

nih record



ABOVE • No buckets came easy in the recent Spring into Health 3-on-3 hoops tournament. See story on p. 12.

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New Flu Strategy

Palese Points Way to Universal Influenza Virus Vaccine

By Belle Waring

Flu viruses morph like shapeshifters from the old myths, returning yearly to sicken and kill. Because they are constantly changing, it's hard to develop a universal vaccine against them.

Now Dr. Peter Palese has a new strategy.

"We want to make a vaccine that can last 20 years or even a lifetime," said Palese during his recent Wednesday Afternoon Lecture titled "Towards a Universal Influenza Virus Vaccine."

Professor and chairman of the department of microbiology at Mt. Sinai School of Medicine, Palese has been internationally honored for his fundamental work on the genetics of influenza viruses. He spoke to a large crowd in Masur Auditorium.

"The present vaccines against influenza are pretty good. The big problem with



Dr. Peter Palese has a strategy for a universal flu vaccine, which he shared with a Masur audience.

SEE **FLU VACCINE**, PAGE 8

The Power of Affinity

Author's Autistic Son Finds His Voice Through Film

By Dana Steinberg

Sometimes we're caught completely unprepared for what life throws at us. We're busy, hard at work and play, then comes a curveball. Somehow, we have to adapt and find a way forward.

About 20 years ago, journalist Ron Suskind and his family moved to Washington. He'd accepted a new job with the *Wall Street Journal*, where his reporting would soon earn him a Pulitzer Prize



Author Ron Suskind

for stories about an aspiring inner city youth who'd been left behind but managed to climb out of his predicament. Meanwhile, at home,

SEE **SUSKIND**, PAGE 4



NIBIB director Dr. Roderic Pettigrew (c) stands with Maysam Ghovanloo (r) of Georgia Institute of Technology and his graduate student as they present the Tongue Drive System, which enables individuals with severe paralysis to navigate their environment using only tongue movements.

NIBIB Acquaints Congressional Staff with High Technology

While holding up a picture of an ultrasound device the size of a smartphone, NIBIB director Dr. Roderic Pettigrew explained to a group of 45 congressional aides that NIBIB is leading the development of next-generation biomedical technologies that are smaller, faster, cheaper and more effective. "These technologies will

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NIH...Turning Discovery Into Health



Author Nast Gives DDM Seminar, June 26

The Deputy Director for Management (DDM) announces the fourth DDM seminar of the 2013-2014 series "Management and Science: Partnering for Excellence." The event on Thursday, June 26 from 11 a.m. to 12:30 p.m. in Masur Auditorium, Bldg. 10 will feature author Jamie Nast, who will discuss "Idea Mapping." Nast will focus on how to access your hidden brain power, learn faster, remember more and achieve success. This interactive session will stimulate whole-brain visual thinking to enhance memory, planning, creativity and communication.

Videocasting and sign language interpretation will be provided. Individuals who need reasonable accommodation to attend should call (301) 496-6211 or the Federal Relay Service at 1-800-877-8339.

For more information about the series, visit www.ddmseries.od.nih.gov or call (301) 496-3271.

New 'RLA' Badge To Replace Legacy Badge for Some NIH'ers

Starting July 1, NIH will begin issuing a new type of identification credential, the restricted local access (RLA) badge, to NIH staff who won't require a PIV card (HHS ID badge) but will still need physical and logical (NIH computer or network system) access. Candidates for the new badge include people in three categories:

Short-term staff who will be at NIH less than 6 months (including summer students beginning in 2015); intermittent staff; and foreign nationals. Summer students entered into NED July 1 or later will also be issued an RLA badge.

Individuals in these three categories whose badge request is entered into NED before July 1 will not receive an RLA badge. Only badge requests entered in NED on or after July 1 will receive the RLA badge. Any individuals in the above categories who currently possess an HHS ID badge or NIH legacy badge will receive an RLA badge when their current badge is renewed.

Issuance of the RLA will require both an enrollment and issuance appointment.

The RLA badge is valid for 3 years when issued to foreign nationals and intermittent staff. RLA badges issued to short-term staff are valid for a maximum of



6 months. When RLA badges are issued to summer students, they will be valid through Sept. 30 of the year issued.

Cedar Lane Construction To Mar Summer Commute

Commuters who use Cedar Ln. east of Rockville Pike to drive to and from NIH are in for difficulties this summer as the intersection of east Cedar and the Pike is closed for repairs until Aug. 22. Walkers and bikers, however, will find the way clear.

The construction is part of a project to improve the intersection of Rockville Pike at Cedar Ln. in the wake of the National Naval Medical Center's absorption of Walter Reed Army Medical Center. Once this portion of the work is complete, the intersection will include a new, dedicated right-turn lane for northbound Rockville Pike traffic, a relocated entrance to Stone Ridge school and replacement of underground utilities.

