

# INNOVATIONS

## ► in Women's Health

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## Moving Forward

### A Conversation with Dean Nancy J. Brown

Dean Nancy J. Brown, a physician-scientist and the first woman to become dean of the 212-year-old Yale School of Medicine, arrived in February 2020. Since her return to Yale, having graduated from Yale College, Dean Brown has championed efforts to enhance the medical school's research, clinical service, and education.

Woven throughout these efforts is her dedication to a diverse, equitable, and inclusive environment in which all have a sense of being welcome. This is matched by the dean's commitment to health equity, through which everyone's health is optimized. These goals guide the

vision of both Dean Brown and Women's Health Research at Yale. With the support of the school, WHRY advances equity by ensuring that the health of women is studied and differences in health outcomes between and among women and men are a focus of investigation. Aligned with the school's commitment to improving health, WHRY also incorporates research findings into our teaching, shares new health information with the community, and uses emerging data to inform clinical interventions.

In a recent conversation, Dean Brown and WHRY Director Carolyn M. Mazure, PhD, spoke about the

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*Women's Health Research at Yale was founded in 1998 with initial funding from The Patrick and Catherine Weldon Donaghue Medical Research Foundation. Women's Health Research at Yale is a program within Yale School of Medicine. Yale University is a 501(c)(3) nonprofit organization.*

**Moving Forward** (Continued from front cover)

importance of research, the value of a focus on studying women, the influence of biology and social factors that differentially affect the health of women and men, community outreach, diversity, equity, and more.

**Dr. Mazure:** You have spent your professional life in academic medicine and have had the chance to see how academic health centers contribute to the greater good. In your view, what role do academic health centers like Yale School of Medicine play in advancing research to improve the health of our nation?

**Dean Brown:** Academic health centers and schools of medicine are the engines for discovery that drive improvements in health. Our scientists strive to discover new ways to think about pressing health concerns and compete for funding based on the innovation of the proposed research in shedding light on a critical health problem and the potential impact of the findings. In a medical school, clinical observations may inform research, enhancing its impact. Additionally, academic health centers offer the community early access to the application of discoveries into new therapies and diagnostics. Scientists from different fields can cross disciplines and work together to solve problems that cannot be solved by expertise in a single field. In addition, faculty collaborate across laboratory, clinical, and community research to provide multiple platforms for understanding the biological and social mechanisms that promote health and underlie disease.

**Dr. Mazure:** As you know firsthand, for a long time women were largely excluded as study participants, and the health of women was not adequately studied. Do you think this has changed?

**Dean Brown:** We have made great progress in the inclusion of women in research. Women's Health Research at Yale has played a national role over the last two decades and has been rightly recognized for launching new research on women's health, educating students and faculty about the health of women, and advocating for change. Yet, many more areas with regard to the health of women need our attention, and we have made less progress in delving deeply into differences in mechanisms of disease and responses to therapies in men and women. Here WHRY is leading the way by emphasizing the importance of understanding how sex and gender influence biology and behavior.

**Dr. Mazure:** For those who might be less familiar with the current scientific landscape, what would you say are the most urgent health concerns for women that research needs to address?

**Dean Brown:** We need to understand the impact of sex and gender on diseases and conditions that cause significant morbidity and mortality. These include cancer, cardiovascular disease, diabetes and obesity, and disorders in behavioral health. We also need to study reproductive health broadly, for example, in understanding that the health of a mother influences the health of the next generation. In addition, there is much work to be done in studying epigenetic effects – how environment and behaviors affect the way our genes operate. At a place like Yale School of Medicine, where there is so much scientific depth, it is possible to bring together scientists from diverse areas to tackle these issues.

**Dr. Mazure:** As WHRY approaches our 25th anniversary, why do you think it is important to have a center

within Yale School of Medicine focusing on how sex and gender influence health?

**Dean Brown:** Centers such as WHRY serve as a model, a catalyst, and an academic home for the pursuit of knowledge covering a wide area of interests. By bringing investigators together, offering funding and guidance, and involving the community in its vision, WHRY has inspired research questions that might not have been considered. WHRY also contributes essential functions as a conduit for health information to medical and public communities and as a source for mentoring students and junior faculty members so they are prepared for their careers and embrace life-long learning.

**Dr. Mazure:** We know both biology and social factors, such as gender and race, influence health. Is the future of research to study both?

