

ALL IN THEIR HEADS

When Faces Made the Case for Lobotomy

BY CARLA GARNETT

If you were mentally ill back in the late 1930s to late 1950s, doctors might have tried to cure you by drilling a hole in your brain and disconnecting the thalamus from the frontal lobe. They may have been convinced to employ this drastic surgery by eccentric neuroscientist Dr. Walter Freeman, “the world’s greatest proponent and pioneer of lobotomy,” who used portraits as scientific proof of concept.

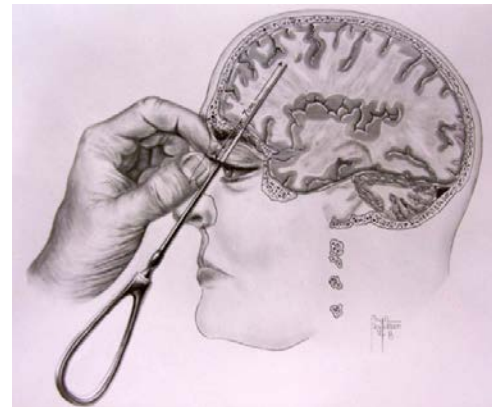
Why did the medical community back then accept what seems preposterous to us now?

That was the fascinating question in

“Scientists’ Mind-Body Problems: Lobotomy, Science and the Digital Humanities,” the 2019 NLM James Cassidy Lecture in the History of Medicine delivered Sept. 19 by Dr. Miriam Posner, assistant professor in the information studies department at UCLA.

“This whole lecture is the story of different modes of proof coming in and out of fashion,” she said. “We find ourselves now in a time when data and statistics claim an enormous amount of cultural authority. One of the central questions of digital humanities is, what can statistics capture and what kind of meaning eludes these methods?”

In the mid-20th century, lobotomies were commonly practiced “on tens of thousands of mentally ill people,” Posner pointed out. “We now think of lobotomy as an atrocity and rightfully so, but it’s also important to understand how a lot of very smart, educated people could have believed otherwise during the procedure’s prime.”



A drawing from Dr. Walter Freeman’s book, *Psychosurgery in the Treatment of Mental Disorders and Intractable Pain*, shows his icepick-inspired transorbital lobotomy instrument.

Posner was compelled to examine the surgery’s history, and Freeman’s career, by a photo—and then more photos and old

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THE BIGGER PICTURE

Charon Espouses Power of Narrative Medicine

BY DANA TALESNIK



Dr. Rita Charon

Everyone has a story to tell. We seek compassion. We want to be heard.

Dr. Rita Charon has pioneered a whole movement around this idea, encouraging the medical community to think beyond their checklists of symptoms and embrace patient narratives. Actively listening to and empathizing with patients, she believes, can improve health outcomes.

SEE **CHARON**, PAGE 4

NCCIH Celebrates 20th Anniversary

BY ELLEN O'DONNELL



Dr. Helene Langevin

An anniversary—especially a milestone one—invites us to reflect on the past, examine the present and envision the future.

NCCIH staff, a group of researchers and a public audience did just that at the center’s 20th anniversary symposium, “NCCIH at 20: A Catalyst for Integrative Health Research,” held recently in Lipsett Amphitheater.

“I think it’s fair to say that at 20 years old, NCCIH has proven itself to be an incredibly

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Film depicts active-shooter training; see p. 12.

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NLM Lecture on Informatics, Nov. 13

The next talk in the NLM Informatics and Data Science Lecture Series is "Informatics for Genomics-informed Surveillance of RNA Viruses," to be given by Dr. Matthew Scotch on Wednesday, Nov. 13 at 2 p.m. in Lister Hill Auditorium, Bldg. 38A.



Dr. Matthew Scotch

Genomics-informed surveillance is now recognized as an important extension to the monitoring of rapidly evolving pathogens. Next-generation sequencing has the ability to produce large amounts of data for tracking viruses of public health importance. Biomedical informatics approaches can facilitate the

translation of these data into information for public health surveillance.

Scotch is associate professor of biomedical informatics at Arizona State University and assistant director of ASU's Biodesign Center for Environmental Health Engineering. His work lies at the intersection of bioinformatics and public health informatics and focuses on the theory and application of genomics-informed public health surveillance of RNA viruses.

The talk will be broadcast live and archived at <http://videocast.nih.gov/>.

Individuals who need reasonable accommodation to participate should contact Ebony Hughes, (301) 451-8038, Ebony.Hughes@nih.gov or the Federal Relay (1-800-877-8339).

NIDCR Holds Sjögren's Grand Rounds, Nov. 15 in Lipsett Amphitheater

The National Institute of Dental and Craniofacial Research will host a special grand rounds to mark the genesis of its Sjögren's Syndrome Clinic, a bench-to-bedside program bringing basic and pre-clinical scientific discoveries to the clinical setting. "Celebrating 35 Years of Sjögren's Syndrome Research at NIH" will be held Friday, Nov. 15 from 10 to 11:30 a.m. in Lipsett Amphitheater, Bldg. 10.

In 1984, a Sjögren's syndrome clinical protocol led by NIDCR investigator Dr. Bruce Baum launched the clinic's establishment. Speakers will trace the past, present and future of research on this systemic autoimmune condition, which commonly causes dry mouth and dry eyes and affects up to 4 million people in the United States.

Dry mouth is caused by decreased functioning of the salivary glands and interferes with taste, makes chewing and swallowing more difficult and increases the risk for cavities, tooth loss and oral infections. Featured speakers include Baum, now

NIDCR scientist emeritus, who developed the first-ever salivary gland gene therapy tried in humans; Steven Taylor, chief executive officer, Sjögren's Syndrome Foundation; Dr. Caroline Shiboski, professor and chair, department of orofacial sciences, University of California, San Francisco, School of Dentistry; and NIDCR assistant clinical investigator Dr. Blake Warner.

The event will be followed by a reception on the FAES terrace. Individuals who need sign language interpreting and/or other reasonable accommodation to participate should contact Chalante Davis at Chalante.Davis@nih.gov and (301) 827-1093, or the Federal Relay at 1-800-877-8339. Requests should be made at least 5 days before the event.

NIH Community College Day, Nov. 26

The Office of Intramural Training & Education will hold NIH Community College Day on Tuesday, Nov. 26 from 8 a.m. to 4 p.m. at Natcher Conference Center. The all-day event will provide community college students and faculty an opportunity to visit the NIH campus and learn about careers and training opportunities in biomedical and health care fields. To register and for more information visit www.training.nih.gov/communitycollegeday.

