meet, or who are working multiple jobs with limited flexibility, or caring for sick family members, school choice burden adds another responsibility to their full plates.

How can we improve the process?

MP: There are efforts to make the process easier; standardizing application deadlines, getting more information to these families. But no matter how much easier we make it, there will always be inequalities in parents' abilities to navigate the system because of time or money. So the only way to really address educational inequality is to have high-quality schools that don't require any choice, which is the neighborhood school model. You wake up on September 6 and roll your kid out of bed and roll them into school — and that school is a good

SARATSI SEES NEW HOPE FOR TREATING PEDIATRIC CANCERS

Amanda Saratsis, neurological surgery, seems optimistic and projects a gracious, compassionate spirit. She might be forgiven if she didn't, though, since she's confronted daily by the grim medical prognoses of pediatric brain tumors.

Her research and clinical practice involve treating high-grade and brainstem glioma — specifically, diffuse intrinsic pontine gliomas and glioblastoma multiforme — solid body malignancies with a median survival rate between 15 months and three years.

What does inspire this pianist-turned-physician are recent advances in molecular biology and neurosurgery that could improve the lives of those afflicted by rare but devastating cancers. Over the last five years, technology has enabled physicians to obtain and analyze tissue specimens they previously couldn't. This, combined with next-generation genomic sequencing, is heralding “huge advances in neuro-oncology,” including new surgical protocols and clinical trials, says Saratsis.

Her patients and their families, of

course, also motivate Saratsis and the research team in her laboratory at Northwestern's Feinberg School of Medicine. The group studies pediatric brain tumors to identify and test novel molecular targets for more effective therapies.

“I'm in awe of these kids,” says Saratsis. “They are so strong and just want to be well, and they believe that they are going to get better.”

Born and raised on Chicago's South Side, Saratsis comes from a blue-collar background: “There were pipe fitters and teachers in the family, but no doctors,” she says. “My dad, who worked for the phone company, taught me the value of hard work and a job well done.” Her passion for discovery was encouraged early, including through nature walks with her mother and “experiments in the kitchen sink.” As a girl in the 1980s, Saratsis showed unusual interest in human genetics and HIV after watching a documentary on the subject, so her parents brought her to the library to learn more, and even arranged for their pediatrician to share some insights.

During high school, in her first job as an activity therapy assistant in an Alzheimer's ward, Saratsis played tunes from the 1930s for patients who “couldn't remember the faces of their children but would remember the words to these songs,” she says. The experience helped shape her decision to attend Northwestern, where she pursued a double major in piano performance and molecular biology before going on to earn a medical degree from the University of Illinois-Chicago.

As a KL2 scholar in the Multidisciplinary Mentored Career Development Program of the Northwestern University Clinical and Translational Science Institute, Saratsis will spend the next two years expanding her investigation into histones (a type of protein) and their role in pediatric brainstem glioma. Research News spoke with Saratsis about her professional path.

What initially oriented you toward a science career?

I grew up in an environment where there was discovery everywhere. My parents constantly fostered my curiosity. I'd ask a question and my



Amanda Saratsis, neurological surgery

mom would say “let’s go learn about it.” One time we went to the pediatrician’s office and there were microscopy pictures on the wall — images of dust mites and blood cells. I went home and drew them. I entitled them “the lung problem” and “the throat problem.”

Then there’s my dad, the quintessential handyman. We were always fixing things — plumbing, electricity — taking things apart and figuring out how they worked. That was kind of my “play.”

When I was in third grade, my family watched an HIV documentary. This disease that hijacks the body’s normal processes fascinated me. There was something tragic and poetic about that to me, even as a child. Our bodies are amazing yet fallible in their complexity. This interest led to my exploring the

physical substrate of disease.

You were so young. Were you frightened by these sobering forays into medicine?

As a kid, there’s wonder and mystery all around you, but you take for granted that you’re going to be healthy and that people know how to fix things when they go wrong. So learning about HIV really was an eye-opening experience. It scared me a lot. Yet, all these doctors and scientists working to help these very sick people also impressed me.

Because of my parents’ support, and my natural response to something I don’t understand, I wanted to learn more about this disease and in doing so make it less frightening.

Does that strategy still inform your research?