**Dean Brown:** We must study both, and we must rigorously test hypotheses. This requires following questions where they lead us. Too often investigators set out to prove a hypothesis rather than test a hypothesis. We must probe interactions among biological, environmental, and social factors with open minds and eyes for possible differences with significant health impacts. For example, we know that women of color more often give birth to low-birth-weight babies and suffer from higher rates of maternal mortality and that both biological and environmental factors interact to affect these outcomes. In my own area of research, hypertension, we understand that there are important interactions among genetic factors, dietary salt intake, and the production of hormones that increase under stress.



**Dr. Mazure:** Yes, this is a key point. At WHRY we often say that difference does not mean better or worse but that we need — without judgment — to account for how disease can affect people differently. I sense that more people need to hear this message when it comes to studying the influence of biological sex on health. From what you have seen, has studying sex as a biological variable kept pace with studying women in clinical investigations and become an integrated part of institutional research portfolios?

**Dean Brown:** Since the National Institutes of Health (NIH) policy went into effect in 2016 requiring grant recipients to include female vertebrates and study sex as a biological variable, we have seen accelerated progress. Research has already shown how differences between and among women and men affect the risk of various diseases, the prevalence and course of those disorders, and response to treatments. This holds true across a wide variety of diseases and conditions, including cancers, cardiovascular disease, Alzheimer's disease, and more. Again, more work is needed to encourage researchers to study mechanisms of sex differences in the laboratory. We now know that

sex chromosomes affect signaling inside of cells, and cellular pathways are often regulated differently in male and female cells. These data contribute to promising avenues of research that would help us understand the mechanisms of disease and develop better prevention and treatment strategies for both women and men.

**Dr. Mazure:** We talked about translating research for the greater good in a broad sense. Can you comment on the importance of how research can help local communities advance? For example, how important is it for centers like WHRY to collaborate with communities that want to take action to improve health?

**Dean Brown:** As faculty, students, and staff of Yale School of Medicine, we are part of our larger communities of New Haven and Connecticut. It is not enough to advance discovery if we do not also benefit our community as well as the society as a whole. We need to listen to community members as we consider which health research questions we need to answer. We must engage local, state, national, and global partners in clinical trials and research and advance efforts to improve public health by implementing data-based results. I am encouraged by how WHRY is advancing community-based

efforts in partnership with the Yale policy lab Elevate. It is exciting to see our school enabling public-private relationships that fund data-driven interventions and formulate cost-effective health policies to improve the lives of those living in difficult circumstances, especially pregnant and parenting women.

**Dr. Mazure:** The medical school has incorporated language into its mission statement to promote “an inclusive environment enriched by diversity.” You have called for YSM to be a place “where women and underrepresented in medicine (URiM) faculty, staff, and students thrive, and where diversity and excellence are inextricably linked.” What are some of the next steps in building diversity, equity, inclusion, and belonging (DEIB)?

