

breakthrough

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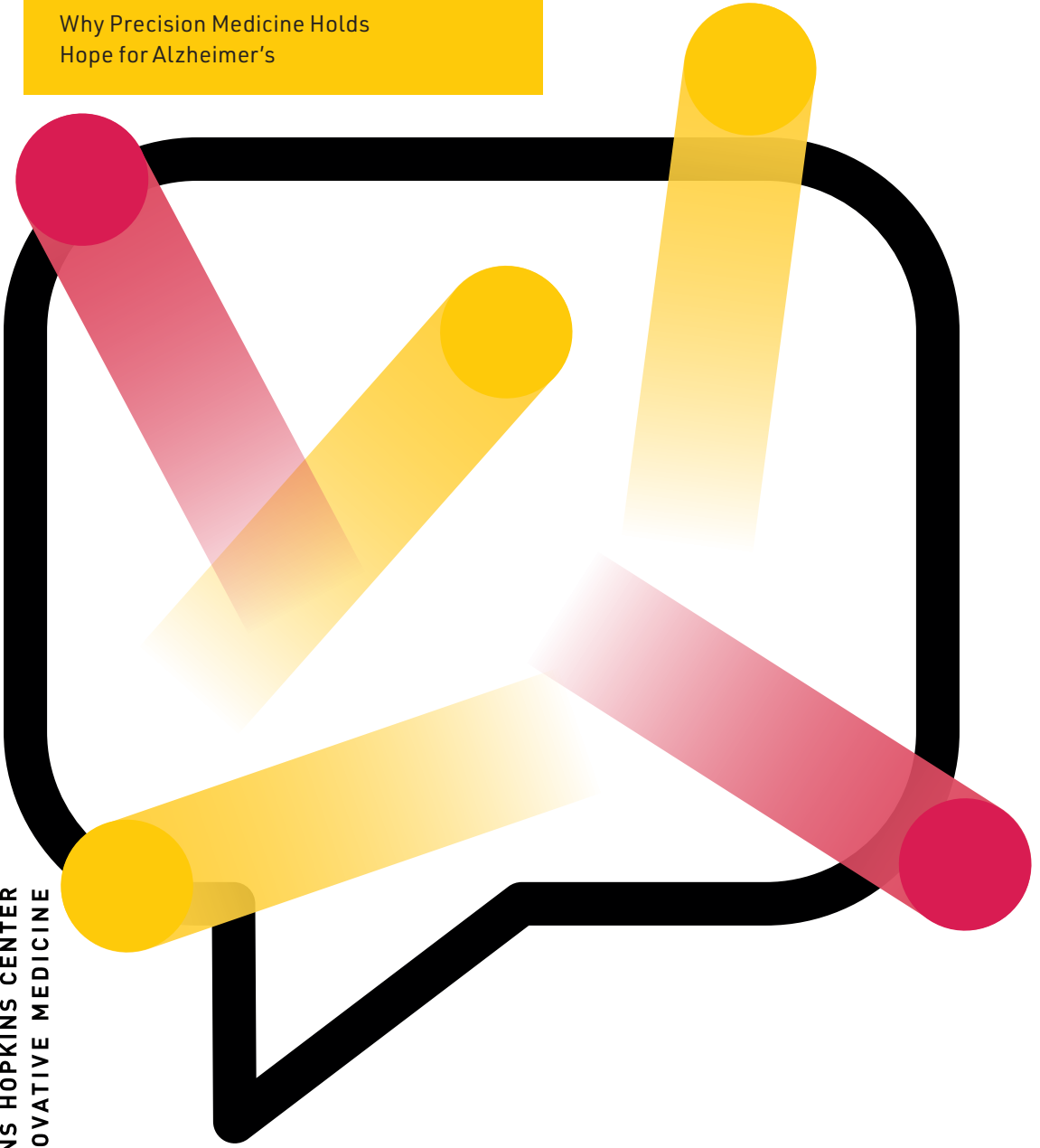
Words, Do No Harm

A Team Approach to Sarcoidosis

Seeking Wisdom from Medicine's Mentors

Why Precision Medicine Holds
Hope for Alzheimer's

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breakthrough



David B. Hellmann, M.D., M.A.C.P.
Aliko Perroti Professor of Medicine

A TIME FOR EVERYTHING

As I was reading over the stories in this issue of *Breakthrough*, the name of a currently popular movie came to mind: *Everything Everywhere All at Once*. The all-encompassing nature of the title of this award-winning film is an apt descriptor, I believe, of the incredibly far-reaching, broad-ranging efforts that so many CIM faculty and trainees are engaged in to advance the work of CIM's **Initiative for Humanizing Medicine**.

Consider the work of physician/bioethicist **Mary Catherine Beach**, for example, who is co-founder of the **Initiative for Humanizing Medicine** and the **Mary and David Gallo CIM Scholar**, whose research focuses on how respect and communication play out between patients and clinicians. She's found that the language doctors use in patient medical records can stigmatize patients, impacting future care and perpetuating health inequities. As you'll read on p. 2, Mary Catherine has emerged as a national leader in addressing this issue.

You'll also learn about the work of two CIM-affiliated physicians — one a rising star, the other an established international expert — who are both pushing exciting advances to improve the lives of countless patients. **Michelle Sharp**, a **Mary and David Gallo Scholar**, has her sights on improving care and treatment for sarcoidosis, a difficult-to-diagnose condition that can impact virtually every organ in the body (p. 8). **Constantine Lyketsos**, the **Alafouzos CIM Scholar** and a world-renowned leader in Alzheimer's disease care and research, is leading promising precision medicine solutions to dementia — solutions using stem cell technology that could be targeted "to reach the right patient at the right time with the right treatment," as he describes on p. 16.

Of course, giving the next generation of physicians the tools they need to get to know patients as people is crucial. Toward that end, we share the story of Osler medical resident **Amol Gupta**, and his *Medicine Mentors Podcast* and a spin-off *Personomics* podcast, which are both aimed at medical trainees (p. 14). And I think you will be particularly intrigued by the efforts of psychiatrist **Meg Chisolm**. A member of the **Miller Coulson Academy of Clinical Excellence**, Meg is a passionate leader in art museum-based medical education, which, as she explains on p. 18, can prepare doctors who are better equipped to deliver humanized care.

There's more, much more, in this *Breakthrough*, so I invite you to read it from cover to cover. And I'll end with a big thank-you. Without your generous support, we would not be able to mount such ambitious, impactful projects — *Everything Everywhere All at Once* — that have the potential to transform the very future of health care.

David B. Hellmann, M.D.

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Words, Do No Harm

Stigmatizing language in medical records follows patients, potentially exacerbating racial inequities, says Mary Catherine Beach, who is on a mission to raise awareness among physicians.

A Team Approach to Sarcoidosis

Michelle Sharp and her colleagues are making headway in their effort to improve treatment — and ultimately find a cure — for a debilitating condition that affects each patient differently.

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Seeking Wisdom from Medicine's Mentors

Building on the success of his popular podcast aimed at inspiring fellow trainees, Osler medical resident Amol Gupta will soon expand to offer a spin-off "Personomics" series.