The project's impact is nearly identical to the disruption NIH'ers faced in the summer of 2011, when the bridge over Rock Creek near the corner of Cedar and Beach Dr. was rebuilt. Like that project, the current work is timed to coincide with summer break for county public school students.

As was the case 3 years ago, a detour route will carry commuters around the project, using Strathmore Ln. and Rockville Pike as alternatives.

For more information about detour routes, visit www.montgomerycountymd.gov/brac/Resources/Files/CedarLaneClosureSHA-DetourMap052014.pdf or <http://traffic.nih.gov>.



Tree of Hippocrates, Part II

There is actually a second Tree of Hippocrates at NIH, in addition to the one dedicated on Apr. 25 in front of the National Library of Medicine. The second clone (above, shrouded in a 20-gallon bag of water, which slowly nourishes the roots) is planted in front of the Clinical Research Center. Like its sibling, it has a dedicatory plaque and the same mission to remind caregivers: "First, do no harm." Savvy NIH'ers will recognize that the volcanic stone on which the plaque is embedded is the same one that sat for years on Center Dr., marking the original campus Tree of Hippocrates, which stood from 1961 to 2013.



The garden features a center granite medallion inlaid with the logo of a journal founded by Jeang.

NIAID's Jeang Honored with Memorial Garden, Lecture

On May 15, in memory of Dr. Kuan-Teh Jeang, the first Jeang Memorial Lecture took place in Lipsett Amphitheater and the Society of Chinese Bioscientists in America (SCBA) Washington, D.C., chapter dedicated the Jeang Memorial Garden to NIH.

Teh, as Jeang was known to friends and colleagues, was a world-class retrovirologist, a dedicated mentor and a renowned advocate for increased representation of Asian and other minority scientists in leadership positions in America. He served as president of SCBA from 2010-2012. Under his leadership, the society has united Chinese bioscientists from Taiwan, Hong Kong and mainland China into one society with one goal.

NIH has established an annual Jeang Memorial Lecture series to honor his legacy. Dr. Yuan Chang of the University of Pittsburgh Cancer Institute gave the first Jeang lecture. She spoke of her friendship with Jeang and her discovery of Kaposi sarcoma-associated herpes virus and Merkel cell polyomavirus, two of only seven viruses known to cause human cancers.

The Jeang Memorial Garden, located between Bldgs. 31 and 6, became a reality due to a large number of donations collected by SCBA, deep involvement of Jeang's family and strong support from NIH. The garden features a center granite medallion that is inlaid with the logo of *Retrovirology*, an open-access journal founded by Jeang, and a boulder with a plaque recounting his accomplishments.

The garden dedication ceremony was hosted by Dr. Paul Liu of NHGRI. Jeang's widow, Diane Jeang, gave heartfelt comments about Jeang and what this garden meant to her and her family. As the medallion and the plaque were unveiled by representatives of the Jeang family and SCBA, sun penetrated the clouds.



On hand for dedication of the Jeang Memorial Garden are (from l) Diana Jeang (Jeang's daughter), Yunbo Shi, Lan Lin (daughter of Jeang's cousin), Dr. Karen Kibler, Krishna Banaudha, Chen Jeang (Jeang's brother), Diane Jeang (Jeang's widow), Dr. Michael Gottesman, Dr. Richard Nakamura, Dr. Malcolm Martin, Wei Yang, Zhi-ming Zheng, Barbara Thomas (Jeang's mother-in-law), Jessica Jeang (Jeang's niece) and Dr. Paul Liu. Below is the dedicatory plaque mounted on a display rock.



Kuan-Teh Jeang (1958-2013)

Dr. Jeang was internationally recognized for his research on HIV and HTLV-1. A trailblazer, he pioneered open-access research journals and advocated for diversity and equal opportunity in science.

"We believe that diversity is important because we hold firm the idea that intelligence and ambition are distributed equally around the globe... Diversity in science and scientific publishing matters."

Kuan-Teh Jeang, MD PhD

Dr. Anthony Fauci, NIAID director, humorously reminisced about lab meetings he shared with Jeang. Dr. Malcolm Martin, a long-time colleague and Jeang's lab chief at NIAID, paid tribute to Jeang's remarkable mentorship of nearly 40 students and postdoctoral trainees during his tenure at NIH.

Dr. Karen Kibler, a former postdoctoral fellow in Jeang's lab, recounted his intense curiosity, vigorous passion and his honest and straightforward style, ending with a comment from one of Jeang's trainees: "Forever, thank you, Teh."