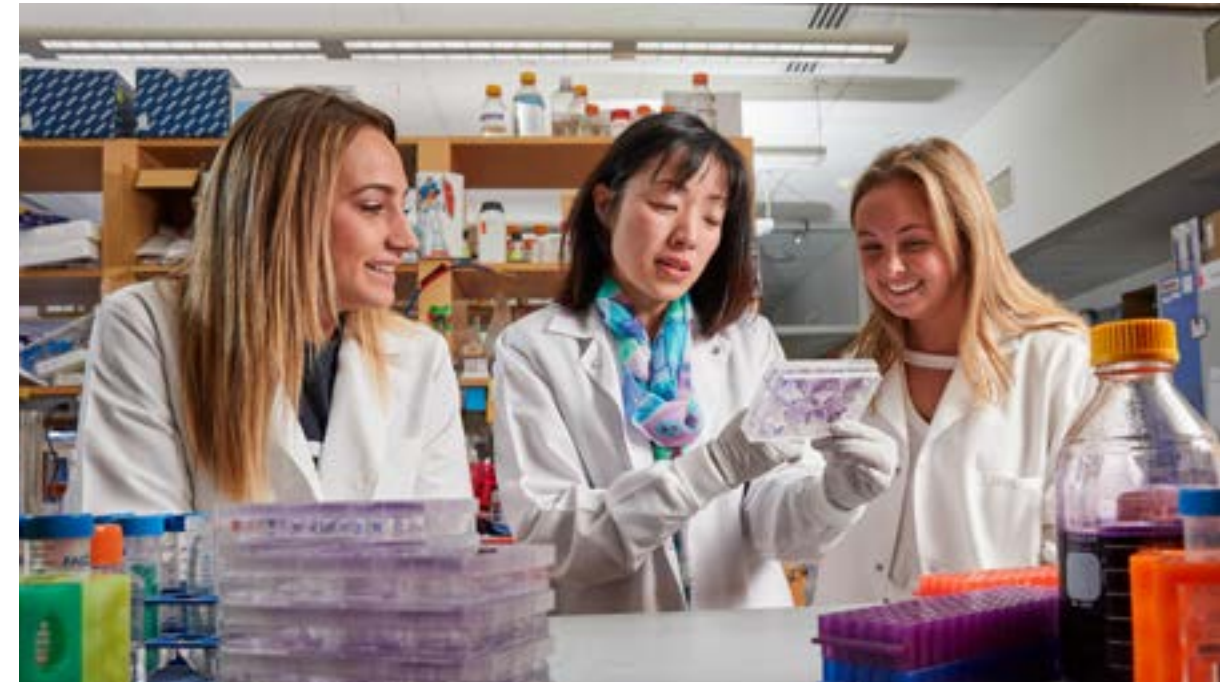
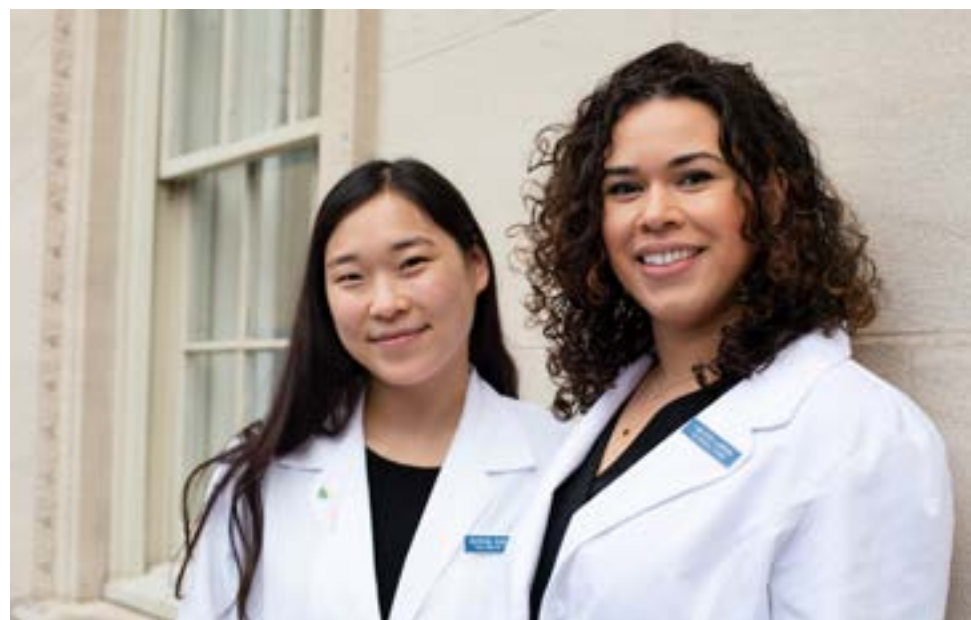
**Dean Brown:** Under the leadership of Dr. Darin Latimore, our deputy dean for diversity and inclusion, the YSM community has been engaged in self-examination and strategic planning. We understand that we must not only focus on recruiting a diverse student body, faculty, and staff but also on mentoring, sponsoring, and promoting those who are here as we continue to build an inclusive community. An important component of our strategic plan is measurement of our progress.

**Dr. Mazure:** How do you see WHRY advancing this work?

**Dean Brown:** Since early on, WHRY aligned with the individuals and groups advancing the tenets of DEIB at Yale School of Medicine. Most recently WHRY has been collaborating with the Office for Health Equity Research under the leadership of Dr. Marcella Nunez-Smith.

**Dr. Mazure:** Thank you Dean Brown for this opportunity to speak with you. ◀

*Former WHRY fellows Suyeon Hong (left) and Haleigh Larson (right) are now medical students at Yale School of Medicine.*



*Efforts by Dr. Akiko Iwasaki (center) to create a nasal spray vaccine that generates an effective immune response to COVID-19 evolved from work first sponsored by Women's Health Research at Yale almost two decades ago. © Robert A. Lisak*

## Priming the Pump WHRY and Akiko Iwasaki Take the Long View on Research

Dr. Akiko Iwasaki understands how persistence and reliance on a sound strategy can pay off years or even decades later.

As one of the world's foremost experts on SARS-CoV-2, the rapidly mutating virus driving the COVID-19 pandemic, Dr. Iwasaki is now leading efforts to create a nasal spray vaccine that generates an effective immune response at the location in which the airborne virus typically enters the body. But this technique, which promises to help tamp down the current crisis and prepare for the next one, did not appear in a flash or by accident. It evolved from deliberate progress based on work first sponsored by Women's Health Research at Yale almost two decades ago.