NIH Offers First Research Project Grant on Sex, Gender

NIH recently released a funding opportunity announcement (FOA) titled The Intersection of Sex and Gender Influences on Health and Disease for research project grant (RO1) applications. The ORWH FOA encourages research across many scientific disciplines to examine how sex and gender factors intersect with health and disease.

In the last decade, there has been growing recognition that disease prevalence, course and outcomes in women and men are influenced by both biologic sex and gender. Research suggests that some diseases are unique to women; some

are more common in women than in men; and some are characterized by different disease courses in women than in men. The FOA seeks research that will expand the current understanding of the sex and gender factors that drive these crucial differences.

First-round applications are due Nov. 25. Due dates for subsequent rounds of applications are Nov. 25, 2020, and Nov. 26, 2021.

Webinar on Decision-Making in mHealth Features Dempsey, Nov. 5

The Office of Disease Prevention will hold a Methods: Mind the Gap webinar with Dr. Walter Dempsey on Tuesday, Nov. 5 at 11 a.m.



Dr. Walter Dempsey

Dempsey, an assistant professor of biostatistics at the University of Michigan, will focus on mobile health (mHealth) studies in which both longitudinal and time-to-event data are recorded per participant. He will discuss how models enter into various stages of the intervention

development process.

Registration is required at <https://www.prevention.nih.gov/education-training/methods-mind-gap/joint-models-longitudinal-and-time-event-data-informing-multi-stage-decision-making-mhealth>. The webinar will be recorded and available on the ODP website within about a week.

Sexual & Gender Minority Research Awards

The Sexual & Gender Minority Research Office held the second annual NIH Sexual & Gender Minority Research Investigator Awards Program in Wilson Hall on Sept. 17. Three awardees presented on their research and answered questions from the audience. At right (from l) office director Dr. Karen Parker welcomes honorees Dr. Karen Fredriksen-Goldsen of the University of Washington School of Social Work, Dr. Lindsay Taliaferro of the University of Central Florida and Dr. Katie Biello of Brown University School of Public Health. Their lectures highlighted research on health disparities faced by sexual and gender minority populations. To see the event, visit <https://videocast.nih.gov/summary.asp?live=34691>.



NIH Hosts International Summit in Genetics, Genomics

BY KATHRYN DEMOTT

“Life-changing” and “career-enhancing” were phrases this year’s 34 fellows used to describe their experience at the 2019 NIH International Summit in Human Genetics and Genomics, coordinated by the National Human Genome Research Institute.

Since 2016, the month-long annual summit has sponsored fellows from low- and middle-income nations to visit the NIH campus to expand their knowledge of human genetics and genomics. At this year’s summit in September, fellows hailed from 24 countries including, for the first time, Democratic Republic of the Congo, Ecuador, Eritrea, Mali, Mongolia, Myanmar, Romania, Sudan and Vietnam. Participants included scientists, clinicians, research physicians and dentists, counselors, a nurse and a clinical psychologist.

The trans-NIH initiative had support from 14 other NIH institutes and centers and the Foundation for the NIH. The National Eye Institute hosted five fellows in ophthalmic genetics, representing the largest proportion of the group.

The robust curriculum featured presentations by more than 70 speakers; hands-on workshops on topics such as grant-writing

and bioinformatics; field trips to academic and commercial institutions, such as Johns Hopkins University and GeneDX; mentored training; and networking opportunities.

Many fellows involved in genetics research in their home countries sought expertise on their projects.

Henrietta Ifechukwude Monye, an ophthalmology resident at the University College Hospital of Ibadan, Nigeria, studies the perceptions about genetic testing among parents of children diagnosed with genetic eye disease. She noted that the summit empowered her to raise awareness about the potential benefits of genetic testing. “It was also a great opportunity to interact and network, literally, with the world,” she said.

Dr. Kudakwashe Mhandire, an HIV genetics researcher at the University of Zimbabwe, said that the summit experience gave him perspective on genetic practices that could be feasible and sustainable in resource-poor settings, such as Africa.

Dr. Norita Binti Hussein, a primary care clinician at the University of Malaya in Kuala Lumpur, credited the summit with helping her build leadership skills to help develop a team to promote genetics and genomics education in primary care.

The summit creates momentum to integrate genetics and genomics in research and medicine through international cooperation and collaborations, according to NHGRI’s Manjit Kaur, the program’s

administrator. Collectively, in just this past year, the 2016–2018 fellows have published 177 manuscripts in their fields of expertise, involving genetics. In addition, 53 have written or received grants from NIH or other funding institutions and many have established collaborations and initiated new research projects.

The summit is in popular demand, with numerous requests from participants for its continuation, according to Kaur.

“For its final year in 2020, we hope we have the necessary support to host up to 40 candidates,” she said.

The deadline for applications is Nov. 29. For more information visit <https://youtu.be/XLbxHa4vw3g>. **R**



ON THE COVER: Biologist James Balow Jr. inserts a GeneChip into the GeneChip fluidics station to analyze RNA from patient samples in order to identify genes that are differently expressed between patients with autoimmune diseases and controls.

IMAGE: RHODA BAER, NIAMS

The NIH Record

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This year’s 34 fellows were from 24 countries including, for the first time, Democratic Republic of the Congo, Ecuador, Eritrea, Mali, Mongolia, Myanmar, Romania, Sudan and Vietnam.

PHOTO: ERNESTO DEL AGUILA

NIH National Institutes of Health
Turning Discovery Into Health

Charon

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Charon is professor and chair, department of medical humanities and ethics and professor of medicine at Columbia University, where she launched the first narrative medicine program nearly 20 years ago. She spoke at the second annual Howard Gadlin Lecture on Sept. 24 in Masur Auditorium, delivering a presentation filled with art and culture.

Most of her slides contained no words, just images, often of a famous painting, to illustrate her message. Charon showed, for example, the 19th-century painting *Violet and Silver – The Deep Sea* by James Whistler, who painted it while on a boat. Rocking on the sea, she said, he was conveying his reality at that time—the ever-changing wispy clouds, the sea’s whitecaps—which are never identical from one moment to the next.