Dr. Michael Gottesman, NIH deputy director for intramural research, closed the ceremony, pledging that the NIH would continue its efforts to provide equal opportunity for Chinese, Asian and minority scientists. 1

SUSKIND

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Suskind advises parents of autistic children to look for opportunities to make some sort of connection. “Respect the affinity,” he said. “Find out what it is and simply share that joy instead of trying to fix them every day...I feel deeply how important it is to see things as they really are, not as we are.”

PHOTOS: ERNIE BRANSON

Suskind’s 3-year-old son Owen was diagnosed with regressive autism. The once-bubbly toddler suddenly became inconsolable and had fallen silent. So began the Suskind family’s journey to connect with Owen so he too would not be left behind.

“What begins at this point is a 20-year battle—embrace, struggle, dodge-and-fake—with affinity,” said Suskind at a recent NIMH lecture, “Autism’s Powerful Affinities: Prison or Pathway?” The talk was in observance of National Autism Awareness Month. It’s a personal narrative he tells in his new book, *Life, Animated: A Story of Sidekicks, Heroes and Autism*, and it’s a story that has recently piqued the interest of some scientists.

A year into Owen’s silence, his one passion was watching Disney animated movies, an activity he loved before the disease’s onset. “He’s up all night, he’s irrational, he’s miserable, he’s silent,” recounted Suskind. “But somehow, sitting watching these movies—*The Little Mermaid*, his chosen movie that year—he just seemed to be settled, comfortable.”

Some doctors warned Suskind against encouraging a single affinity—in this case, Disney movies—to the exclusion of all else. But for the Suskind family, it was their one way forward and, for years, their only way to communicate with Owen. Suskind said he once tried to limit Owen’s dose of Disney; he even locked up the TV. “But it’s like we cut off his supply line,” Suskind said. “He was divorced from his nourishment.”

When Owen was 6, he repeatedly uttered a phrase from *The Little Mermaid*. But the family’s hopes were dashed when doctors described it as echolalia, an imitation. Owen didn’t comprehend what he was saying. Then one day, Ron Suskind picked up a puppet of Iago, the evil sidekick from *Aladdin*, and imitated Iago’s voice. Owen answered as the villain Jafar. This was their first conversation. Suskind said Owen didn’t understand the dialogue at that time, but he related to the exaggerated expressions and inflections.

As Owen memorized lines from more than 20 Disney movies based on sound alone, his parents and older brother tried to help him contextualize the dialogue with acting, jumping, twirling and dancing. Ultimately, Owen learned language and social interaction skills through repeatedly watching Disney films and role-playing the characters with his family.

Disney characters became a channel through which Owen began to express his own emotions. “They’ll speak through their affinity if you can hear the language,” said Suskind. Owen most identified with sidekicks, saying they helped the hero fulfill his destiny. In Owen’s sketchpad, he drew his brother Walt as the hero and wrote, “I’m the protector of sidekicks” and “No sidekick gets left behind.”

Suskind spoke of Owen’s laser-like focus on his affinity and how that affinity unlocked what was deep within, helping his brain to navigate when traditional pathways got blocked. “Affinity leads to recognition and measurement of underlying capability that may be otherwise invisible,” Suskind said. “The brain is more nimble than we ever imagined.”

Some scientists agree. Today, neuroscientists at three universities—Yale, MIT and Cambridge (U.K.)—are collaborating on a study of affinity therapy in young autistic children. They’ll observe which parts of the brain are firing when kids are engaged with their favorite interests and what role this may play in the intellectual and social development of autistic children.

Suskind advises parents of autistic children to look for opportunities to make some sort of connection. “Respect the affinity,” he said. “Find out what it is and simply share that joy instead of trying to fix them every day...Once we respected his affinity and dove in and said, ‘Let’s make this joyous,’ even if we feel bizarre dancing in front of the screen, things occurred that surprised us...I feel deeply how important it is to see things as they really are, not as we are.”

Today, Owen is attending school in Cape Cod. When he first arrived, he started a Disney Club. For the first time, Owen has friends and they’re using their shared affinity for Disney to find comfort and build social engagement. “They’re context-blind in the world in which we walk; here they’re context-deep,” Suskind said.

A member of Disney Club, Owen’s girlfriend Emily told Owen’s dad she most identifies with Dumbo, whose ears made him different. “That’s why I’m a Dumbo person,” she said. “Over time, he learned what I have learned. The thing that made him different was his greatest strength.”



Ugandan visitors (from l) Damasco Okeny, Balbina Lamon and Doreen Lalam visit Lincoln Memorial in May.

Ugandan Family Appreciates Visit to NIH, Washington, D.C.

A family from Uganda with three teenage members affected by a seizure disorder called Nodding syndrome visited the Children's Inn at NIH in May. The disorder strikes at about age 5 and seizures and their aftereffects impair intellectual and physical development for these children. Although the disorder has been recognized for more than 50 years, the cause has remained unknown. Nodding syndrome currently affects about 3,000 children in northern Uganda and surrounding nations.