Why Precision Medicine Holds Hope for Alzheimer's

Constantine Lyketsos believes there's real reason for optimism in the quest to develop treatments for memory-robbing conditions, thanks to advances in stem cell technology.

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Words, Do No Harm

In virtually every medical visit we have with a doctor these days, the physician makes notes about the encounter – information that goes into our electronic medical record, which subsequent clinicians will read and rely upon to help shape the care they provide.

Intentionally or not, those physician notes can include negative language about our encounter – stigmatizing language that has the potential to influence the attitude and behavior of other doctors who read the notes, says **Mary Catherine Beach**, co-founder of CIM's **Initiative for Humanizing Medicine**, whose 27-year career in medicine has focused largely on investigating how respect and communication play out between patients and clinicians, with the goal of improving care for each patient.

"I fundamentally believe that stigmatizing language is dehumanizing. It devalues people," says Beach, a **Mary and David Gallo CIM Scholar**. "And when negative language is used in a patient's medical record, it has the potential to impact future care of the patient and perpetuate health inequities."

In a qualitative study published in *JAMA Network Open*, Beach and her colleagues analyzed physician notes describing 600 patient encounters at an urban academic medical center. The team found five themes representing negative language used by the doctors. Importantly, she notes, the team also arrived at six themes representing positive language.

In the "negative" category are notes that question a patient's *credibility* (He claims that nicotine patches don't work for him) and those that show explicit racial or class *stereotyping* (Reports that the bandage got "a li'i wet"). Other notes describe a *difficult patient* by including details of questionable clinical



"I fundamentally believe that stigmatizing language is dehumanizing. It devalues people. And when negative language is used in a patient's medical record, it has the potential to impact future care of the patient and perpetuate health inequities."

Mary Catherine Beach

significance that depict the patient as belligerent, and a fourth theme shows the doctor's *disapproval*, often by highlighting a patient's poor reasoning (He was adamant that he does not have prostate cancer because "his bowels are working just fine.") Rounding out the list is a category Beach describes as *unilateral decisions*. This describes paternalistic language that upholds a power dynamic where the doctor presumes authority and portrays the patient as childish or ignorant (She was told to discontinue...).

"When I present our findings to physician groups, rather than any defensiveness, I usually get a very positive response," says Beach. "There's often an, 'Oh, yeah! We do write that,'" she says, adding, "Some of this language has been normal for so long, it didn't hit us that it was wrong or that it could hurt people."

But words *can* hurt, she notes. Patients who have difficult interactions with the health care system are at risk of distrusting or disengaging from care. "And stigmatizing language used in the medical record compounds this problem," she says, as the patient encounters doctors in sequence, with each doctor treating the patient in accordance with the impressions expressed by the previous physicians. In

"When I present our findings to physician groups, rather than any defensiveness, I usually get a very positive response. There's often an, 'Oh, yeah! We do write that.'"

Mary Catherine Beach

this way, negative feelings stay with the stigmatized patient. The cycle "perpetuates bias and inequitable care, further disenfranchising the patient."

Fortunately, Beach's study also came with the positive findings – "language we can use to humanize our patients," she says.

The six themes identified here include *compliments* (Mr. [Patient] is charming, pleasant and kind), *approval* (she struggled with quitting ... but as of this clinic visit has quit tobacco 1 week!) and physician *self-disclosure*, in which the doctor shares their own positive emotions related to the patient (I am happy to continue coordinating her care).

Other positive themes: *minimizing blame* (she has not been taking iron because it makes her constipated); *personalizing*, which involves incorporating details about the patient as an individual (She enjoys walking with her fiancé and her dog named Scout); and *bilateral decision-making*, which references incorporating patient preferences into the treatment plan.

In the time since this study was published, "interest in our findings has just exploded," Beach says. "I am asked every week by journal editors to serve as a reviewer for one or two other papers on stigmatizing language." And, she's been approached by the nation's two major medical records providers – Epic and Cerner – to join future working groups that will study how medical documentation can be improved by identifying and removing biased language.

"By enhancing awareness around physicians' word choice patterns and the potential consequences of those patterns," she says, "we believe well-intentioned doctors will be motivated to improve their documentation practices."

It's vital work, Beach says, that has the potential to be a "game changer" in transforming health care, particularly for the nation's most vulnerable patients. ■

A Nobel Laureate Looks Back

It's been 20 years since Johns Hopkins' **Peter Agre** won the Nobel Prize in Chemistry for his game-changing discovery of aquaporin water channels. Known as "the plumbing system of cells," aquaporins facilitate the movement of water across cell membranes and are now known to have a vital role in processes ranging from brain function to male fertility to hearing and vision.

At a recent CIM Seminar, dozens of CIM supporters and clinician-scientists gathered online with Agre, now director of the Johns Hopkins Malaria Institute and a Bloomberg Distinguished Professor, to reminisce about the exciting swirl of activity surrounding his Nobel honor and to learn insights he's gained over the last two decades.



ON THE MONTHS LEADING UP TO THE OCTOBER 2003 ANNOUNCEMENT OF HIS NOBEL PRIZE

"I had been invited to lecture several times in Sweden over the previous few years," Agre recalls. "Then out of the blue, I got an email from Bengt Nordén from Sweden asking if he could come visit me in the laboratory. This was unexpected. I didn't know who he was, so I called a colleague, who told me: 'You might be interested that he is chair of the Nobel Chemistry Committee.'

"His visit was very pleasant. He never talked about the Nobel Prize, and I didn't ask him about it," Agre says. **CIM Scholar Landon King**, a key member of Agre's lab team at the time and today executive vice dean for the school of medicine, recalls that Nordén and Agre spent much of the day examining old lab notebooks, "looking for evidence of the primacy of the discovery."

"It all became even more tantalizing when a Swedish television crew showed up in our lab on pretty short notice, with no explanation."

Peter Agre

"It all became even more tantalizing when a Swedish television crew showed up in our lab on pretty short notice, with no explanation," Agre says.

King adds, "We imagined it. To the point that I went out and bought bagels and balloons the night before the announcement was to come out."

ON THE 5:30 AM CALL THAT CHANGED EVERYTHING.

"On Wednesday of that first week in October, about 5:30 in the morning, the phone rang. I was ready," Agre says. "I answered, and a pleasant voice with a Swedish accent said, 'This is an important telephone call from

Stockholm for Professor Peter Agre. Are you Professor Agre?' I replied, 'I sure am!' Then they connected me with the Nobel Chemistry committee."

Agre learned that he shared the prize in chemistry with Rockefeller University's Roderick MacKinnon, for his work on the structural and mechanistic study of ion channels.

"I was instructed there would be a press conference in 20 minutes. I sprinted for the shower," Agre says. "Mary, my dear wife, called my mother in Minnesota. My mother was a farm girl who was very wise in the ways of humanity. She listened to Mary and said, 'Tell Peter that's very nice, but don't let this go to his head.'"

"Then Landon appeared at the door with balloons, and the *New York Times* was in the front yard. Johns Hopkins President William Brody called. I made my way into the lab, and by 10 o'clock in the morning, there was already a party going and champagne ripping open, and the day only got crazier."