Often, doctors miss the boat entirely, too consumed with data entry, their eyes glued to the monitor, to give patients the time and attention they deserve, Charon contends.

“Patients have critical information to share with us about their illnesses and somehow we lack the means to harvest it,” she said. “In practice, the checklists and the online portals have really taken the place of authentic conversation.”

Sometimes there’s a story hidden beneath the surface, waiting to be unearthed. Charon displayed a 16th-century painting by Dutch artist Pieter Bruegel. It’s bustling with activity: a shepherd with his flock, a fisherman, ships, a castle and mountains in the distance. Only when we learn the painting’s title, *Landscape with the Fall of Icarus*, do we notice the figure from Greek mythology kicking his legs in the sea.

“What would it take for medicine and science to listen,” asked Charon, “for our physicians and investigators not to turn away from the disaster of illness and the suffering it confers?”

Charon beckons doctors to face the face of the patient, moving from the larger landscape to that of the individual, not only looking at the impersonal medical chart, but also listening to the personal story.

In health care, even before the advent of the latest technologies,

“Patients have critical information to share with us about their illnesses and somehow we lack the means to harvest it.”

—DR. RITA CHARON

doctors sometimes faced ridicule for focusing on individual patients. Doctors typically would preface their observations with, “at the risk of sounding anecdotal,” she recounted. Now, though, times are changing with the vision and rise of precision medicine.

“The more we have come to understand the human genome and all the biological controls that go into our organism’s responses to injury or disease,” she said, “the more we can really concentrate on each individual who has that disease, and concentrate and select with such wisdom the treatment that will best help that individual.”

And, in treating the individual, each narrative is powerful. NIH director Dr. Francis Collins, in his introduction, said conversations with patients have long been a driving force in his research.

“Stories are much more compelling, perhaps, than reeling off a list of grant mechanisms or particular principles that we’re trying to understand,” said Collins. “It’s stories that drive us; it’s stories that we’re wired to respond to.”

Dr. Howard Gadlin, the lecture’s namesake, also knew a thing or two about

the power of narrative in his distinguished career, having served as NIH ombudsman for 17 years before retiring in 2015.

Narrative medicine, which developed into a master’s program at Columbia and has evolved into an international movement, can be a model for compassionate health care that strengthens the doctor-patient bond, said Charon.

“How many questionnaires and checklists would you have to give each patient,” she asked, “to learn efficiently and comprehensively about his or her medical condition, health fears, sense of the world, beliefs about how our body works, characterological build, sense of how to face adversity, resilience, capacity to change and enter a trusting relationship?”

Instead of using questionnaires and checklists, Charon learned to say to each new patient, “I will be your doctor, so I need to know a great deal about your body and your health and your life. Please tell me what you think I should know about your situation.” And patients would tell her what she needed to know.

But there’s a skill to extrapolating the intricacies of narratives.



LAUREATES

Grantees Share 2019 Nobel Prizes

Four NIH grantees won Nobel Prizes last month, including two who shared the prize for physiology or medicine and two who shared the economics prize.

The 2019 Nobel Prize in physiology or medicine went to grantees Dr. Gregg Semenza of Johns Hopkins University and Dr. William Kaelin, Jr. of Dana-Farber Cancer Institute. They shared the prize with Sir Peter Ratcliffe of the University of Oxford, England, and Francis Crick Institute, London, for their discoveries of how cells sense and adapt to oxygen availability.



Dr. Gregg Semenza

PHOTO: JOHNS HOPKINS UNIVERSITY



Dr. William Kaelin, Jr.

PHOTO: CHIA-CHI CHARLIE CHANG

The Royal Swedish Academy of Sciences said, “The seminal discoveries by this year’s Nobel laureates [in medicine] revealed the mechanism for one of life’s most essential adaptive processes. They established the basis for our understanding of how oxygen levels affect cellular metabolism and physiological function. Their discoveries have also paved the way for promising new strategies to fight anemia, cancer and many other diseases.”

Kaelin has received continuous funding since 1990, totaling more than \$30 million from the National Cancer Institute.

Semenza has received funding from NIH since 1988, totaling more than \$20.3 million, primarily from the National Heart, Lung, and Blood Institute and the National Institute of Diabetes and Digestive and Kidney Diseases.

The 2019 Nobel Prize in economic sciences went to grantees Dr. Esther Duflo of the Massachusetts Institute of Technology and Dr. Michael Kremer of Harvard University. They shared the prize with Dr. Abhijit Banerjee of MIT “for their experimental approach to alleviating global poverty.”

The Royal Swedish Academy of Sciences noted, “This year’s laureates have introduced a new approach to obtaining reliable answers about the best ways to fight global poverty. In brief, it involves dividing this issue into smaller, more manageable, questions—for example, the most effective interventions for improving educational outcomes or child health. They have shown that these smaller, more precise, questions are often best answered via carefully designed experiments among the people who are most affected.”



Dr. Esther Duflo

PHOTO: BRYCE VICKMARK/MIT



Dr. Michael Kremer

PHOTO: STEPHANIE MITCHELL/HARVARD UNIVERSITY

Duflo has received continuous funding since 2001, totaling more than \$10 million, from the National Institute on Aging and the National Institute of Child Health and Human Development.

Kremer received modest funding early in his career from NICHD, totaling about \$550,000.



Charon takes questions as NIH director Dr. Francis Collins looks on.

“You have to have learned how to listen to an autobiography,” said Charon. “You need to listen for the tempo changes, the metaphors used, the spaces described, to really listen for the unsaid.”

And, what’s actually happened usually differs from how the story is told. Narrative includes causality, intention, motive, emotion, imagination and ideology, Charon said. Each telling generates a new story. The medical student won’t hear the same story the attending physician hears.

Stories help doctors understand the illness by providing them a natural history of it, offering clues into the patient’s mental state, concerns, values and priorities.

In turn, stories help doctors respond to what patients want from their medical care. In focus groups and national surveys, Charon said, patients have said their top health care priorities are the doctor-patient relationship, evidence-based medicine and care coordination among their different doctors and specialists.

In a self-portrait of Rembrandt, we see the artist’s face full of conflicting emotions, from achievement to worry and doubt. It reminds us, said Charon, that we’re seeking a certain personalized level of attention to our contradictory knowledge and emotions.

More than the sum of his or her symptoms, each patient is a complex amalgam of unique life experiences, she said.