Very much. I work with families each day whose children have devastating

illnesses with terrible prognoses. But in mastering my subject and honing my surgical and clinical skills, there’s the opportunity to take away some of the fear and unknown, and this becomes a kind of answer to it.

It must be heartbreaking to see kids afflicted with these diseases. How do you cope with that part of the job?

I struggled with this during my pediatric neurosurgery rotation in residency. I talked with an attending physician, asking her how she dealt with it. She told me: “These children — our patients — are beautiful things that are in the world for a short time. And we try to take care of them when they need it.” These families have so much strength and so much grace, and these kids are so strong. I’m in awe of these kids.

I try to remember that every day is precious and that at any moment

“These children — our patients — are beautiful things that are in the world for a short time. And we try to take care of them when they need it.”

Amanda Saratsis

everything can change. I try to cherish what I have and be grateful. And this is important: I have to remember that I didn't cause this illness.

I can't take on that burden. What I can do is study and work really, really hard to offer my patients and their families state-of-the-art care.

What excites you about your field and gives you hope for better clinical outcomes?

We've seen cutting-edge technological breakthroughs, after decades of little progress. Until recently, we didn't understand the molecular biology of pediatric brainstem glioma because we didn't have any tissue to study. We couldn't remove these tumors surgically, and we didn't biopsy them for diagnosis, because we already knew the outcome. In 2010, my lab had just two tissue samples for study, so we wrote a protocol to collect tissues at autopsy. We did molecular analysis and proved that there was valuable information in these specimens. I also analyzed spinal fluid from children with brainstem glioma.

We were learning that this tumor's biology is vastly different from all other types of high-grade gliomas.

There have also been advances in neurosurgery. We now can insert a needle into the center of a child's brain with pinpoint accuracy — within a 10th of a millimeter— to get tumor specimens safely. Because of that advance, there are now biopsy-based clinical trials for stratification to treatment based on tumor biology.

We've also seen a huge advance in next-generation genetic sequencing. In the lab, I look at proteins that control gene expression and where they bind on DNA to reveal what genes are being abnormally regulated by these proteins. This helps us understand the pathways that lead to these tumors. It also lets us explore the potential for therapeutic targets.

The crux of all this hope was research in 2012 that identified a mutation in Histone H3 — a protein that is a major regulator of gene expression. We have since found that these mutations occur in 80 percent of brainstem gliomas and up to 50 percent of other pediatric high-grade gliomas. Never before has this mutation been identified in human disease, and it is unique to this cancer. We're learning that this mutation happens “upstream,” before other canonical pathways of cancer genesis. We usually think of cancers as being

secondary to mutations in the genome itself, and that's what people have been assuming for over 30 years with pediatric brainstem glioma. They'd been looking for specific mutations and using chemotherapies that worked for other cancers, but the drugs aren't effective for brainstem glioma.

Why?

Because there's an additional layer of complexity controlling tumor gene expression — an epigenetic regulation process. Five years ago we didn't understand this disease in this way.

What are the implications for treatment?

In my lifetime, I strongly believe that we will be able to take a child with a brain tumor to the operating room, perform a minimally invasive procedure to obtain tumor tissue, rapidly do a molecular analysis to determine the unique biology of their tumor, and then stratify them to a treatment specific to those biological abnormalities that are present to give them the best possible chance for a cure. That is absolutely achievable in our lifetimes, and we

WHY THE HUMANITIES MATTER WITH WENDY WALL

A caricature of scientific endeavor might place discovery at a remove from the people whose talents and curiosity drive progress, or those who benefit from it.

Of course, knowledge is actually rooted in the lived ideas, values, and challenges of individuals in society across time and space.

That's why at Northwestern the humanities are a vibrant, essential complement to the University's excellence in the STEM fields. Disciplines as diverse as history, anthropology, philosophy, language, religion, and law appear under the

humanities banner. These and other fields provide a powerful lens through which to explore human culture today and over the centuries.

For **Wendy Wall**, English and director of the Alice Kaplan Institute for the Humanities, these subjects exemplify Northwestern's commitment to wide-ranging inquiry. By preserving and extending traditional forms of knowledge, the humanities offer a rich, fascinating guide for how to live in a changing world. They help articulate our identity and aspirations. In doing so, they also inform our approach to science and technological innovation.