ON NOBEL WEEK IN STOCKHOLM, DECEMBER 6-12

"It's a very compact week with multiple events every day — lectures by the Laureates and receptions. The ceremony itself is held in Symphony Hall in downtown Stockholm. Everyone is in formal wear: white tie and tails for men. They don't trust the Laureates to know how to receive the award, so they actually have a practice session earlier in the day. They instruct you where to sit, where to stand, how to approach the king, how to bow.

"Following the awards ceremony, there's a sit-down dinner for 1,100 people, served simultaneously by waiters, some of whom are opera singers, so it's a musical performance. There's really a lot of fanfare. During the banquet, one member of each prize is asked to give a three-minute talk. I gave a talk on science education for small children," he says.

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The celebration lasts well into the night with dancing and parties. “Then early the next morning, we had to get up for more Nobel interviews and visits.”

ON SCIENCE AS A TOOL IN DIPLOMACY

“Early in my career, I was very interested in international affairs and world events. I never thought I’d be a research scientist. In fact, I came to Hopkins with the idea of becoming a global health worker. When things started working in the lab so well, I stuck with it, but I thought that [eventually] I wanted to get more involved with bringing science to the public.

“I was elected president of the American Association for the Advancement of Science in 2008, which had a new Center for Science Diplomacy. When I became president, we had the first trips to Cuba, to North Korea and Iran. I made six trips with the AAAS. I even met with Fidel Castro himself, who was in his 80s. He was quite frail, but he had a very sharp mind.”

Agre also served as chair of the Committee on Human Rights of the U.S. National Academies of Sciences, Engineering, and Medicine from 2005–2007. “We were involved with seeking pardons and the release from captivity of scientists, engineers and health professionals from around the world. Between these two activities, I was really very busy.”

ON THE IMPORTANCE OF CROSS-TRAINING FOR YOUNG CLINICIAN-SCIENTISTS

“As a medical student, you learn a lot of information, but as a house officer, you really learn the diseases. I was a medical resident at Case Western Reserve, and program leaders there had adopted the Osler Medical Resident training model. That training really helped us anticipate what clinical defects would be caused by aquaporins. Clinical training also helps an individual develop good discipline. As an intern or resident, you’ve got to know the facts. There are no excuses.”

“Of course, every serendipitous observation is not going to turn out with an important answer. The challenge when you are sorting through the unexpected is to know when to pursue something and when to drop it.”

Peter Agre

ON THE VALUE OF SERENDIPITY

“The aquaporins were a clear serendipitous discovery,” Agre says. His lab had been focused on red cell membranes when his team came upon a protein fragment they couldn’t explain. “We were very interested in it because it appeared to have a shape suggesting it was a membrane channel, but red cells were not believed to have membrane channels.”

Agre consulted dozens of scientists about the mysterious protein (“It appeared to be a contaminant and had no clear functional role”) when hematologist John Parker at the University of North Carolina at Chapel Hill suggested that perhaps it could be a water channel. Agre and his team collaborated with Bill Guggino at Johns Hopkins to investigate the idea — which ultimately bore out.

“There was jubilation!” Agre says. “That experiment changed the focus of our laboratory entirely and my career as well.

“Of course, every serendipitous observation is not going to turn out with an important answer. The challenge when you are sorting through the unexpected is to know when to pursue something and when to drop it. If we had not figured out the function of the protein, we would have dropped it.” ■

HUMAN AGING PROJECT

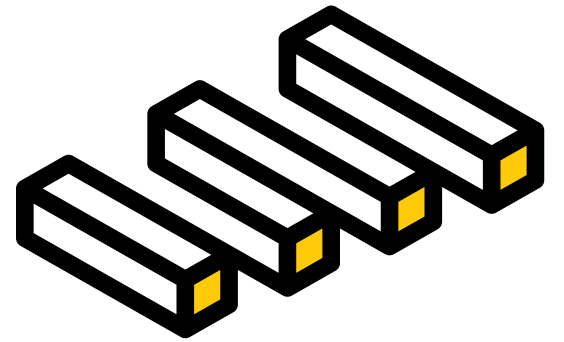
Bringing Together the Best Minds to Tackle Healthy Aging

When Charles Salisbury looks to some of the latest work coming out of the CIM-supported **Human Aging Project (HAP)**, he can’t help but smile. Take the new headset, developed by a cross-disciplinary group of trainees.

The headset promotes the kind of deep sleep that may protect against Alzheimer’s and other physical and cognitive decline. Called InWave, it uses electroencephalography to monitor brain activity and an artificial intelligence algorithm to time the delivery of specialized sounds that enhance the kind of brain activity needed for deep sleep. With financial support from HAP and other grants, the trainees are building 20 prototypes for use in a pilot study.

“The Human Aging Project is a great way to call upon the expertise of the very best minds across Johns Hopkins — from the medical school, engineering school, nursing school, public health school and business school,” says Salisbury. “I have great expectations for it, and I believe that **Dr. Jeremy Walston**, director of HAP, is the ideal ringleader for the project, as both a geriatrician specializing in the challenges of aging and as someone who has a unique knack for bringing the right people together to tackle big challenges.”

Indeed, Salisbury was among the earliest supporters of the Human Aging Project, which launched in 2021 (see box), when he and his family funded Walston as a **HAP Salisbury Family Scholar**. “This early seed money from the Salisbury family and other donors has been crucial to the success of HAP,” says **CIM Director David Hellmann**. “It has allowed our researchers to embark on projects that have subsequently garnered millions of dollars in grant funding from the National Institutes of Health and other funding agencies.” The Salisbury family subsequently went on to support clinician-researchers **Peter Abadir** and **Sean Leng** as **Salisbury Family CIM/HAP Scholars**.



Most recently, the Salisbury Family has provided funding for a fourth **HAP Scholar**. Walston is currently soliciting applications for the coveted scholarship from top research scientists across Johns Hopkins.

During his nearly 25-year tenure with global investment management firm T. Rowe Price, Salisbury guided creation of the Fixed Income Division, launched two fixed income funds, and led management of the firm’s large institutional assets, pension funds and endowments. “So I have some idea of what’s involved in developing a large project and selling it, both internally and externally,” says Salisbury. “I believe Jeremy Walston, with the leadership of David Hellmann, is very well equipped to reach out across Johns Hopkins for expertise. I don’t think we can even imagine, at this point, how many areas can be pulled together.” ■

About the Human Aging Project

The Human Aging Project (HAP), launched in 2021 and led by Jeremy Walston, the Raymond and Anna Lublin Professor of Geriatric Medicine and Gerontology, brings together experts from the Johns Hopkins University schools of medicine, public health, nursing, business and engineering to accelerate the development of knowledge and solutions aimed at helping people stay active and healthy in their later years.