“Most patients want us [doctors] to know not just what’s the matter with them, but also what matters to them.” **R**



At left, Dr. Miriam Posner of UCLA discusses “Lobotomy, Science and the Digital Humanities” at an NLM lecture. At right, a slide from her talk shows neuroscientist Freeman, “the world’s greatest proponent and pioneer of lobotomy,” performing the surgery.

Lobotomy

CONTINUED FROM PAGE 1

film clips—that she happened to see. The images—before-and-after close-ups of patient faces—were presented in medical journals and textbooks as proof that partial brain excision succeeded in healing mentally ill people.

“It seemed strange to me that there was a time when people’s affect and expressions could be accepted as medical evidence,” Posner recalled. “How could it be that faces made sense as proof 50 years ago?”

Take Freeman’s case number 121, a woman he photographed several times over the course of some 4 years. In the first portrait, a young woman glares into the camera, unsmiling, brows furrowed. She looks slightly combative. The caption notes, “March 23, 1942 before operation. ‘Forever fighting....the meanest woman.’”

Another image shows the same woman, the top front portion of her hair shorn to the scalp. She’s smiling. The caption reads, “April 4, 1942, eleven days after lobotomy. She giggles a lot.”

By the series’ fifth photo, the woman has donned a contemporary ladies’ hat for her portrait, which was taken 4 years post-lobotomy. Images in between captured her modest weight gain and note that she has found regular employment—both circumstances offered as further “evidence” that lobotomy has benefited her. In picture 5, again she’s smiling. Freeman’s caption: “June 15, 1946, three [sic] years after lobotomy.

‘Refused to marry a drunkard.’”

By then, 10 years after Freeman had performed the first lobotomy in 1936, the procedure “was very much on the frontlines of medical science,” said Posner. Freeman’s photos illustrated journal articles that he—and many in the medical establishment then—believed were documentation that his surgeries cured severe mental illness.

“Freeman thought psychosis was the result of excessive self-reflection, thoughts that circled back on themselves over and over again,” Posner explained. “He was

being literal when he said lobotomy was a way of cutting those endlessly circling thoughts off within the brain, [a way] of breaking that circle.”

Following Freeman’s lead, hundreds of physicians performed thousands of lobotomies in the United States during the procedure’s prime. By 1945, he had revolutionized the technique. By inserting a long, thin instrument—modeled after an icepick—to pierce the brain via the patient’s eye socket, Freeman devised what he called the “transorbital lobotomy.”

With this invention, he claimed he no longer needed a drill, sterile field nor surgical scrubs. His longtime operating room partner quit in protest. Freeman was undeterred, taking operations on the road by way of a camper van. He traveled the country, performed lobotomies and gave lectures “at an almost frenzied pace,” Posner said.

In a sort of makeshift longitudinal study, Freeman diligently kept a journal, recording his work in words and images, sometimes logging more than two dozen lobotomies in a single day. In a stretch of August 1958 entries, he journeyed from Lincoln, Nebraska, to St. Joseph, Missouri, to Cherokee, and then Independence, Iowa—50 transorbital lobotomies in just more than 4 days across 650 miles of America’s heartland. His new scaled-down method went quicker sans drill, O.R. and surgical assistants.



At left, Freeman’s case number 121, a woman he photographed several times: In the first portrait, pre-lobotomy, she looks slightly combative; in the second—after the procedure—she’s smiling. Freeman used the photos as evidence of lobotomy’s effectiveness. By the series’ fifth photo, at right, the woman has donned a contemporary ladies’ hat for her portrait, which was taken 4 years post-lobotomy.



At right, Freeman’s case number 121, a woman he photographed several times: In the first portrait, pre-lobotomy, she looks slightly combative; in the second—after the procedure—she’s smiling. Freeman used the photos as evidence of lobotomy’s effectiveness. By the series’ fifth photo, at right, the woman has donned a contemporary ladies’ hat for her portrait, which was taken 4 years post-lobotomy.



In her history of medicine talk, Posner examines evidence now viewed in the digital age.

LECTURE PHOTOS: MARLEEN VAN DEN NESTE

Only the development of Thorazine as an effective, less invasive anti-psychotic brought the widespread practice of lobotomy to an end, Posner reported. The medical community quickly moved on. Freeman, however, still held that his

camera lens for “the clinical gaze.”

By 1920, Dr. Harvey Cushing was transforming the field of neurosurgery with, among other innovations, his extensive documentation and collection of patient images and brain samples.

“So Freeman’s photographic practice was not as unhinged as it might have seemed at first,” explained Posner. “He actually inherited a long tradition of using faces to demonstrate sanity or insanity.”

Sure, Freeman’s approach to scientific corroboration seemed unorthodox and even shocking when viewed initially, Posner said, but placed in context, our perspective may have changed.

“When we talk about the history of psychiatry, we have to be careful about which mode of evidence we use to bolster our claim,” she cautioned. “The story the journals tell is different from the psychiatry physicians performed for each other on the lecture stage...The oral performance of

• • •

“When we talk about the history of psychiatry, we have to be careful about which mode of evidence we use to bolster our claim. The story the journals tell is different from the psychiatry physicians performed for each other on the lecture stage.”

-DR. MIRIAM POSNER

procedure was better.

So lobotomy fell out of fashion, but in the course of her research, Posner learned there was more to the story of portraits as proof.


“There’s actually a solid foundation for Freeman’s belief that photographs constituted acceptable medical evidence,” she recounted. “He was drawing on centuries of psychiatric and philosophic tradition that saw the face as a legitimate and reliable indicator of the contents of the soul.”

Posner traced the ideology back to 18th century theologian Johann Kasper Lavater, a physiognomy advocate who argued that the face revealed specifics about a person’s character. Some hundred years later, French neurologist Jean-Martin Charcot “used photography as a tool of scientific scrutiny.” He gained—and shared—medical insights from having his patients look directly at the

medicine could differ markedly from the way medicine is articulated and circulated in medical journals. It’s more theatrical, more improvisational and more visual.”

As 21st century medicine ventures ever farther into the era of Big Data and its widely foretold promise, a history lesson on how scientific evidence is derived, used and communicated to inform treatment strategy seems timely.

“Freeman’s photos suggest to me that for all of 20th century medicine that’s well documented,” Posner concluded, “there are apparently important features of its visual culture that are yet to be excavated.”

Her entire lecture is archived at <https://videocast.nih.gov/summary.asp?Live=29010&bhcp=1>. 