“That work has given birth to many developments, including this one,” Iwasaki said. “This has been the core hypothesis we have been pursuing over the decades.”

Women's Health Research at Yale awarded funding to Dr. Iwasaki in 2003 and then again in 2013 to develop her “prime and pull” strategy for treating sexually transmitted infections (STIs) at the mucosal site of

infection. This method stimulates the body's immune response and draws disease-fighting cells to the tissues at the location of the infection, where they can provide long-term protection that overcomes a virus' propensity for mutating to avoid detection. Her team continues to advance the STI-fighting strategy based on this method toward a clinical trial and human application, even as much of their attention has shifted toward the current health crisis.

Dr. Iwasaki's experience with treating the mucosal surfaces at the local sources of infection prepared her and her colleagues to design a way to attack respiratory viruses where they are most likely to enter the body: the nostrils. For COVID-19, she has dubbed the method “prime and spike” after the prominent spike proteins the coronavirus uses to penetrate and infect host cells. It also reflects the one-two punch provided by priming with conventional vaccines and, using spike protein, pulling the relevant immune cells to where they are most useful.

In a paper published in December, Dr. Iwasaki's team demonstrated that local vaccines administered with a nasal spray were more effective

at protecting mice from influenza than vaccines injected into muscles. A new study that has not yet been published in a scientific journal shows the effectiveness of “prime and spike” with a nasal spray in a model system to boost immunity from an initial vaccination and provide complete protection from a lethal SARS CoV-2 infection.

*This can become the future of respiratory virus prevention.*

Dr. Iwasaki is hopeful the nasal spray could be approved for human use and adapted to serve as a primary vaccination. By marshalling immune response within the nose — like positioning “a guard outside the door rather than inside,” the technique could prove more effective at preventing the virus from entering the body and causing disease than by eliminating the virus through a systemic response induced through a



“

*We need to understand a lot more about how sex makes a difference in disease prevention and treatment.*

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**Akiko Iwasaki** received her PhD from the University of Toronto and her postdoctoral training from the National Institutes of Health. She joined the Yale faculty in 2000 and currently serves as an Investigator of the Howard Hughes Medical Institute. In February, she was appointed Sterling Professor of Immunobiology and of Molecular, Cellular & Developmental Biology. A Sterling Professorship is considered the highest academic honor a Yale professor can receive.

She is an elected member of the National Academy of Medicine and the National Academy of Sciences. Her research focuses on the mechanisms of immune defense against viruses at the mucosal surfaces.

muscle injection. She also hopes that more people would be willing to take a vaccine through nasal spray than an arm jab.

“This can become the future of respiratory virus prevention,” Iwasaki said. “Either stop the infection or at least control it better at the source.”

WHRY's early support of Dr. Iwasaki's lab and her commitment to the health of women also smoothed the path for WHRY to rapidly approve and fund a study during the early stages of the pandemic. This study established the biological mechanisms through which the immune responses of women and men differed and led to more severe sickness and death for men. This finding received global attention among researchers and health care providers on the front lines of the fight against COVID-19, providing insight into the action of the virus and possible intervention strategies.

“That study and its findings shaped my thinking critically,” Iwasaki said. “We have done dozens and dozens of studies since then where we are taking sex differences into account.”

As a result of this programmatic course of research, Dr. Iwasaki has received funding from the U.S. Food and Drug Administration Office of Women's Health to look at sex differences in the immune response of patients suffering

from long COVID, a constellation of symptoms that can last weeks or months after contracting the illness. Symptoms of long COVID can include fatigue, pain, and brain fog.

“WHRY's funding allowed us to look at the acute phase of this disease,” Iwasaki said. “Now we are looking at the chronic phase.”

Long COVID affects women more than men. The reason for this difference remains unclear, though experts suspect women's generally more active immune system plays a role. While often protecting women from severe disease, the system can sometimes overreact and attack the body, a type of illness known as autoimmune disease that could contribute to long COVID symptoms more often in women.

Dr. Iwasaki said it has been difficult to study sex differences in long COVID because male patients with the disease are harder to find. Such evidence has only solidified her commitment to exploring such differences wherever they can be found.

“I've always been a strong proponent for studying sex as a biological variable,” Iwasaki said. “That has certainly proven important in this pandemic. We need to understand a lot more about how sex makes a difference in disease prevention and treatment.” ◀



## The Brain and the Heart Understanding How to Prevent and Treat Alzheimer's Disease

In the United States, one in three people 65 and older die with Alzheimer's disease or another form of dementia. Today, there are more than 6 million people in the country living with the disease. Experts predict that number will rise to almost 13 million by 2050.