The Centers for Disease Control and Prevention has been studying the possible connection between Nodding syndrome and river blindness (onchocerciasis), transmitted by blackflies. It has been working with the Ugandan Ministry of Health in this effort. Through a collaboration between CDC, the Department of State and NIH, the family of 10 and two Ugandan health workers came to the Clinical Center to participate in an evaluation at the NIH Undiagnosed Diseases Program.

The affected children stayed at the Clinical Center; other family members stayed at the Children's Inn and visited the hospital daily. The simple rural way of life for the family members is in great contrast to the sights and sounds of the world's largest hospital dedicated to clinical research. Speaking a native dialect called Acholi,

family members relied on translators to understand their English-speaking clinicians. The meeting of the two world cultures provided an opportunity of discovery for both parties—one that may offer clues for the children who suffer from the debilitating effects of Nodding syndrome.

At the inn, the Ugandan family discovered the delights of bagels with cream cheese for breakfast and enjoyed relaxing on the second-floor deck in the afternoons after their days at the CC. Inn staff also took the mother, father and an older sister (along with a translator) to see the monuments in downtown Washington, D.C. To a family that has experienced intense civil war and been left with scarce resources, they were not only fascinated by the monuments they visited

(Washington Monument, Lincoln Memorial, MLK and FDR) but also captivated by the number of green trees they passed on the highway and by taking "selfies" on their guide's phone.

Other highlights for the family included: seeing a police officer on a horse, watching the paddle boats in the Tidal Basin across from the Jefferson Memorial and eating a dinner that felt "exactly like home." When the family returned to the CC, the nurse and doctor traveling with them said they had never seen the dad smile as much as when the mom described the "unimaginable" things she had seen in Washington, D.C.—providing a much-needed boost in spirits after all they had gone through to get from Uganda to NIH. 📷

Grand Rounds Focuses on Chimps in Research

Dr. Jeffrey Kahn (l) of Johns Hopkins University's Berman Institute of Bioethics and NIH director Dr. Francis Collins recently participated in Clinical Center Ethics Grand Rounds on the topic of chimpanzees in research. Kahn chaired an Institute of Medicine (IOM) panel—convened at NIH's request—that concluded most current uses of chimps for biomedical research are unnecessary because alternatives exist. Last year, Collins accepted most of the IOM's recommendations and NIH is now taking steps to retire the vast majority of its research chimps.

PHOTO: ERNIE BRANSON



At the foot of the Lincoln Memorial are (from l) Josephine Aryek-Kwe (nurse/translator), Lalam, Lamon and Okeny.



Right:
NIBIB intramural scientist Dr. Hari Shroff (r) plays a time-lapse video that shows the development of the nervous system in a worm embryo. The video was created using pioneering microscopes and techniques developed in his lab.



HIGH TECH

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Below, from l:
Congressional staff listen as Mehmet Toner (l) of Massachusetts General Hospital explains a technology that can isolate rare circulating tumor cells—cells that have broken off of a tumor—from the billions of other cells present in a small sample of blood. Measuring CTC levels over time could help determine whether a treatment is working.

David Erickson (l) of Cornell University shows off a point-of-care device that can diagnose a type of cancer called Kaposi's sarcoma. The device uses solar energy to heat a reaction that amplifies small samples of DNA taken from a tumor and a smartphone application to analyze and display the results.

vastly improve health care for all," he said.

The aides were invited to spend the morning on the NIH campus recently on behalf of the American Institute for Medical and Biological Engineering and the Academy of Radiology Research. The goal of the event was to give congressional aides a firsthand opportunity to learn about cutting-edge technologies being developed by NIBIB grantees and intramural scientists. Eight bioengineering graduate students from the University of California, San Diego, also attended the event.

"We wanted the congressional staff to have the opportunity to see, feel and experience the technological advances being made with NIBIB support," said Pettigrew.

The crux of the event involved hands-on demonstrations given by NIBIB-funded researchers, most of whom flew in from around the country to showcase their novel technologies.

During one demonstration, students and staff-

ers learned about the Tongue Drive System, which allows individuals with severe paralysis to operate a motorized wheelchair or computer mouse via movements of the tongue. The system consists of a headset, a smartphone and a tiny magnetic tongue stud that, when moved around the mouth, sends commands to a target device in the user environment. As part of the exhibit, an individual who uses the device was available to answer questions via Skype.

At another station, participants were encouraged to try their hand at a system that assists with minimally invasive procedures such as needle biopsies. The system attaches to an ultrasound probe and allows the operator to see the path of a needle inside the body prior to skin puncture, supporting more accurate needle placement and enhancing patient safety.