Structural Biologist Wilson To Give Kinyoun Lecture

Dr. Ian A. Wilson, Hansen professor of structural biology and chair, department



Dr. Ian A. Wilson

of integrative structural and computational biology at the Scripps Research Institute, La Jolla, Calif., will deliver the 2019 Joseph J. Kinyoun Memorial Lecture on Tuesday, Nov. 19 at 3 p.m. in Lipsett Amphitheater, Bldg. 10. His presentation is titled, “Structure-assisted Design of Universal Vaccines and Therapeutics Against Influenza Virus.”

Wilson will explain how insights gained through structural biology approaches are aiding in devising new ways to treat or prevent influenza.

The health and economic burdens of seasonal flu vary widely but are significant. According to estimates by the CDC, influenza caused between 46 million and 53 million cases of illness and up to 99,000 deaths in the United States last season.

Wilson will discuss his laboratory’s efforts to determine the structures of broadly neutralizing antibodies against two influenza proteins. The work has revealed major sites of vulnerability on the virus. He also will describe how this information could aid the quest to develop new flu vaccines and therapies that provide broad and durable protection against multiple flu strains and subtypes, unlike seasonal vaccines and current therapeutics.

Since joining Scripps in 1982, Wilson and his lab have solved more than 670 biological structures, including more than 300 antibodies. From 2000 to 2016, he directed the Joint Center for Structural Genomics, a multi-institution consortium, and oversaw the development of novel and improved high-throughput methods of protein expression, crystallization, structural determination and analysis by X-ray and nuclear magnetic resonance.

The annual Kinyoun Lecture commemorates Dr. Joseph J. Kinyoun who, in 1887, founded the Laboratory of Hygiene, the institution that later would become NIH. Since 1979, NIAID has invited distinguished guests to present their work in the fields of infectious diseases and immunology for this lectureship.



At left, Langevin chats with former Sen. Tom Harkin before the symposium. He was an early patron of what has become NCCIH. At right, NIH director Dr. Francis Collins offers remarks at the 20th anniversary event.

Anniversary

CONTINUED FROM PAGE 1

valued and important member of the NIH family,” said NIH director Dr. Francis Collins in his welcoming remarks. “The momentum is unstoppable and it’s wonderful to see as an evolutionary process.”

In 20 years, the center has grown from a handful of employees in a couple of rooms to 68 FTEs (and additional part-time and contract staff) and a budget of \$146.473 million in fiscal year 2019.

Dr. Helene Langevin, NCCIH director, recalled, “Twenty years ago, I was one of the first grantees to be funded by what was then NCCAM: to build a robotic device to measure the tissue forces that occur during acupuncture needling. It turned out that the tool was very helpful to perform experiments and gave us a lot of information about what happens biomechanically in tissues when you insert a needle. If NCCIH had not taken a chance and funded a project that may have sounded unusual to some, I would not be here today.”

The center’s journey began in 1998, when Congress elevated NIH’s Office of

Alternative Medicine to an independent NIH center called the National Center for Complementary and Alternative Medicine. Congress changed the center’s name to the National Center for Complementary and Integrative Health in 2014.

Today, NCCIH supports rigorous basic, mechanistic, clinical and translational research. Complementary and integrative approaches are practices and products that originate outside conventional medicine, such as herbal supplements, probiotics, acupuncture, spinal manipulation, yoga and meditation. Training and career development of researchers and providing science-based information also fall within the mission.

According to a federal survey, Americans spend more than \$30 billion per year on complementary/integrative approaches to improve their health, manage chronic-disease symptoms and/or counter medication side effects. However, evidence on the safety and efficacy of those practices has been limited. The symposium illustrated NCCIH’s role in expanding understanding of these interventions so that patients, health

care providers and the public can be better informed about them.

The day began with the annual Stephen E. Straus Distinguished Lecture in Complementary and Integrative Health, which honors NCCIH’s founding director. Dr. Lorimer Moseley, inaugural chair in physiotherapy and professor of clinical neurosciences at the University of South Australia, spoke on “Why We Need a Pain Revolution: From Science to Practice.”

Moseley discussed several of his studies. One area, for example, is the distortion of body image that can occur when people have pain, especially chronic pain. His team “aims to innovate, test and implement new solutions that will reduce the likelihood of getting pain, or [assist] recovery.” It is important for clinical work and research to inform each other, he noted.

Moseley also works to bring pain clinicians, researchers and patients together to address common misconceptions about pain and share the science as well as clinical recommendations. He founded and leads Pain Revolution, a grass-roots, capacity-building movement in Australia to bring access to knowledge, skills and support to all in pain.

“We aim to give people an understanding of the tip of the iceberg [and of] some core principles such as ‘It’s safe to move. Motion is lotion,’” he said. “If people learn a new way of thinking about pain, the long-term benefit appears to be substantial. Imagine if a patient with musculoskeletal pain asked a clinician, ‘Can you teach me what’s going on in my body and help me negotiate this recovery as quickly as I can?’ instead of ‘Can you give me a drug to take away this pain, or [do] surgery?’...We think consumers have to drive this change.”

Next, nearly a dozen early-stage investigators, including three from NCCIH’s intramural division, discussed their NCCIH-supported work in a lightning round.

One of NCCIH’s major interests is understanding the biological mechanisms of pain; identifying effective, nonpharmacologic approaches to reduce its duration and intensity; and improving its clinical management. A panel explored the topic within the military and veterans communities and their health care delivery systems, through the NIH-Department of Defense-Department of Veterans Affairs Pain Collaboratory, which is led by NCCIH.



At left, keynote speaker Dr. Lorimer Moseley answers questions. At right, panelists (from l) Dr. Wendy Weber, NCCIH; Dr. Donald McGeary, University of Texas Health Science Center at San Antonio; and Dr. Christine Goertz, Spine Institute for Quality, address questions from the audience.



NCCIH deputy director Dr. David Shurtleff speaks at the symposium as Langevin looks on.

PHOTOS: CHIA-CHI CHARLIE CHANG


The center also has a role in other trans-NIH efforts such as the Sound Health Initiative (studies of music's intersection with the brain in relation to health and disease); the Brain Research Through Advancing Innovative Neurotechnologies (BRAIN) Initiative; and the Helping to End Addiction Long-term (HEAL) Initiative. Of HEAL, Collins noted, "We won't end addiction long-term unless we have other alternatives for people who suffer from pain, that don't lead down this terrible path towards addiction. NCCIH is [positioned] right in the middle of that."