For Dr. Michelle Mielke, these numbers motivate the questions she has devoted her career toward answering. Questions like: Can we predict who will develop Alzheimer's disease (AD) and other dementias? Can we identify biomarkers to predict disease development early? What are the most promising treatment targets?

And importantly, how do sex and gender affect risk factors, symptom onset, and disease progression? In the United States, two-thirds of adults with AD are women, and experts still ponder how much of this gender difference can be attributed to the average longer lifespan of women and how much stems from biological or environmental factors.

“As we have learned with many diseases and conditions, women and men can have different risk factors, different mechanisms underlying disease, and different responses to treatments,” said Mielke, chair of the Department of Epidemiology and Prevention and a professor of epidemiology, gerontology and geriatric medicine, and neurology at Wake Forest University in North Carolina. “We need to continue studying sex-and-gender differences in Alzheimer's disease to uncover what's best for women and men.”

Women's Health Research at Yale Director Carolyn M. Mazure, PhD, invited Dr. Mielke to discuss her research on this topic at a virtual Grand Rounds presentation in April sponsored by the Women's Behavioral Health Division of Yale School of Medicine's Department of Psychiatry.

### Raised Risks for Some Women

Before leaving her faculty position at the Mayo Clinic in March, Dr. Mielke was the senior author of a study published in the journal *Neurology*, finding that the link between cardiovascular conditions, risk factors for cardiovascular disease (CVD), and cognitive decline in mid-life was stronger for women than for men. This was true even though men generally have more heart conditions and cardiovascular risk factors in mid-life, such as high blood pressure, diabetes, and obesity.

“There is still a lot of work to be done about the mechanistic, biological underpinnings of Alzheimer's disease,” Mielke said. “But what our study and prior research are telling us is that what's good for the heart is good for the brain. And this might be even more true for women.”

Reasons for this difference could include the influence of sex hormones on heart health and cognition as well as social differences that often vary between women and men, such as exercise and education. Women are also more likely than men to have types of CVD that decrease small vessel blood flow to the heart without a co-occurring cholesterol blockage in the larger arteries. Such sex differences in the biology underlying CVD might affect cognition differently for women and men.

Dr. Mielke said the data increasingly point toward a need to treat cardiovascular-related conditions early and to more closely follow women with these conditions over time to optimize both heart and brain health. For example, women with preeclampsia, a condition of high blood pressure in pregnancy that can damage organs and threaten the pregnancy and the life of the mother, often have worse cognition in their 60s and 70s.

“If we know that these associations



*Dr. Michelle Mielke found a link between cardiovascular conditions, risk factors for cardiovascular disease, and cognitive decline in mid-life that is stronger for women than men.*

exist between heart health and cognition, even if we do not yet know the precise biological connection, we can follow women with these conditions more closely,” she said. “And see if by treating their cardiovascular disease, maybe the cognitive issues can be prevented.”

### The Role of Hormones

Similarly, Dr. Mielke's team has demonstrated how the surgical removal of a woman's ovaries — and thus the hormones they produce — before natural menopause is associated with poorer cognition and dementia. She cautioned against the unnecessary removal of ovaries for women without ovarian cancer or who are not at high risk of developing the disease. She also pointed to a larger lesson about how to perceive hormonal fluctuations across the lifespan.

“Some have said that menopause is a risk factor for dementia, but I don't believe that is correct,” she said.



“All cisgender women go through menopause. To blame menopause would be like saying puberty is a risk factor for heart disease.”

Instead, Mielke likens menopause to a “stress test” in which evidence is starting to show that women with more severe menopause symptoms, such as intense hot flashes, are more susceptible to developing cardiovascular disease and potentially at a higher risk for AD or vascular dementia.

### Screening for Signs

Mielke's work also focuses on identifying blood-based biomarkers for AD that can aid diagnosis through primary care as opposed to the more expensive, harder-to-access visits to specialists with more expensive tests, such as neuroimaging or a lumbar puncture.

At the same time, Mielke wants medical providers to understand how such a test could be effectively utilized in the general population, particularly as other diseases and conditions might affect the levels of certain biomarkers and how to interpret the results.

For example, experts have long focused on proteins called beta-amyloids that can collect between brain cells and form plaques that disrupt brain function. Another target protein called tau can form tangles inside neurons that prevent proper communication

between the cells. Although previously not feasible, with new technology beta-amyloids and tau can now be measured in the blood. However, recent evidence suggests that people with chronic kidney disease have higher levels of beta-amyloids and tau than people without kidney disease, even though they do not appear to have a greater risk for AD. Similarly, other groups of people develop high levels of these blood markers but no symptoms of cognitive dysfunction.