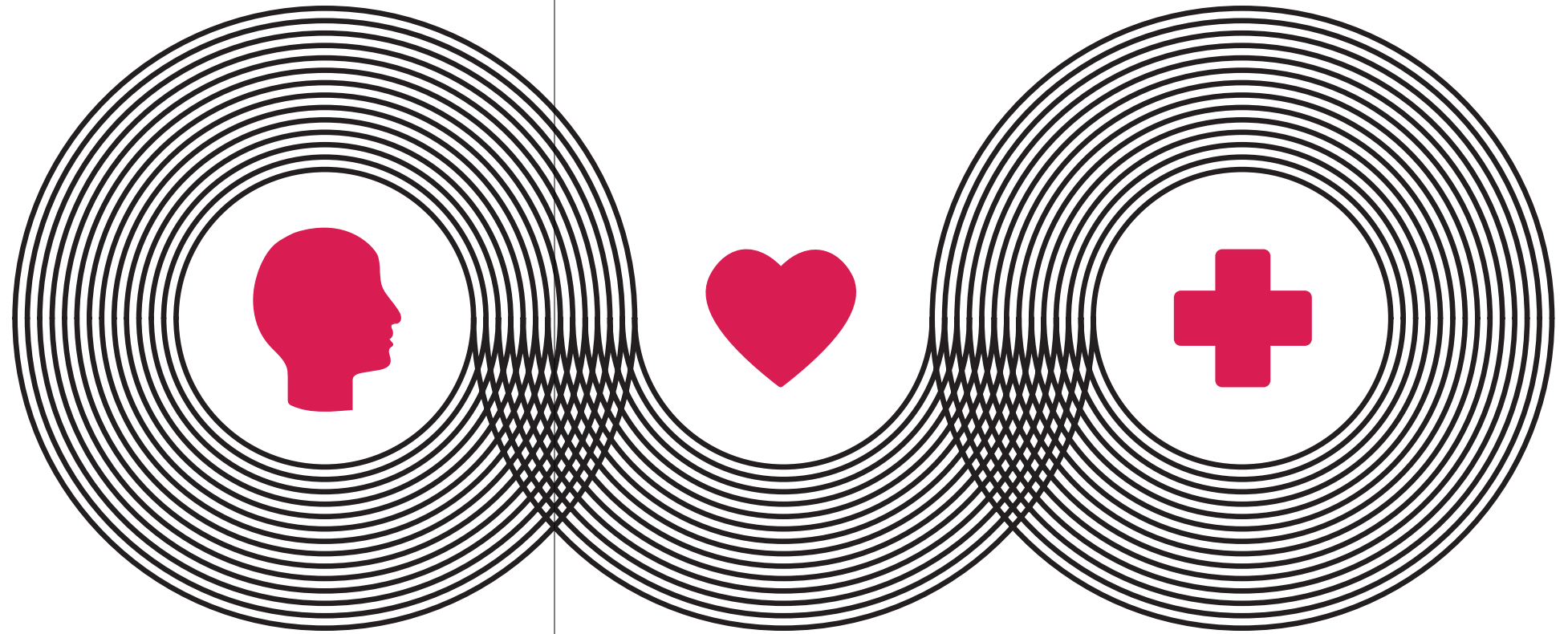
The Human Aging Project includes the Gerotech Incubator Program, a series of seven incubator hubs — focused on challenges in aging including fall prevention, neurodegenerative diseases, sociodemographic stressors and more — which bring together multidisciplinary teams of trainees to find solutions, such as the InWave device described above, through the power of technology.

A Team Approach to Sarcoidosis

While 90% of patients with sarcoidosis – an inflammatory disease in which the immune system overreacts – experience inflammation in their lungs, the condition can also impact the heart, eyes, nervous system, kidneys, bones, joints and skin. And every person with sarcoidosis is affected differently.

“So treating patients with sarcoidosis has to be a team effort,” says **Michelle Sharp**, a **Mary and David Gallo CIM Scholar** and co-director of the Johns Hopkins Sarcoidosis Program. Since she joined the Johns Hopkins faculty in 2019, Sharp has led efforts to expand the multidisciplinary approach of the Johns Hopkins Sarcoidosis Program. This strategic approach allows patients with multiple system involvement to receive the coordinated care they need in a timelier manner. She is also leading increased efforts in scientific research, which will one day allow for the development of better treatments for the difficult-to-diagnose condition, which has no known cure.

“By the time patients come to us, many have been suffering with unexplained symptoms for years. And it’s not unusual for them to have seen more than a dozen different specialists without getting an accurate diagnosis,” says Sharp. What’s more, current treatments – primarily steroids, such as prednisone – come with unwelcome side effects, such as weight gain, diabetes and hypertension.



Further complicating the picture: There are significant health disparities associated with sarcoidosis, with worse outcomes associated among lower-income patients, Black individuals compared to White individuals and females compared to males.

“If we’re going to understand the science behind this disease and figure out the best new treatments for our patients, we’re going to need to do it as a team, and that includes working with our patients as partners,” says Sharp.

LISTENING TO PATIENTS

That’s exactly what unfolds now each Friday at noon, when Sharp and a wide-ranging group of Johns Hopkins physician experts – including neurologists Barney Stern and Carlos Pardo-Villamizar, cardiologist Nisha Gilotra, pulmonary hypertension specialist Stephen Mathai, pulmonologist and clinic co-director Edward Chen, and many others – meet to review and coordinate care for the 2,000-plus patients who visit the John Hopkins Sarcoidosis Program for care.

Helping patients navigate visits, which include imaging and blood tests, falls to a dedicated team including medical office and patient coordinator Terri Bennett and nurse practitioners Kayla Nyakinye and Victoria Wotorson.

Sarcoidosis often strikes patients in the prime of their lives, between ages 20 and 40, and the impact can be sudden and devastating. “I had one patient in his 20s suddenly pass out at the beach. The next thing he knew, he was in the hospital being equipped with a pacemaker,” Sharp says. “Other patients develop lung scarring that severely restricts their ability to work.

“While our internal team is important, our external team plays a vital role as well,” says Sharp, speaking of the nine-member Patient Advisory Board she established in 2020, which meets on a quarterly basis. “As we were building our capacity, it was so important to me that we hear from our patients so that we could learn firsthand their needs and the challenges they face,” she says.

“By the time patients come to us, many have been suffering with unexplained symptoms for years. And it’s not unusual for them to have seen more than a dozen different specialists without getting an accurate diagnosis.”

Michelle Sharp

CONTINUED ON PAGE 10

The first initiative of the Patient Advisory Board was to create a Patient Support Group, which now meets the first Monday of every month to provide patients a forum to share their own experiences and connect with others. The Zoom meetings feature an informational talk by a Johns Hopkins sarcoidosis specialist, such as on managing fatigue, followed by breakout room sessions for patients to share experiences and “help patients to realize they are not alone,” she says.

ELIMINATING HEALTH INEQUITIES

While Sharp stays busy seeing patients, she notes gratefully that her Gallo Scholar funding has made it possible for her to advance work in patient education, an avenue that has personal resonance for her.

“My sister and I are the first in our family to attend college — and I’m the only professional in my family and the only physician,” she says. “I’ve had the opportunity to help navigate the health care system for my family members, and that’s helped me recognize the importance of using language that patients understand.”

She has developed a series of resources for patients to foster shared decision-making in their treatment and, working with members of the Patient Advisory Board, is currently fine-tuning an education series for patients with lower health literacy.