Staffers and students were particularly impressed to learn about a point-of-care device that can be used in low-resource settings to diagnose Kaposi's sarcoma—a type of cancer that affects people



with impaired immune systems, such as those living with AIDS. The device uses a lens and sunlight to generate the heat needed to amplify small samples of DNA taken from a tumor. The technician can then use a smartphone to take a picture of the sample after it has been treated with a special UV-sensitive dye and a phone application analyzes and displays the results.

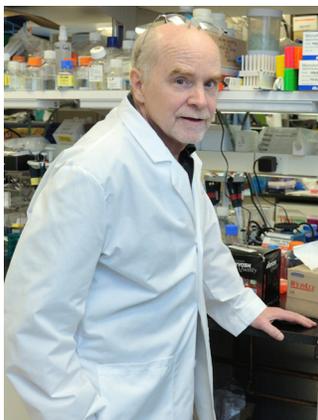
Two additional technologies featured at the event included a networked neuroprosthesis system that mirrors the peripheral nervous system and directly stimulates muscles to help patients perform tasks such as holding a cup or turning a key and a microfluidic chip that can isolate extremely rare circulating tumor cells (CTCs) from a small sample of blood. CTCs are cells that have broken off of a tumor; their detection can play an important role in early diagnosis, characterization of cancer subtypes and treatment monitoring.

In addition to the medical technology demonstrations, NIBIB intramural researcher Dr. Hari Shroff welcomed visitors into his lab for a tour of his state-of-the-art microscopes, which permit biological processes to be studied at unprecedented speed and resolution. Shroff played a time-lapse video that was created using one of his microscopes. The video tracks neuronal development in the worm embryo. Shroff says the ability to image brain cells in simple organisms during development could provide insights into how the human brain wires itself.

At the end of the morning, Pettigrew declared the event a success: "The goal was for our guests to leave excited by the tremendous potential these technologies have to help people and with an appreciation for the scientists and engineers who are committed to making these technologies a reality. I believe we achieved that." 🎯

Graduate School Fair Set, July 16

The NIH Graduate and Professional School Fair will held on Wednesday, July 16 from 9 a.m. to 3:30 p.m. at Natcher Conference Center. The fair provides an opportunity for NIH summer interns and postdocs to prepare for the next step in their careers by exploring educational programs leading to the Ph.D., M.D., D.D.S., M.D./Ph.D. and other graduate and professional degrees. More than 150 colleges and universities will send representatives. The day will also include workshops on getting to graduate and professional school, interviewing and careers in public health, psychology and dentistry. New this year will be a diversity discussion series. Exhibits will be open 10 a.m. - 2:15 p.m. Find a list of institutions planning to attend and registration details at https://www.training.nih.gov/gp_fair.



O'Shea Receives Ross Prize

NIAMS scientific director Dr. John O'Shea has been named the 2014 recipient of the Ross Prize in Molecular Medicine, given by the Feinstein Institute's peer-reviewed, open-access journal *Molecular Medicine*. The award was given on June 9 at the New York Academy of Sciences in Manhattan, followed by scientific presentations by O'Shea and other prominent researchers including Louis Staudt, director of NCI's Center for Cancer Genomics.

The award, which includes a \$50,000 prize from Feinstein Institute board members Robin and Jack Ross, is bestowed upon an active investigator who has produced innovative, paradigm-shifting research that is worthy of significant and broad attention in the field of molecular medicine.

"John's scientific achievements in molecular immunology have been transformative," said NIAMS director Dr. Stephen Katz. "His work exemplifies the bridge between basic research and clinical practice. We are very proud of John and congratulate him on this honor."

O'Shea has been a physician and immunologist at NIH for 33 years. He has made fundamental discoveries related to the signaling of cytokines, molecules that are critical for the development and functioning of the immune system. His research also has focused on the molecular cause of primary immunodeficiencies, inherited conditions in which immune function is impaired, and the genetic basis of autoinflammatory disorders, conditions in which the body attacks its own tissues. He was awarded a U.S. patent for his work on Janus family kinase inhibitors as a new class of immunosuppressive drugs. O'Shea developed a cooperative research and development agreement with the pharmaceutical company Pfizer, which generated one such compound that is approved for the treatment of rheumatoid arthritis.

O'Shea graduated Phi Beta Kappa from St. Lawrence University, Canton, N.Y. He received an M.D. from the University of Cincinnati. After completing his residency in internal medicine at the State University of New York Upstate Medical University, Syracuse, he received subspecialty training in allergy and immunology at NIH. He was appointed chief of the NIAMS Molecular Immunology and Inflammation Branch in 2002, and became scientific director of the NIAMS Intramural Research Program in 2005. O'Shea has been the recipient of numerous awards and is a fellow of the American Association for the Advancement of Science.