In addition, if an accurate predictor of AD were to be established, Mielke stressed the importance of understanding how to present the results of such a test given the implications of a positive biomarker. For example, how might this new knowledge affect an individual's mental health or their ability to obtain life insurance?

“It would be phenomenal if we could eventually develop an effective method for screening potential susceptibility to Alzheimer's disease, as this could lead to possible preventive strategies,” she said. “But, in any event, we would definitely need to educate health care providers about the meaning of a positive biomarker, so they understand how to discuss with patients what this means.”

### Beyond Biology

Research has identified differences

in the way Alzheimer's disease affects the brains of women and men. For example, the women who develop AD experience higher neurodegeneration, a condition in which brain cells become damaged or die at accelerating rates. Dr. Mielke also stresses the importance of discussing how environment and experience filtered through gender contribute to disease.

A 2019 study from UCLA found that mothers between the ages of 60 and 70 who never participated in the wage-base labor force showed far more rapid declines in memory than women who worked. This was true for married women and single women who experienced a prolonged period without paid employment.

The authors suggested that mental stimulation and financial and social benefits could have contributed to the observed difference. With such factors in mind, Dr. Mielke has helped form a group on sex and gender at the Alzheimer's Association to take a global perspective on whether and how sociocultural factors contribute to the disease.

“We have had so many changes in society over the last 50 years,” Mielke said. “It's important to understand what effect these social transitions might have, so we can better protect people from this disease.” ◀

## WHRY Leading the Way

With a grant from WHRY, Dr. Le Zhang and Dr. Stephen Strittmatter, chair of the Department of Neuroscience and director of the Yale Alzheimer's Disease Research Center (ADRC), studied, for the first time, sex specific differences in the origins of Alzheimer's disease by examining individual brain cells.

By using techniques that allow them to focus on intracellular activity, Drs. Zhang and Strittmatter found subtle differences among cell populations gathered from women and men with and without Alzheimer's disease

and uncovered biological information about what may cause pathological changes in brain cells. The techniques used, collectively called “single-cell analysis,” generate tremendous amounts of genetic data that offer opportunities to learn how different cell types and processes interact within the cell to cause disease.

WHRY then shared with Dr. Strittmatter the findings from another WHRY-funded investigator, Dr. Hongyu Zhao, who was also pursuing genetic underpinnings for AD. With WHRY funding, Dr. Zhao

deployed his own novel analytical techniques to a large collection of health data and discovered evidence of genetic sex differences in the disease. Combining their expertise to understand genetic risk and advance therapeutic drug response in AD, Drs. Strittmatter and Zhao initiated a collaboration that resulted in a grant from the National Institutes of Health. In addition, Dr. Strittmatter's colleague on WHRY's pilot project, Dr. Le Zhang, has received funding from the Alzheimer's Disease Research Center to continue her work with Dr. Zhao as a mentor.

## Lessons and Plans for Women's Health with WHRY's Council Chair



Susanna Krentz, Yale Class of '80, joined the WHRY Advisory Council in 2016.

treatments. In this way, people and their health care providers will be better equipped to make informed decisions. Importantly, this will help women – who have historically not had the same benefit of health research as men – but also men, who benefit as well from the discovery of sex-and-gender influences on health.

### What do you hope the WHRY Advisory Council can achieve in the coming years?

I would like to see the council continue to attract diverse, talented volunteers committed to improving the health of women. My amazing predecessor as chair, Carol Ross, has made this such an inviting, thoughtful, and respectful place to conduct our work. In particular, I am eager to continue implementing the work of our Diversity, Equity, Inclusion, and Belonging Committee, headed by Patricia Brett and Diane Young Turner. Mostly, I want to continue cultivating a council that helps solidify the future of the center so it can make an even bigger impact on medical research and practice.

### Why do people need to support WHRY?

WHRY relies on individual and foundation support to conduct the research we need to improve our health. The center also brings together experts from different fields so they can build on each other's work, shares the latest research findings with the public and medical community, mentors students and junior faculty members, and helps shape public health policy. As we approach our 25th anniversary, WHRY is doing more than ever. Without donor support, it will not get done. ◀

Susanna Krentz joined the Women's Health Research at Yale Advisory Council in 2016, offering her decades of expertise advising health care organizations on strategy and financial analysis. A graduate of the Yale Class of '80, Krentz has served as chair of the Yale Alumni Association Board of Governors and received The Yale Medal in 2010 for her outstanding individual service to the university.

Krentz became the newest chair of WHRY's council in January. We spoke to her about what she has learned since joining the center and what she hopes we can accomplish in the years ahead.