That work builds on research she’s conducted. Sharp co-authored the first observational study of medication adherence in sarcoidosis, which found that participants with better adherence reported better health-related quality of life.

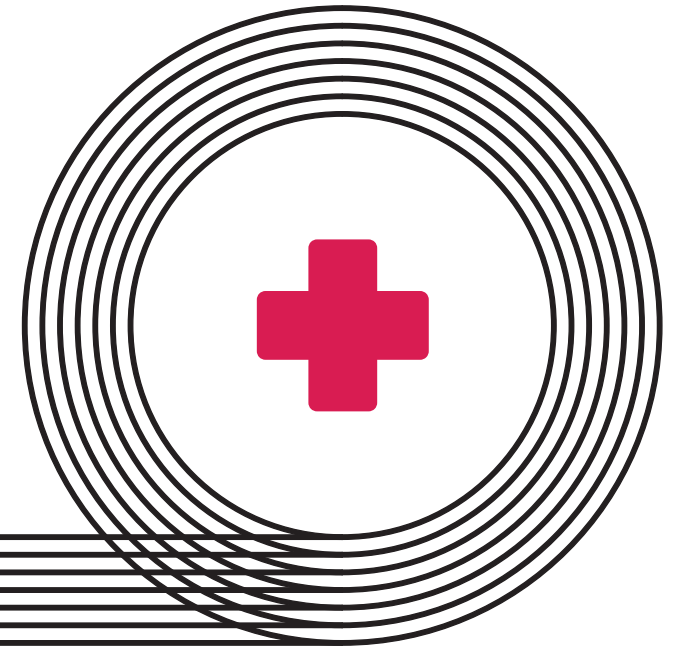
“If we’re going to understand the science behind this disease, and figure out the best new treatments for our patients, we’re going to need to do it as a team, and that includes working with our patients as partners.”

Michelle Sharp



“One of my goals in improving clinical outcomes for patients with sarcoidosis is to eliminate health inequities,” Sharp says. “Moving forward, I would like to understand more fully what factors determine whether or not a patient takes their medications, so that we can put better support systems in place.”

Ultimately, Sharp and her colleagues aim to find a cure for sarcoidosis, or at least develop more targeted therapies with fewer side effects than those currently available.



That research mission is getting a huge boost, Sharp says, with the establishment at Johns Hopkins of a multi-disciplinary Sarcoidosis Registry, which includes a biorepository holding patient data and biological samples.

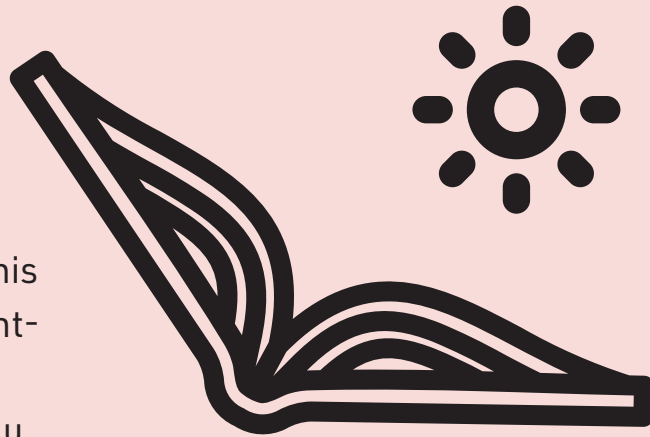
Sarcoidosis is relatively rare, “but here at Johns Hopkins we have more than 2,000 patients in our program,” she says, “Working together as a team, we are well positioned to solve the mysteries that have remained in sarcoidosis for more than 100 years.”

She adds, “Funding I have received as a **Mary and David Gallo CIM Scholar** has been instrumental for us to get this up and running.”

Sharp is optimistic that building a program of coordinated care and multidisciplinary research for sarcoidosis will put a cure within reach.

“My dream for our program is to have both sides of the bench — both translational and basic scientists — paired with clinicians from across disciplines and patients, all working together to move our knowledge of this disease forward,” she says. “Our patients deserve answers.” ■

Summertime... and the Readin' Is Easy



Whether you're unwinding at the beach, the mountains or in a hammock in your backyard this summer, here are three thought-provoking books – by authors with CIM connections – that you won't want to miss.

The Transformative Power of the Arts

“Many of us tend to think of the arts as either entertainment or as an escape. But what this book will show you is that the arts are so much more. They can be used to fundamentally change your day-to-day life. They can help address serious physical and mental health issues, with remarkable results. And they can both help you learn and flourish.”

So write **Susan Magsamen**, founder and director of the International Arts + Mind Lab, and Ivy Ross, Google's vice president of design for the hardware product area, in the introduction to their new book, *Your Brain on Art: How the Arts Transform Us*.

Magsamen and Ross take a broad approach, talking to fascinating people from all walks of life, including a traumatized firefighter who found solace through art, famed biologist Edward O. Wilson (before he died), musician David Byrne, and Susan's husband, Richard Haganir, director of the Johns Hopkins Department of Neuroscience.

Magsamen, whose International Arts + Mind Lab is part of the Pederson Brain Science Institute at the Johns Hopkins University School of Medicine, is also an assistant professor of neurology at Johns Hopkins, co-director of the NeuroArts BluePrint Project in partnership with the Aspen Institute, and author of seven previous books about art and learning, many for children.

“You don't have to be an expert or have a particular talent for art in order for it to have a tremendous positive impact on your life,” Magsamen says. “You can start right away. You don't have to spend a lot of money.” — *Karen Nitkin*

Lighting the Path to Healing

“To treat, even to cure, is not always to heal.” That is the guiding credo of Johns Hopkins psychiatrist **Kay Redfield Jamison's** newest book, her ninth, which offers an expansive cultural history of the treatment and healing of mental suffering.

Fires in the Dark: Healing the Unquiet Mind, due out in May, “is very much about psychotherapy. It is also about war and the trauma of war,” says Jamison, the Dalio Professor in Mood Disorders, MacArthur Foundation “Genius Grant” recipient and a 2018 Pulitzer Prize finalist for biography.

In *Fires in the Dark*, Jamison weaves in her own experience with bipolar illness, demonstrating how effective psychotherapy can be when it is done well. She also argues that not only patients but doctors

must be healed, using as one example W.H.R. Rivers, the psychiatrist who treated poet Siegfried Sassoon and other shell-shocked World War I soldiers.

Artists and writers also have a role in our healing, Jamison notes in her book, which examines the role that Paul Robeson — bass-baritone, stage and film actor, and activist — played in helping us to heal as a people.

“Jamison's elegant prose, imbued with personal warmth and deep humanity, is itself a solace,” writes Lori Gottlieb, *New York Times* best-selling author, “lighting the way on the path that leads us to a more peaceful present and imaginative future.”

Technology in Medicine: Empty Promises?

In the early days of the COVID-19 pandemic, **Jeremy Greene**, the **Leslie and Scott Jacobs and Stephen Rosenthal CIM Scholar**, like other clinicians, turned to telemedicine as a way to keep his patients at an East Baltimore community health center safe from the contagious disease.