Moore Named NIGMS Budget Officer

Tony Moore was recently named NIGMS budget officer. In this position, he serves as principal advisor to the institute's director and senior-level officials on all fiscal matters, including budget formulation, presentation and execution. Moore began working at NIH in 1993 as a human resources assistant in the Clinical Center. After participating in the NIH Management Intern Program, he joined the NIGMS Financial Management Branch as a budget analyst, then rose through the ranks to the level of deputy budget officer. Moore earned a B.A. in political science from Frostburg State University.



FLU VACCINE

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Above:

Palese (l) speaks with attendees at a reception in the NIH Library after his talk.

PHOTOS: BILL BRANSON

influenza viruses,” said Palese, “is a lot of variability...

“If we talk about a measles virus vaccine, a mumps virus vaccine, we are using the same vaccine which was developed in the 1950s, because the virus has not changed; otherwise, the vaccine wouldn’t work today. With influenza, we have a continuing change from year to year.”

The change happens on the surface of the flu virus, which is studded with proteins resembling mushrooms. The body’s immune system targets the mushroom head, which changes every year.

“The head is 10 times more variable,” Palese explained, “so we want to make a vaccine where the immune system is directed against the stalk.” Such a vaccine would protect more broadly against different flu strains, making multi-season protection possible.

Know Your Enemy

Flu-related illnesses kill up to 49,000 Americans annually, according to the Centers for Disease Control and Prevention, and cost the U.S. economy about \$87 billion. The World Health Organization estimates that, worldwide, between 250,000 and 500,000 people die each year from flu-related ailments.

The flu virus carries its genetic material (RNA) inside a fatty membrane, but lacks its own cellular structure or metabolism. It can replicate only by invading a living cell, plundering it to make multiple copies of itself and then escaping the devastated host.

Meanwhile, the virus can shuffle its genes with those pillaged from both human and animal hosts. This abrupt re-assortment is called antigenic shift.

Antigens are proteins on the surface of the flu virus. When these antigens—antibody generators—enter the body, the immune system deploys antibodies, warrior molecules, to fight back.

But if the immune system doesn’t recognize a new flu antigen, it may get overwhelmed.

“The [viral] RNA segments are like mini-chromosomes,” said Palese. “If you have two of these viruses that infect the same cells, one can get an exchange of these RNA segments...There’s a lot of genetic exchange possible and that is giving rise to what we refer to as pandemic influenza viruses.”

Such an antigenic shift occurred in the spring of 2009, when a flu virus with a new combination of genes emerged and quickly spread, causing a pandemic (worldwide epidemic).

The flu virus can also make less ominous changes continually over time (“antigenic drift”), affording scientists time to track these mutations and then update annual vaccines. This is why people who want to be protected need a flu shot every year.

Lessons of History

Two flu virus antigens control its infectivity: hemagglutinin (H) and neuraminidase (N). Palese outlined the genetic subtypes and an overview of influenza viruses, both human and animal.

He included the 1918 virus, “based on Jeffery’s sequence, which he obtained by very elegantly sequencing material from patients who died at that time.” (Dr. Jeffery Taubenberger of NIAID was present in the audience.)

“In collaboration,” Palese continued, “we were able to actually reconstruct in the laboratory such a virus. So this virus is extinct, but the H1N1 from 1918 has given us a lot of information why the pandemic virus was so bad. This is sort of a hallmark...up to 100 million people died in this 1918-1919 pandemic.

“By learning about what the 1918 virus was, we’re in a much better position now to be prepared if something else of that ilk would happen.”

A New Approach

Current flu vaccines are based on inactivated viruses containing H proteins from the virus’s “mushroom” head, which changes year to year. When we receive a flu shot, our immune system creates antibodies to fight these specific antigens. This approach is effective, especially when the vaccine strain closely matches the circulating virus.

Palese’s new strategy redirects the immune response away from the H in the head toward the H and N in the stalk, where they remain more constant over time.

Employing animal models, Palese and his team used experimental vaccine strains with chimeric (lab-engineered) H proteins never encountered by humans under natural conditions. These constructed antigens stimulated both mouse and

ferret immune systems to remember H and N proteins found in the stalk and offered good protection against potential pandemic viruses like H5N1 and H7N9.

The goal is to create a human vaccine with broad spectrum protection against a variety of antigenic drift and shift strains.

Palese reminded the audience that “this is not yet a vaccine...It has to go first to phase I, phase II, phase III [clinical trials].

“So clearly, the idea of a universal vaccine is that we don’t have to vaccinate every year. We would hope that based on the change which we’ve seen in the stalk, we would love to suggest it would last 20 years, or even for a lifetime.”

PHS Nursing Recognition Day Held at NIH

The 23rd annual Public Health Service Nursing Recognition Day was held recently at Natcher Conference Center. The event enables nurses to come together, learn from each other and recognize accomplishments. This year’s theme was “Moving Nursing Forward: Connecting the Dots for Our Future.”