The second panel discussed natural products. NCCIH programs in this area include a Center of Excellence for Natural Product-Drug Interaction Research and

the Centers for Advancing Research on Botanical and Other Natural Products (CARBON) Program (the latter cosponsored with the Office of Dietary Supplements). For example, CARBON researchers recently identified two chemicals in grapes that could significantly reduce depression-like behaviors in mice, and do not target the same systems as current antidepressants. NCCIH efforts getting underway include studies of cannabinoids in relation to pain and of cytosine, a natural product used in some countries to aid smoking cessation.

In closing reflections, Langevin introduced a concept the center is developing—"Whole Person Health"—that looks at the bi-directional continuum of health as it moves from a healthy state to pre-disease to disease. Also of interest is how NCCIH might inform interventions at different stages of the continuum to restore health.

"So far, there's not a lot of work on health restoration: how does one get back to health after having been sick, or having had a relapse of a chronic condition?" she asked. Bringing this model into the discussion as NCCIH begins to develop its next strategic plan could inform a shift in the portfolio toward more research in health promotion and disease prevention.

The full symposium can be viewed at <https://videocast.nih.gov/Summary.asp?Live=33411&bhcp=1>. 

Dillard To Give NIMHD Seminar, Nov. 12

In celebration of Native American Heritage Month, Dr. Denise Dillard will be the guest speaker for the NIMHD Director's Seminar Series on Tuesday, Nov. 12 from 3 to 4:30 p.m. in Lipsett Amphitheater, Bldg. 10. The title of her talk is "Genetic Research with Alaska Native People: Lessons and Future Possibilities."



Dr. Denise Dillard

An Inupiaq Eskimo born and raised in Alaska, Dillard is director of research for Southcentral Foundation, a tribal organization that provides primary health care services for 65,000 Alaska Native and American Indian people.

Dillard has led a diverse research portfolio to address the wide-ranging health and research needs of the community she serves. Having served as principal investigator of projects focused on behavioral health, diabetes and cancer screening, she has co-led several pharmacogenetic studies as part of the Northwest Pharmacogenetic Research Network.

In 2015, Dillard was nominated by the King Island Tribal Council to serve on the NIH tribal advisory committee, first as the Alaska delegate and eventually as a member-at-large.

Sign language interpreters will be provided. Individuals who need reasonable accommodation should call Edgar Dews at (301) 402-1366 or the Federal Relay at 1-800-877-8339.

CFC Directors' Challenge: Karaoke Contest Nov. 14

Calling all singers, crooners and balladeers. This year's Combined Federal Campaign (CFC) Directors' Challenge is a karaoke contest!

Each IC can enter one act with up to five performers. Extra points go to acts that feature IC directors or deputy directors. Extra points also go to acts that feature songs with vision-related lyrics (eye, see, vision, etc.) or that harmonize with the CFC theme: Show Some Love.

Be part of the show or come cheer on your colleagues, Thursday, Nov. 14, 10:30 a.m. to noon, in Lipsett Amphitheater, Bldg. 10.

Didn't submit your song by the deadline? Make your case to Amishi Shah at Amishi.shah@nih.gov or (301) 496-5248.

Support a cause that you find meaningful by searching for CFC-participating charities at <https://cfc.nih.gov/>.

NIH Rural Health Seminar, Nov. 18

The Inaugural NIH Rural Health Seminar will be held Monday, Nov. 18 from 9:30 a.m. to noon at Natcher Conference Center, Rms. A/B.

It will bring together researchers, medical practitioners and others to explore topics in rural health and to share research ideas for how innovations in clinical and translational science could improve rural health outcomes. The seminar is co-sponsored by NCATS, NIMH and NIMHD with contributions from NCI, NHLBI, NIA, NICHD, NIDA, NIDCR, NIDDK, NIGMS and NINR.

Today, approximately 20 percent of the U.S. population—nearly 60 million people—live in rural areas, which make up 97 percent of the land area of the United States. Residents of rural America have less access to health care and are more likely to die from heart disease, cancer, stroke and chronic lower respiratory disease than residents of urban areas.

The disparities and health care challenges facing rural America call for additional rigorous scientific research, successful implementation of evidence-based practice in rural settings and use of innovative technology to improve rural health outcomes.

For details on how to register, visit <https://ncats.nih.gov/events>. The seminar will be videocast and archived for those unable to attend in person.

Those who need sign language interpreters and/or reasonable accommodation to participate should contact Brandin DeChabert (brandin.dechabert@nih.gov, 301-451-3705) and/or the Federal Relay (1-800-877-8339). Requests should be made at least 3 days before the event.

Artificial Pancreas System Better Controls Blood Glucose Levels Than Current Technology

A multicenter randomized clinical trial evaluating a new artificial pancreas system—which automatically monitors and regulates blood glucose levels—has found that the new system was more effective than existing treatments at controlling blood glucose levels in people with type 1 diabetes. The trial was primarily funded by NIDDK.

The study showed that the system improved participants' blood glucose control throughout the day and overnight. The latter is a common but serious challenge for children and adults with type 1 diabetes, since blood glucose can drop to dangerously low levels when a person is asleep. The research is published in the *New England Journal of Medicine*.

The artificial pancreas, also known as closed-loop control, is an “all-in-one” diabetes management system that tracks blood glucose levels using a continuous glucose monitor (CGM) and automatically delivers the hormone insulin when needed using an insulin pump. The system replaces reliance on testing by fingerstick or CGM with separate delivery of insulin by multiple daily injections or a pump.

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Nicotine Addiction Linked to Diabetes in Animal Models

Researchers have discovered a mechanism in rats that links cigarette smoking and the risk of developing type 2 diabetes. Scientists found a crucial role for a diabetes-associated gene, called transcription factor 7-like 2 (Tcf7l2), in regulating the response to nicotine in the brain.

Tcf7l2, which regulates the expression of genes in the pancreas and liver that determine blood glucose levels, also regulates the response of cells in the habenula, an area of the brain that controls reward and aversion behaviors, to nicotine. Variation in Tcf7l2 increases the risk of developing type 2 diabetes, but little has been known about its function in the brain. The study discovered that Tcf7l2 controls a pathway linking the habenula, which controls nicotine intake, to the pancreas, with this circuit responsible for nicotine-induced increases in blood glucose.