Telemedicine wasn't new in March 2020, but the pandemic made it ubiquitous. The technology's grand promise, that it would increase access to care, particularly for disadvantaged people, would be tested in real time.

Greene, an internist who is director of the Department of the History of Medicine at Johns Hopkins and a member of **CIM's Advisory Committee**, has long been fascinated with the powerful and often-overlooked ways that the doctor-patient relationship is mediated by technology. He quickly saw that telemedicine was tremendously useful for patients with the technology and skills to log into the electronic system and use home-based equipment like blood pressure cuffs or pulse oximeters.

But patients without those advantages lost out, he writes in *The Doctor Who Wasn't There: Technology, History and the Limits of Telehealth*, his new book tracing the history of remote care.

A Guggenheim for Greene

Johns Hopkins medical historian **Jeremy Greene**, the **Leslie and Scott Jacobs and Stephen Rosenthal CIM Scholar**, is one of **171 scientists, writers, scholars and artists awarded Guggenheim Fellowships this year, a prestigious distinction that recognizes achievements and exceptional promise. His fellowship is in the category of the history of science, technology and economics.**

Guggenheim Fellows receive financial awards and were selected from a pool of nearly 2,500 applicants. The Guggenheim Foundation was established in 1925 by U.S. Sen. Simon Guggenheim and his wife, Olga Guggenheim, in memory of their son John. Since their creation, the foundation has provided nearly \$400 million in fellowships.

“Telemedicine, a technology that initially promised greater access to care to patients of color in poor urban areas, had in the crisis of the early pandemic come to serve more well-to-do, white patients who needed assistance least,” Greene writes.

For his latest book, Greene steps into the way-back machine and examines how four technologies — the telephones of the 1920s, radios of the 1940s, closed-circuit televisions of the 1950s and the connected computers of the 1960s — changed health care. Grand promises to the contrary, they didn't erase health disparities and often made them worse.

That historic perspective helps Greene see the promise of the present moment and how easily it can slip away. As his book shows, each innovation was promoted with claims that it would improve access to care, particularly for disadvantaged urban and rural patients.

However, technology alone can't bridge the stubbornly persistent divide between medical haves and have-nots, he notes. That requires sustained logistical and financial support from politicians, the medical community and technology companies. ■

— *Karen Nitkin*

Seeking Wisdom from Medicine's Mentors

Growing up in California, **Amol Gupta** remembers countless conversations with his father, a doctor, who had grown up in India as the eldest son in a large family.

“He would tell me: ‘Prioritize wisdom over knowledge. If you need to make an important decision in life, follow your grandfather. I may have knowledge, but he has wisdom.’”

That message made a lasting impact on Gupta, now a second-year resident in the Osler Medical Residency Training program at The Johns Hopkins Hospital. “My father is a board-certified gastroenterologist in the U.S., and my grandfather was a shopkeeper in a small village in India,” says Gupta. “My father helped me start to think about the difference between what I now understand as ‘knowledge and skill set’ vs. ‘wisdom and mindset.’”

Gupta went on to attend medical school in India, primarily, he says, to be close to his grandparents to soak up their wisdom. And he has continued his search for enlightenment with a podcast he launched in 2020, *The Medicine Mentors Podcast*, an interview series on track to hit 1 million downloads by the end

of this year. By interviewing physician leaders from across the country, Gupta aims to tap into their hard-earned wisdom to give medical students and trainees a roadmap “to go from good to great.”

“With *The Medicine Mentors Podcast*, my mission is to democratize wisdom in medicine for physicians in training around the world,” he says. “Mentorship is so engrained in my journey, and this podcast is evidence of the power of virtual mentorship.”

WISDOM BYTES FOR A LARGER AUDIENCE

The idea for the project came to him during medical school, when he kept a diary in his pocket to jot down what he calls “wisdom bytes.”

“If I really admired what a doctor did, I would make a note. It might be the way they led a meeting, or communicated with a patient, or the way they developed a slide for a talk that got a lot of traction with the audience,” he says. “But those wisdom bytes were limited to me. I started thinking about ways to find a larger audience.”

Since the podcast series started during the height of the pandemic, Gupta has interviewed close to 200 leaders in medicine at dozens of top academic medical centers around the United States — from UCSF to Mayo to Harvard. His interview list has included a number of standout physicians at Johns Hopkins,

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Amol Gupta



including **CIM Director David Hellmann**, who spoke with Gupta last fall in an interview titled, “The Magic Carpet of Medicine.”

Gupta says he’s been surprised how easy it’s been to gain access to physicians at the highest levels of the field. “I reach out and say, ‘I would love to learn from you.’ I’ve been amazed by how great the response has been.”

At the end of each 20-minute episode, Gupta summarizes the pearls of wisdom he’s gained during the conversation (“That’s so effective in distilling for me and our listeners the things we can start to change right away”). One of his favorite questions is: “If you were to do your medical training all over again, what’s one thing you would do differently?”

Gupta says that many of the physicians he interviews are years ahead of their peers. “They’ve done incredible things at young ages, and one common theme is the impact mentors have had on their journeys.”

Gupta, with podcast series co-host Kush Gupta, second-year resident at University of Massachusetts–Baystate, has captured many of these high achievers’ insights in a soon-to-be-published book, *Reach Out! Unleash the Power of Mentorship to Achieve Your Peak Potential in Medicine*.

PERSONOMICS PODCAST

Gupta is also working now, with Hellmann and Johns Hopkins cardiologist **Roy Ziegelstein**, the **Sarah Miller Coulson and Frank L. Coulson, Jr., Professor of Medicine**, on a spin-off *Personomics* podcast interview series, which will fall under the umbrella of CIM’s **Initiative for Humanizing Medicine**. It is set to debut in summer 2023.

“Personomics,” a term first coined by Ziegelstein, recognizes that individual patients are not only distinguished by their biological variability but also by their personalities, health beliefs, social support networks, financial resources and more.

“As physicians, we feel responsible for patient outcomes. But outcomes in medicine are not determined solely by the prescriptions we write. Outcomes are a partnership between the prescription and the *implementation* of that prescription,” says Gupta. “That’s why it’s so important to really get to know our patients as people first – to understand their unique situations and mindset – in a very limited time frame, so that we can create a personalized implementation plan that leads to the best outcomes.”

“With this new podcast series,” he says, “I will be interviewing clinician leaders to compile a library of inspiring anecdotes and practical tips for implementing ‘personomics’ in every patient encounter.” ■

Why Precision Medicine Holds Hope for Alzheimer's

When it comes to the potential for helping patients with Alzheimer's disease, a field that for decades has been beset by dashed hopes and disappointments, **Constantine Lyketsos** believes there's real reason for optimism – optimism that rests in research underway now within the Richman Family Precision Medicine Center of Excellence in Alzheimer's Disease at Johns Hopkins, which he leads.

For most of the last two decades, Lyketsos explains, researchers have focused on the “amyloid case” — the belief that Alzheimer's disease is caused by the accumulation of amyloid protein tangles in the brain. A variety of drugs have been developed to diminish those plaques, “and in general, while some of these drugs are pretty good at removing amyloid from the brain, these therapeutics have not been good at improving symptoms,” says Lyketsos, the **Alafouzos CIM Scholar**, who founded and directs the Johns Hopkins Memory and Alzheimer's Treatment Center.