Nurses from multiple government agencies, private and public sectors and academia attended. Guests included acting surgeon general Radm. Boris Lushniak, PHS chief nurse officer Radm. Sylvia Trent-Adams and Radm. (ret.) Carol A. Romano, associate dean for academic affairs, Graduate School of Nursing, Uniformed Services University of the Health Sciences.

Lushniak spoke of the essential role nurses play in health care. Keynote speaker Dr. Stephanie L. Ferguson, director of the International Council of Nurses’ Leadership for Change Program, extolled the value and power of nursing education and leadership. Her presentation visibly moved the crowd, incorporating the refrain, “I am a nurse and a leader.” Attendees were left with a palpable sense that, through continual education and strong leadership, anything is possible in the nursing profession. The morning ended with a commemoration of the 70th anniversary of the U.S. Cadet Nurse Corps. Attending were several original members of the corps and their families. These nurses played a vital role in ensuring that the health of the nation was preserved during World War II and years afterwards.

Rutter To Lead NIDA Division

Dr. Joni Rutter is new director of NIDA’s Division of Basic Neuroscience and Behavioral Research. The division supports basic biomedical and behavioral research to address the public health problem of drug addiction, including the neurobiological and behavioral mechanisms of drugs of abuse and their consequences.



Rutter’s career spans 15 years of basic and clinical research in human genetics and the study of genetic and environmental risk factors in the fields of cancer and addiction. She has earned a national and international reputation for her diverse and unique expertise in more than 50 publications in journals. She is the recipient of several scientific achievement awards, including a SmithKline Beecham Student Award in pharmacology, a Janssen Research Foundation Young Investigator Award and a Fellowship Achievement Award from the National Cancer Institute. Rutter has also built, supported and maintained the NIDA Genetics Consortium, a group of more than 20 investigators who study addiction genetics.

Prior to joining NIDA in 2003, Rutter received her Ph.D. from the department of pharmacology and toxicology, Dartmouth Medical School. Upon completing her doctoral degree, she remained at Dartmouth Medical School as a research associate. She then accepted a fellowship at NCI within the Division of Cancer Epidemiology and Genetics to fortify her training in human genetics. Her scientific objective is to integrate genetic principles with the study of how drugs and chemicals act on the brain.

NIDA’s Khalsa Receives Lifetime Service Award

NIDA’s Dr. Jag Khalsa (r) recently received the Lifetime Service Award from the Society of NeuroImmune Pharmacology (SNIP) in New Orleans, during the 20th SNIP annual meeting. Shown presenting the award is Dr. Sabita Roy, SNIP past president. Khalsa is chief of the Medical Consequences of Drug Abuse and Co-occurring Infections Branch in the Division of Pharmacotherapies and Medical Consequences of Drug Abuse. He manages activities and resources of the branch, including domestic and international research on medical/health consequences of drug abuse and co-occurring infections including HIV, hepatitis C/B, STDs/STIs and others. He is trained in neuropharmacology, toxicology and epidemiology. In May, he celebrated 50 years of work on drug abuse research. Khalsa holds a master’s degree in pharmacology/pharmacognosy and a Ph.D. in pharmacology. He has been with NIDA for more than 27 years and is a recipient of numerous awards of merit from the FDA commissioner, director of FDA’s Bureau of Foods, NIDA and professional societies.





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Bionic Vision Coming More Into Focus

In laboratory tests, researchers have used electrical stimulation of retinal cells to produce the same patterns of activity that occur when the retina sees a moving object. Although more work remains, this is a step toward restoring natural, high-fidelity vision to blind people, the researchers say. The work was funded in part by NIH.

Just 20 years ago, bionic vision was more a science fiction cliché than a realistic medical goal. But in the past few years, the first artificial vision technology has come on the market in the United States and Western Europe, allowing people who've been blinded by retinitis pigmentosa to regain some of their sight. While remarkable, the technology has its limits. It has enabled people to navigate through a doorway and even read headline-sized letters, but not to drive, jog down the street or see a loved one's face.

A team based at Stanford University is working to improve the technology by targeting specific cells in the retina—the neural tissue at the back of the eye that converts light into electrical activity.

“We've found that we can reproduce natural patterns of activity in the retina with exquisite precision,” said Dr. E.J. Chichilnisky, a professor of neurosurgery at Stanford. The study was published in *Neuron* and was funded in part by NEI and NIBIB.