### How has the COVID-19 pandemic shaped your views on the importance of medical research?

For me, it has reinforced the miracle of science. It boggles the mind how researchers around the world could so quickly develop and deploy the vaccines we now have to fight this disease. But I am not sure how much the public is aware of how research is conducted and how scientists at centers like WHRY need to play the long game and prepare for threats before they become a public health emergency. Research needs to balance working to

address current and emerging health problems, which can get overlooked when the world focuses on a single, overwhelming health crisis.

### What do you think people need to understand more about how science is conducted?

I think a lot of people don't realize that a lot of science is dynamic and what you learn can change conclusions over time. For example, people have expressed confusion over some of the shifting guidance about how to protect the public from COVID-19. I understand this confusion, but that's the nature of science. When you get new data, conclusions may change. That's the challenge we have in communicating scientific information. People want to know the final answer when the current answer is always just the best answer available with the information we have at the moment.

### What role does Women's Health Research at Yale play in improving science to better protect public health?

We are changing science to be sure that women are studied and that lessons about sex-and-gender differences are investigated and applied to health



## Studying Small Differences Can Have Large Benefits By Rick Harrison

Can we talk?

As we navigate the current conversations about sex and gender in society and science, I feel like we need to lower the heat a bit. We could all try to connect more effectively with people who might not immediately see things our way. We need to listen, embrace compassion, and instill trust.

I reach for these principles when reacting to headlines and opinion pieces that – intentionally or otherwise – can misrepresent or muddle something as basic as the importance of studying differences between and among women and men that affect health and disease.

For example, someone might ask, “Why point out our differences, when we are so much the same?” In silent response, I find myself wondering why we would ignore the significant differences that do exist or refuse to look for others, even if they are subtle or outnumbered by so many similarities.

But with an open mind, it is not hard to understand the source of such concerns. Differences have historically been used to control and marginalize

groups of people, often based on superficial or made-up categories. Racism and misogyny continue to inflict real pain across the world and inhibit humanity’s capacity to thrive.

So how can we answer a legitimate question about the need to research how our differences might affect health? Maybe like this:

Differences that affect health and well-being, established through sensitively conducted peer-reviewed research, are not value judgments about character. They are not measurements to obstruct fairness and an equal opportunity to succeed. They are pieces of data with potentially significant utility for improving health and, consequently, enhancing fairness and an equal opportunity to succeed.

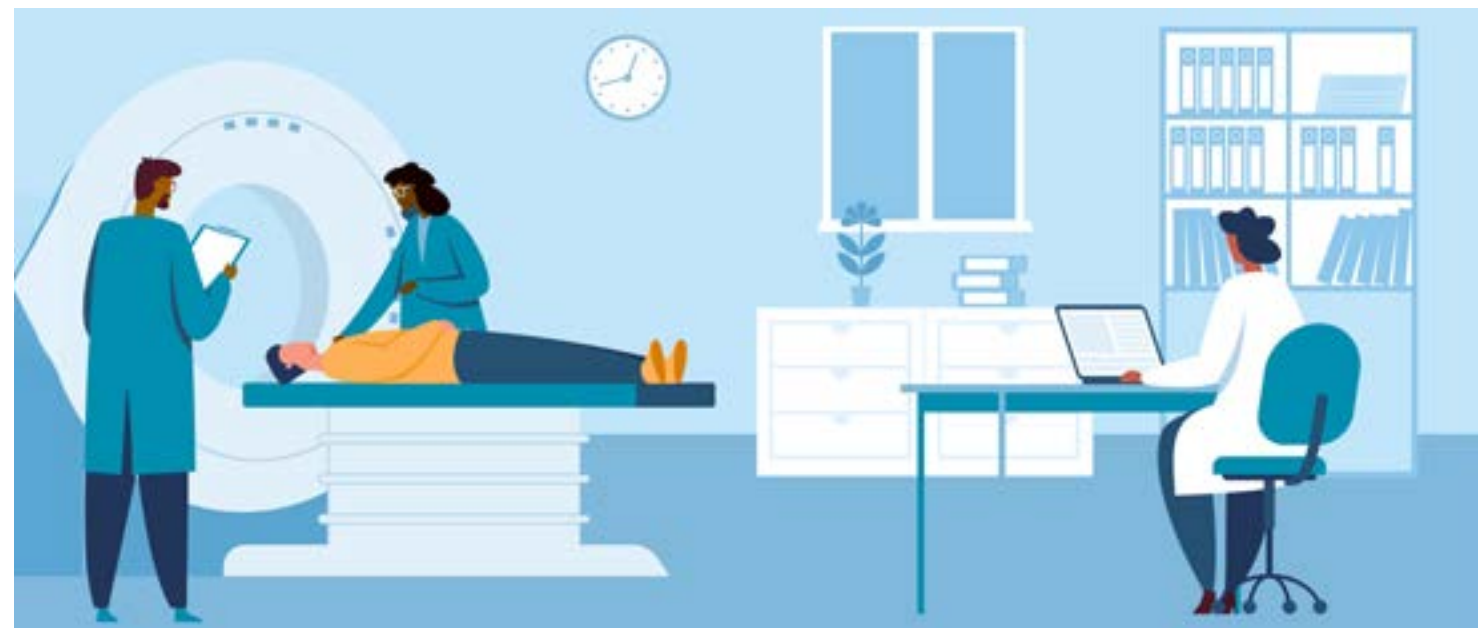
At Women’s Health Research at Yale, we are changing science to study the influence of sex, gender, race, and ethnicity on health so we may learn the best path for everyone’s individual, optimally targeted health needs.