To investigate the association between Tcf7l2, nicotine addiction and blood glucose regulation, researchers genetically deleted Tcf7l2 in rats. The mutant rats consumed much greater quantities of nicotine at each dose. Unexpectedly, while the loss of Tcf7l2 function in the habenula increased nicotine consumption in rats, this change also reduced nicotine-driven blood glucose increases and protected against the emergence of diabetes-associated abnormalities in blood glucose levels.



The Control-IQ artificial pancreas system was derived from research done at the Center for Diabetes Technology at the University of Virginia.

IMAGE: TANDEM DIABETES CARE

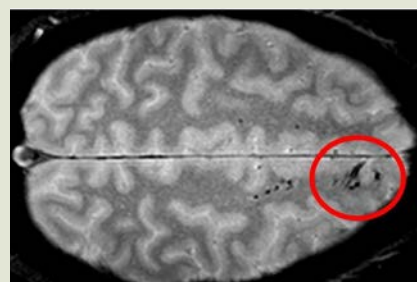
“This unanticipated finding suggests a link between nicotine use and the onset of type 2 diabetes, with implications for future prevention and treatment strategies for both diseases,” said NIDA director Dr. Nora Volkow. “Although addiction is a brain disease, this discovery underscores how the body’s complex functions are exquisitely interconnected, revealing the need for integrated and innovative research.”

Microbleeds May Worsen Outcome After Head Injury

Using advanced imaging, researchers have uncovered new information regarding traumatic microbleeds, which appear as small, dark lesions on MRI scans after head injury but are typically too small to be detected on CT scans. The findings, published in *Brain*, suggest that traumatic microbleeds are a form of injury to brain blood vessels and may predict worse outcomes. The study was conducted in part by scientists at NINDS.

“Traumatic microbleeds may represent injury to blood vessels that occur following even minor head injury,” said Dr. Lawrence Latour, NINDS researcher and senior author of the study. “While we know that damage to brain cells can be devastating, the exact impact of this vascular injury following head trauma is uncertain and requires further study.”

This study, which involved researchers from Cold Spring Harbor Laboratory in New York and the Uniformed Services University of the Health Sciences in Bethesda, included 439 adults who experienced head injury and were treated in the emergency department. The subjects underwent MRI scans within 48 hours of injury, and again during four subsequent visits. Participants also completed behavioral and outcome questionnaires.



Traumatic microbleeds appear as dark lesions on MRI scans and suggest damage to brain blood vessels after head injury.

IMAGE: LATOUR LAB/NINDS

Scientists Work Toward Rapid Point-of-Care Diagnostic Test for Lyme Disease

A study published in the *Journal of Clinical Microbiology* describes a new rapid assay for Lyme disease that could lead to a practical test for use by health care providers. The researchers found that the assay, which uses several biomarkers to detect Lyme disease infection, was more sensitive than current laboratory-based tests when diagnosing Lyme disease early after suspected infection. The research was supported by NIAID.

Lyme disease is caused by *Borrelia burgdorferi*, a spiral-shaped bacterium transmitted by deer ticks. Most cases of Lyme disease can be treated effectively with a short course of antibiotics. However, Lyme disease can be difficult to diagnose because it causes a wide range of symptoms, from fever and rash to neurologic and cardiac symptoms and joint pain.

Current Lyme disease tests also can miss an infection if performed too early. The Centers for Disease Control and Prevention recommends a two-step blood test for diagnosing Lyme disease that looks for antibodies against Lyme disease. These tests require specialized laboratory equipment and can require days or weeks to return results.

The authors of the paper plan to develop a simpler, faster, more sensitive test that could be used at the point of care during a single visit to a health care provider.



Scientists have discovered a mechanism in rats that links cigarette smoking and the risk of developing type 2 diabetes.

IMAGE: NIKKYTOK/ISTOCK

Schairer Retires from NCI

Dr. Catherine Schairer, senior staff scientist in NCI's Metabolic Epidemiology Branch (MEB), retired from the Division of Cancer Epidemiology and Genetics in September after 37 years of service. She is best known for her work on female breast cancer.

Schairer earned her master of science in biostatistics from the University of California, Los Angeles, before joining DCEG as a health statistician in 1982. She earned her doctorate in epidemiology from Johns Hopkins University after receiving a long-term training fellowship from NCI. She worked as an epidemiologist in the division since 1993, primarily in the Biostatistics Branch, and more recently in MEB.

Schairer made integral contributions to the division's study of breast cancer in two major areas: risk associated with exogenous menopausal hormone use and the etiology of inflammatory breast cancer.

She led studies of inflammatory breast cancer in North Africa through political revolutions in both



Dr. Catherine Schairer

Egypt and Tunisia and in the Cancer Research Network in the United States. DNA retrieved from the North Africa study will contribute to the study of breast cancer genetics through genome-wide association studies by creating a large and diverse resource of breast cancer cases and controls in the Confluence Project.

Schairer received the Division of Cancer Epidemiology and Genetics Mentoring Award in 1998. She also served on several committees, and since 2011 had been chair of the NCI special studies institutional review board, for which she received the DCEG Special Recognition Award in 2019.

"Cathy's leadership of the special studies IRB was exemplary and was critical in allowing DCEG to maintain and grow its crucial portfolio of national and international studies that presented human subjects protection challenges distinct from those faced by clinical researchers," said Dr. Christian Abnet, chief and senior investigator in MEB. "Her work ensured that all DCEG activities met the highest ethical standards and will serve as a guidepost for our work in the future."

NCI's Vydelingum Mourned

Dr. Nadarajen Vydelingum, fondly known as Nada, passed away on Aug. 28. He was a cell biologist, educator, researcher and health administrator. He had retired from the National Cancer Institute 3 years ago.

He received his bachelor of science in cell biology with honors at Birkbeck London University,



Dr. Nadarajen Vydelingum

England, in 1972; his master of science in biochemistry from Birkbeck in 1974; and received a doctor of philosophy degree in clinical biochemistry from St. Mary's Medical School, London, in 1979. He had later academic appointments

at the University of Wisconsin, Milwaukee, the Medical College of Wisconsin and at Memorial Sloan Kettering Cancer Center.