He and other researchers at Johns Hopkins are focused on a precision medicine approach. “Alzheimer's disease and related disorders are not a single disease. We need to take a fresh look and to consider Alzheimer's and related disorders as a series of diseases that each require a different combination of treatments,” says Lyketsos, the Elizabeth Plank Althouse Professor in Alzheimer's Disease Research.



The precision medicine strategy is made possible, in part, by technological advances that allow for the analysis of “big data.” Researchers at the precision medicine center have access to more than 130,000 patient records drawn from patients seen at the Memory and Alzheimer's Center and Johns Hopkins Community Physicians (“under strict oversight,” Lyketsos notes), which they are analyzing to arrive at subgroups of patients who might respond better to different treatments.

One particularly promising area under study homes in on vascular disease in the brain, now widely accepted as a cause for some forms of Alzheimer's disease. Johns Hopkins researchers are using MRI to measure perfusion (how well blood gets distributed within the brain) in test subjects exposed to a “stress test” — in this case, exposure to carbon dioxide. Brain

perfusion is measured before and after the stressor is introduced. “We're finding that people show a range of responses. Some respond ‘properly,’ with blood flow increasing, while others have reduced perfusion,” says Lyketsos. The latter group, he notes, could represent a subgroup of patients who respond well to individualized, targeted therapies aimed at improving brain blood flow.

Paul Rosenberg, co-director of the Memory and Alzheimer's Treatment Center Division of Geriatric Psychiatry and Neuropsychiatry, and his team are testing that idea now in animal models, administering cholesterol-reducing atorvastatin to animals with impaired perfusion. “If we can improve perfusion, perhaps we can improve memory loss,” Lyketsos says.

The ability to study and design therapeutic solutions for individual patients has taken a giant leap forward with advances in stem cell technology. It's now possible, from a single blood sample, for researchers to develop individualized brain cell lines that can then be used in the petri dish to test responses to different drugs or treatments.

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Esther Oh, the **Sarah Miller Coulson CIM/Human Aging Project Scholar**, is doing just that in research examining the role that inflammation plays in the brain since this may be a target of treatments for a subset of patients. In Alzheimer's disease, immune cells in

the brain called microglial cells can get over-activated in some people, producing substances (inflammation) harmful to brain tissue. As part of the Richman Center, Oh collaborates with stem cell engineering expert **Vasiliki Machairaki** from the Department of Genetic Medicine. Machairaki is developing person-specific microglial cell lines to define and differentiate which individuals are more (or less) apt to have “damaging” inflammatory responses in their brains. These individualized microglial lines can also be used as testing platforms to assess the effect of promising medication that can be used to mitigate these inflammatory responses.

Machairaki is using this same approach to develop a wide variety of different brain cell lines relevant to Alzheimer's, all derived from the stem cells of individual people (e.g., neurons, astrocytes). Additional, technological advances pioneered by Machairaki now make it possible to develop 3D culture systems, or “organoids,” that are organized in layers almost as in the native brain. These can include many different types of cells and also serve as models to study subtypes of Alzheimer's.

“Increasingly,” says Lyketsos, “based on the test tube response of 2D and 3D models of an individual's brain cells, we will be able to predict whether individual therapies are likely to be helpful.” These advances will significantly improve the way clinical trials are performed in the future, he notes. That's because a promising drug can first be tested using a patient's cell line, leading to faster selection of a subgroup of patients who are likely to respond positively.

It's vital work, and time is of the essence. Worldwide today, more than 50 million people suffer from dementia, and nearly 10 million new cases are diagnosed every year. These numbers are projected to double by 2050.

“We still have a long way to go,” says Lyketsos, “but by pursuing precision medicine solutions, I am very excited by the prospect of being able to reach the right patient at the right time with the right treatment.” ■

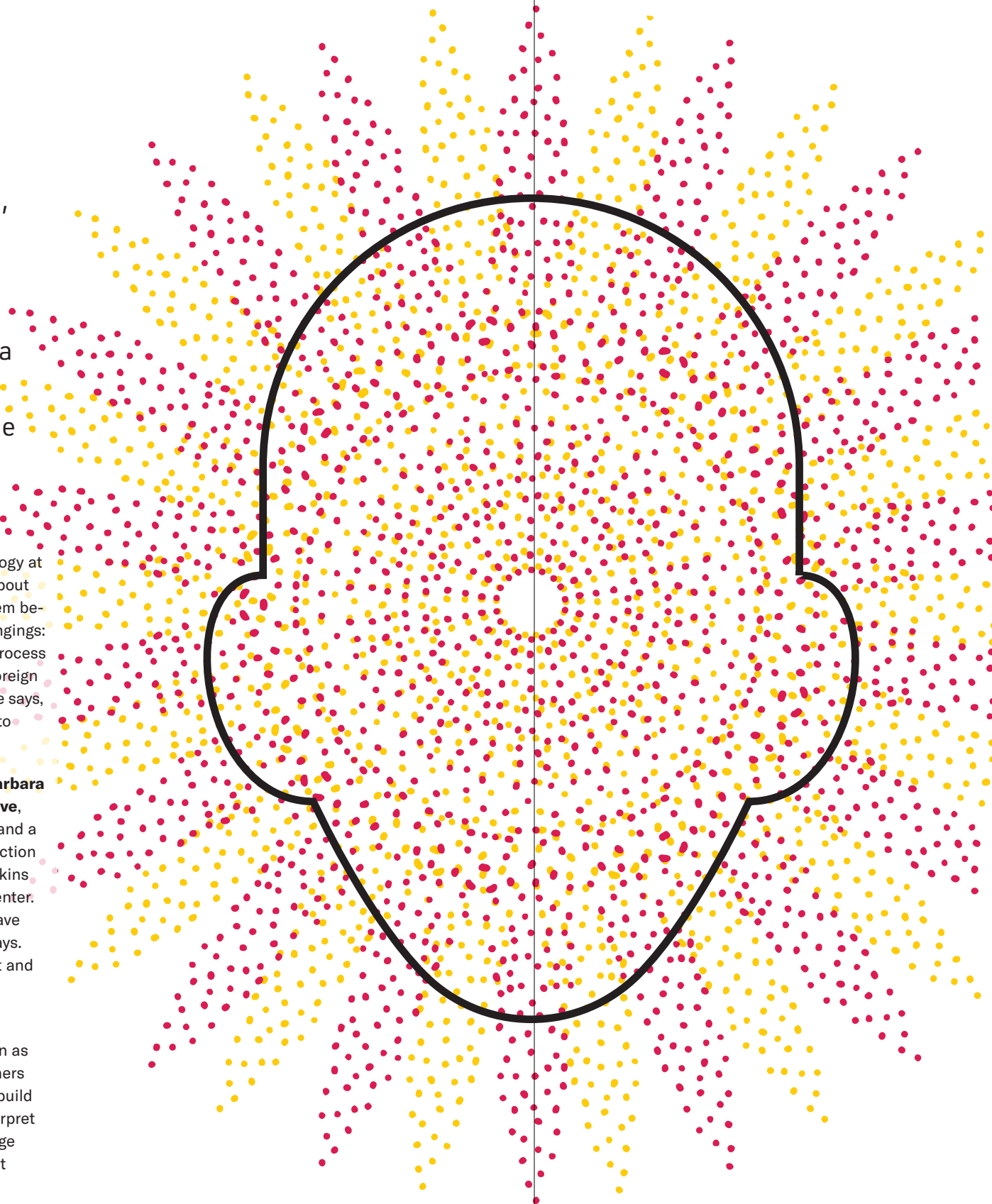
Cultivating Empathy – and a Sense of Wonder

For patients with brain tumors, the route to the radiation room can be anxiety-producing – particularly the first time, when they go to be fitted with a moldable, plastic mesh mask that will anchor their head in the same position each time they receive radiation therapy.