Research has established that biological differences exist between individuals and groups of people based on their genes and how genes express



themselves throughout life. Similarly, social constructions like gender, race, and the shared culture of ethnicity can affect how people are treated, and this treatment can in turn affect health outcomes.

Too often, well-intentioned people can talk past each other. Before we talk, it’s good to listen and be respectful. Better medical research and practice, as advanced by WHRY, will incorporate the consequential differences between and among us to improve everyone’s lives. But only if we look for them and listen to what they are telling us about ourselves. ◀



## Let’s Make Some News (and a Better Future) by Supporting Women’s Health Research



Have you have seen any of these headlines?

*“Health-Related Quality of Life Varies Between Men, Women with Advanced Kidney Disease”*

*“Sex Differences in Smoking Risk Following Heart Attack”*

*“Cervical Cancer Kills Black Women at a Disproportionately Higher Rate Than Whites”*

These recent headlines have in common the fact that health disparities – inequities is the better term – continue to compromise and even determine health outcomes for many. They remind us that women continue to be at elevated risk for many diseases and conditions and that, often, women of color are at even higher risk for adverse health outcomes.

But these stories, for me, summon resolve and hope for the future. Because, after decades in which research too often did not include women or failed to consider sex-and-gender differences, we are starting to make real progress. We now know about the significant ways in which sex – as a biological variable – and gender, race, and ethnicity – as social variables – affect health. And more investigators are following the lead

blazed by Women’s Health Research at Yale nearly 25 years ago.

We cannot turn back. And to ensure that we maintain and accelerate this progress, we need your help.

WHRY relies on the generosity of people like you to invest in the health of women. Your donations allow WHRY to fund essential studies on women and sex-and-gender differences in health. Each year, WHRY assembles committees comprised of leading medical practitioners and researchers whose job it is to evaluate and recommend for funding studies from among dozens of competitive applications.

The process continues beyond the initial research, as WHRY staff work with the researchers to hone their methods and leverage their results to secure larger external grants. Over the years, WHRY researchers have taken their data and used it to generate 20 times more funding than the initial WHRY pilot grant.

These scientists then invest in their labs and clinical research settings, establishing research programs dedicated to solving the practical health problems women continue to face.

The center also brings experts together across disciplines so that their combined skills and experience can examine and address complex and difficult health problems, from cancer and cardiovascular disease to Alzheimer’s disease and mental health disorders.

Importantly, WHRY finds new and innovative ways to share the results of its studies – and those of others – with the public and the medical community. The result

is that the base of knowledge guiding medical care continues to expand.

The center also has made strides in refocusing the content of what is taught in medical school. The objective here is to enable students to understand the latest findings on sex and gender as they embark on their careers and influence their colleagues. Through mentoring efforts, WHRY directly teaches students and junior faculty members to lead the next generation of researchers and health care providers in inclusive science and medicine.

WHRY has also joined with the Yale School of Public Health’s policy lab Elevate in order to provide data-based solutions, in collaboration with our communities, that assist women and families in difficult circumstances and help women advance their lives to end the cycle of poverty.

With your support, these efforts will write tomorrow’s headlines. ◀

Sincerely,

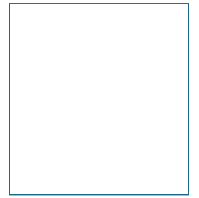
*Barbara*

Barbara M. Riley  
Philanthropy Chair



# Women's Health Research at Yale

► Better science, better lives ► ►



Women's Health Research at Yale is changing the landscape of medical research and practice by ensuring the study of women and examining health differences between and among women and men to improve the lives of everyone.

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