Vydelingum enjoyed his work in the science industry. He was a health science administrator for bioengineering and physiology at NIH from 1991 to 2016. Prior to coming to the Division of Cancer Prevention, NCI, he served as a deputy director (2001-2008) of NCI's Center to Reduce Cancer Health Disparities. He served in the Division of Cancer Prevention for more than 5 years and was in the cancer biomarkers research group from 2012 until his retirement in 2016.

He is survived by his wife Nancy Yurman, a daughter, a son, two granddaughters, a brother, two sisters and his first wife, Rose Vydelingum. **R**



NIH Relocates Fleet Gas Station

Due to a need for improved security and to remedy environmental concerns, NIH is relocating the fleet gas station, which has been behind Bldg. 12 for decades, to an area on the east side of parking lot 41.

The new facility will include above-ground tanks containing unleaded gas, ethanol 85 percent (E-85) and bio-diesel. Construction began in September and is expected to take about 4 months. The station is for NIH government fleet vehicles only.

During construction, some 50 parking spaces will be unavailable. Once complete, there will be a net loss of 25 parking spaces in lot 41. Detour signs have been posted to guide pedestrians around the work zone.

For questions about the project, contact Chan-Nhu Nguyen at chan-nhu.nguyen@nih.gov or (301) 496-4983.



Clockwise (from I): Rendering of the new gas station located in lot 41 south of Bldg. 41

New gas station looking west from east edge of lot 41

New gas station looking northeast at the southwest façade



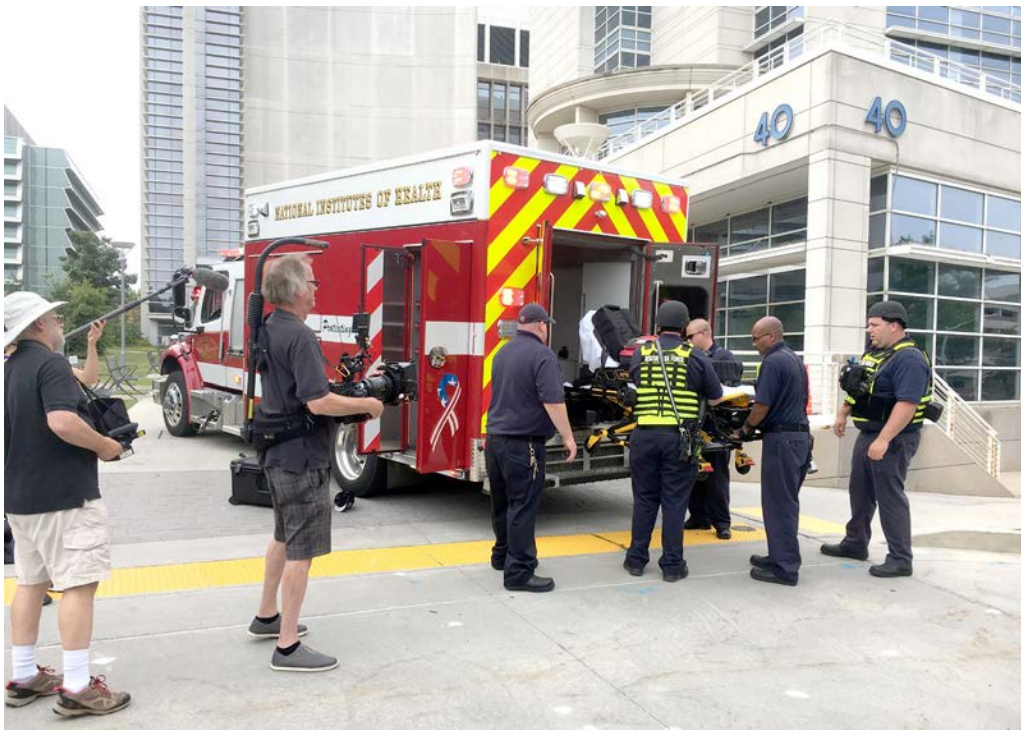
VOLUNTEERS

Vaccine Study Needs Normal Volunteers

NIAID researchers seek healthy volunteers, 18 to 70 years old, to participate in an influenza (flu) vaccine study. Scientists are testing an investigational vaccine to determine if it is safe and if there are any side effects. There is no risk of infection since the investigational vaccine product does not contain any virus. Compensation is provided. For more information, call 1-866-833-5433 or email vaccines@nih.gov.

Patients with Myeloma Needed

Do you or someone you know have hard to treat multiple myeloma that has spread to your soft tissue and/or bones and are thinking about options? NCI researchers are conducting a clinical trial for relapsed refractory multiple myeloma using the immunotherapy drug avelumab with radiation therapy with hopes that they may help your body's immune system destroy the myeloma cells. Call the NIH Office of Patient Recruitment at 1-866-444-2214. Refer to study 19-C-0078. Read more at <https://go.usa.gov/xymTF>.



NIH Fire and Rescue respond to a mock active shooter event in Bldg. 35. Shown are (from l) Tom Feliu of Rocket Media, cameraman Mike Peters, Fire Technician Josh Morris, Fire Technician Ryan Pidgeon, Fire Technician Michael Keys, Master Firefighter Delonte Stephens and Fire Technician Kory Alspaugh.



During an active shooter event, the first safety step is to run, as shown by Stephanie Vann (running through door) as Feliu of Rocket Media films the action.

Training Video on Active Shooter Filmed

PHOTOS: JOY FARRAR, ALICE HARDY

On Sept. 5-8, the NIH Police filmed an active shooter training video on campus near Bldg. 35 and along Convent Drive. The subject involved civilian response to an active shooter situation.

Portions of the film were intended to simulate an actual emergency situation. NIH officers displayed weapons, but no shots, real or simulated, were fired.

The NIH Fire Department responded to simulated victims.

To a bystander, these staged victims could look real but they were only present in the area of Bldg. 35. Actors played various roles in the film.

The training video will help NIH Police better educate and prepare employees for the proper response in the unlikely event of a true active shooter situation.

A wide distribution is anticipated once the video is finished late this year, including as part of employee training and orientation.



During an active shooter event, if you cannot run or hide, then fight with whatever you can find. Shown at left are actors (from l) Ray Ficca (shooter), Antonio Garcia (holding gray canister), Vincent Stovall (holding acid jar) and Fariba Armani (holding fire extinguisher). At right, actors receive direction on the fight scene. Crew member Brian Dinkel is in foreground.