Annie LaVigne, chief resident in radiation oncology at The Johns Hopkins Hospital, has thought a lot about her patients. To lift their mood, she envisions them being greeted along the corridor by unique wall hangings: mesh masks-turned-art projects. “To make the process less anxiety-producing, I want to ground these foreign objects in something familiar to our patients,” she says, “something we share in common that’s unrelated to cancer, like Old Bay and crabs and the Ravens.”

This ongoing project, now funded through the **Barbara and Peter Miller Scholars Personomics Initiative**, began when LaVigne was a fourth-year resident and a scholar in the yearlong Health Humanities distinction track for residents and fellows at The Johns Hopkins Hospital and Johns Hopkins Bayview Medical Center. “In college, I minored in studio art, but I didn’t have much time for it once I started residency,” she says. “The track helped me find my way back to my art and connect it with improving patient care.”

A key pillar of the Health Humanities distinction track is an inquiry-based teaching method known as visual thinking strategies (VTS), which asks learners to observe and discuss visual art. The idea is to build participants’ ability to describe, analyze and interpret imagery and information, and to have them engage in collaborative discussions, which is all aimed at developing critical thinking skills.



At Johns Hopkins Medicine, psychiatrist **Meg Chisolm**, a member of the **Miller Coulson Academy of Clinical Excellence**, is a leading advocate of this approach. She says VTS gave her dramatically new ways of thinking and changed the entire course of her medical career, as she pivoted from directing Johns Hopkins’ Center for Addiction and Pregnancy to become associate director of the Paul McHugh Program for Human Flourishing, whose mission is to help clinicians practice in a more humanistic way.

“What I have come to care about most in life is art museum-based medical education,” says Chisolm, vice chair for education for the Department of Psychiatry and Behavioral Sciences. “I’ve seen its power to cultivate a sense of wonder about oneself and one’s patients, resulting in physicians who are able to deliver more humanized care.”

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Meg Chisolm

As an example of the VTS approach, Chisolm describes a popular class she developed for medical students, called Professional Identity Transformation: An Art Museum-Based Elective.

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She always begins the first class with this prompt: “Pair up. Then, choose a work of art with which to introduce yourself to your partner. After you exchange introductions, introduce your partner to the rest of the class.” Chisolm says the exercise requires students to listen attentively to their partners, and it replaces dry, formulaic introductions with ones like: “This painting reminded me of the old trumpet my father had, which inspired me to learn to play. In college, I ended up being in the marching band, which is where I met my best friend and my husband.”

“These art museum-based methods support skills important to physicians, like observation, communication, critical thinking, tolerance of ambiguity, comfort with uncertainty and personal insight.”

Meg Chisolm

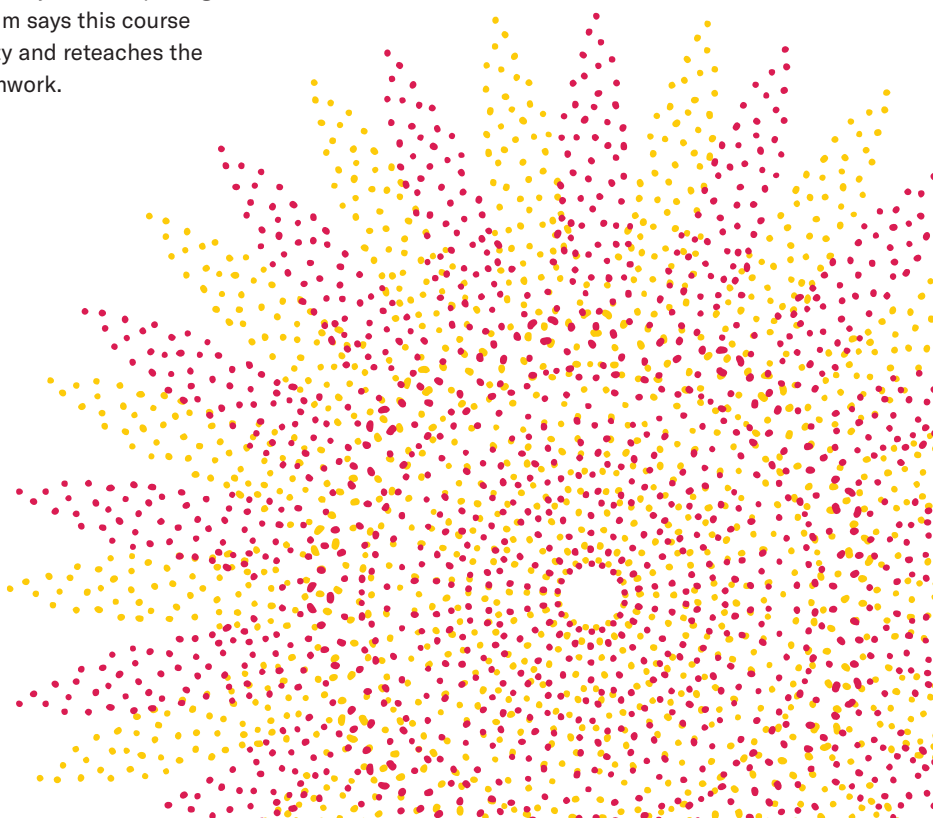
In a field rife with the competitive acquisition of knowledge, where students spend years sharpening their individual acumen, Chisolm says this course increases a sense of community and reteaches the value of collaboration and teamwork.

One former student wrote, “It was amazing how someone else would point out something that I had completely missed in studying the same picture or poem.” And another noted, “Since I was young, I have always been afraid to answer questions in class because I did not want to get them wrong, but this class allowed me to express my thoughts without that kind of fear.”

“These art museum-based methods support skills important to physicians, like observation, communication, critical thinking, tolerance of ambiguity, comfort with uncertainty and personal insight,” says Chisolm, who has used VTS and other arts-based teaching methods with Johns Hopkins pre-health professions students, residents/fellows and faculty members, in addition to medical students.

She’s found the course can also help learners process the strong emotions and stressors that arise during training and medical practice. “The class helped me interrogate my feelings about my career in medicine and about patient experiences I had had,” says fourth-year medical student Diane Jung. “It gave me time and space to reflect on why I wanted to go into medicine and to realize I still had hope and found purpose in my future as a physician.” ■

— Catherine Gara



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