Yet, making the case for the humanities can encounter challenges in the Big Data era.

"Our society appreciates problems that can be answered by data," says Wall, an expert in early modern (1500-1700) literature and culture, including Shakespeare and the role of women in literary history. "But we often don't acknowledge the humanistic skills that underwrite that process."

The humanities teach critical and creative thinking, says Wall. They also provide the "foundational ethical evaluation of which problems to address." These disciplines offer the historical framework and "interpretive sophistication" to put modern solutions in context. "I don't think that the question of what makes us human is one that will be decided by a technological discovery," she says.

Wall is an award-winning scholar and teacher who, most recently, was elected president of the Shakespeare Association of America.

Research News asked Professor Wall to share her perspective on the humanities, her research, and her professional journey



Wendy Wall, English and director of the Alice Kaplan Institute for the Humanities

What was your earliest “scholarly” interest or discovery?

As a child and teenager, I worked during the summer in my father’s printing shop doing chores like cleaning ink and sorting paper. Eventually, I proofed copytext. On the few occasions that I was allowed to operate the press, I was mesmerized by the bulky machinery that could duplicate pages at lightning speed. My earliest “discovery” was the epiphany that the books I loved to read were also material artifacts, and that their incarnation as physical objects was very much part of their meaning. In fact, my dissertation became a story about how printing technology prompted Renaissance poets to reshape conceptions of authorship and reading. I found that this collision between technology and literary form was also a story about changing gender roles. All of my work to date has involved the study of women and gender in literature and history.

What shaped your interest in English and language?

My mother was a ninth-grade English teacher in a rural Alabama school. She wanted to offer students tools for appreciating literature but also for managing conflict — including heightened racial unrest. She taught Harper Lee’s *To Kill a Mockingbird* and Shakespeare’s *Romeo and Juliet*. My first introduction to Shakespeare was through the lens of its relevance to lived experience. I grew up listening to stories about how her students struggled with Shakespeare’s dense language and how she made these texts come alive for people deeply suspicious about

obscure and seemingly impractical artistic creations. From her stories, I saw how instrumental and empowering fictions could be for grappling with tough social issues. So from an early age, I had hands-on experience with books as typographical artifacts and as imaginative scripts that could have an impact on communities.

What most appeals to you about the humanities and your Shakespeare research?

I first became intrigued by Renaissance literature because of its immense cultural power and the dazzling complexity of its language. After all, the Renaissance was a time when politicians, scientists, and preachers prized literary writing as an essential skill and they used literature to achieve practical vocational aims. In my research, I enjoy tracking the ways that poems and plays — and even writing that we consider trivial, such as recipes — allow people to explore and test identities, political ideas, gender roles, fantasies, and emotions. Shakespeare’s works offer a stunning archive in this regard.

What can science learn from the humanities, and vice versa?

I’m particularly interested in Shakespeare’s era because the sciences and the humanities were not separate paths of knowledge-production. During this time, scientists wrote literary allegories to explain their experiments and playwrights tested new theories of cosmology as they spun their plots. Today these disciplines seem separate, but they have much to say to one another. Almost any issue that

scholars tackle — the environment, urban problems, or the human body — involves some knowledge that is deemed “fact” and some that is deemed “interpretation.”

If you weren’t a humanities scholar, what path might you have chosen?

I took a personality test in college to see what career might suit me. It matched me with three professions: teacher, librarian, or military officer. I never considered the latter, though I did think about being a lawyer. I don’t really fantasize about other careers because I can’t think of a profession in which I could so freely reinvent my sphere simply by choosing new intellectual challenges.

My projects have ranged from studies of domestic labor to the politics of devotional poetry; from the conditions of theater, to digital ways to map Shakespeare’s works as they travelled across the globe over 400 years. My first book [The Imprint of Gender] was sparked by a question that at first blush seems quirky: Why did early publishers present their books as imperiled maidens spied upon by voyeuristic publics? My latest project [Recipes for Thought] took me into the world of Renaissance recipes where I found that women in the kitchen sometimes wrote on food — a new form of literacy indeed! — while also conducting scientific experiments. Being a literary scholar and a teacher allows me immense intellectual scope.





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