MDMA Can Be Fatal in Warm Environments

A moderate dose of MDMA, commonly known as Ecstasy or Molly, that is typically nonfatal in cool, quiet environments can be lethal in rats exposed to conditions that mimic the hot, crowded, social settings where the drug is often used by people, a study finds. Scientists have identified the therapeutically relevant cooling mechanism to enable effective interventions when faced with MDMA-induced hyperthermia. The study, published June 4 in the *Journal of Neuroscience*, was conducted by researchers at NIDA.

While MDMA can have a range of adverse health effects, previous studies have shown that high doses of MDMA increase body temperature, while results with moderate doses were inconsistent. This has led some people to assume that the drug is harmless if taken in moderation. However, this study shows that in rats even moderate doses of MDMA in certain environments can be danger-

ous because it interferes with the body's ability to regulate temperature.

“We know that high doses of MDMA can sharply increase body temperature to potentially lead to organ failure or even death,” said NIDA director Dr. Nora Volkow. “However, this current study opens the possibility that even moderate doses could be deadly in certain conditions.”

Shining a Light on Memory

Using a flash of light, scientists have inactivated and then reactivated a memory in genetically engineered rats. The study, supported by NIH, is the first cause-and-effect evidence that strengthened connections between neurons are the stuff of memory.

“Our results add to mounting evidence that the brain represents a memory by forming assemblies of neurons with strengthened connections, or synapses,” explained Dr. Roberto Malinow of the University of California, San Diego, an NIMH grantee. “Further, the findings suggest that weakening synapses likely disassembles neuronal assemblies to inactivate a memory.”

Malinow, Dr. Roger Tsien, an NINDS grantee, and other UCSD colleagues reported June 1 in the journal *Nature* on their findings using cutting-edge optical/gene-based technology.

“Beyond potential applications in disorders of memory deficiency, such as dementia, this improved understanding of how memory works may hold clues to taking control of runaway emotional memories in mental illnesses, such as post-traumatic stress disorder,” said NIMH director Dr. Thomas Insel.

Physical Activity Can Help Maintain Mobility in Older People

A carefully structured, moderate physical activity program can reduce risk of losing the ability to walk without assistance, perhaps the single most important factor in whether vulnerable older people can maintain their independence, a study has found.

Older people who lose their mobility have higher rates of disease, disability and death. Research has shown the benefits of regular physical activity for a variety of populations and health conditions. But none has identified a specific intervention to prevent mobility disability.

In a large clinical study supported by NIH, researchers found that a regular, balanced and moderate physical activity program followed for an average of 2.6 years reduced the risk of major mobility disability by 18 percent in an elderly, vulnerable population.

Results were published online May 27 in the *Journal of the American Medical Association*.

EDI Hosts ‘Think Big’ Seminar, July 16

Join the Office of Equity, Diversity and Inclusion for an empowerment seminar, “Think Big or Stay Where You Are,” on Wednesday, July 16 from 11 a.m. to 12:30 p.m. in Wilson Hall, Bldg. 1. Cynthia Dunn, director of equity, diversity & inclusion at the Internal Revenue Service, will be the facilitator. The seminar will provide additions to your career development tool kits. The training will cover the importance of taking control of your career and the benefits of having an individual development plan, mentors and shadowing/detail assignments. Also, the training will address how to identify barriers that may impede your ability to move forward in your career and strategies to overcome those obstacles.

The event is sponsored by EDI’s Black, Asian American and Pacific Islander, and Native American portfolios. Sign language interpreters will be provided. For more information, contact Victoria Gross, (301) 451-0746, Victoria.Gross@nih.gov or the Federal Relay Service at 1-800-877-8339.



NIAMS Hosts Career Forum

NIAMS recently hosted a career development forum for extramural researchers who are in the third year of a mentored clinical scientist development (K08) or patient-oriented research (K23) grant. In addition to the K awardees, the forum included physician-scientists who recently received R01 awards and established researchers who held an open discourse on the challenges junior investigators face when pursuing research independence. It also provided an opportunity for K awardees (shown above) to interact with NIAMS program officials. These included Drs. Amanda Boyce (front, second from l) and Marie Mancini (front, third from l) and NIAMS leaders including director Dr. Stephen Katz (front, c), deputy director Dr. Robert Carter (front, third from r) and Dr. Susana Serrate-Sztein (second row, third from r).



Children’s Inn Play Park Receives Award

The firm that designed the play park at the Children’s Inn at NIH recently won an award from the Maryland chapter of the American Society of Landscape Architects.

Mahan Rykiel Associates, a Baltimore-based landscape architecture, urban design and planning firm, redeveloped an outdoor space for patients, their siblings and caregivers. It accommodates active and passive functions and provides enriching play areas for a variety of age groups, plus respite space for families and staff.

“The new play area offers our children and their families a real chance to enjoy the outdoors, and

when children have an opportunity to play, they also have an opportunity to heal,” said Kathy Russell, inn CEO.

Solving drainage problems and reducing the grade change between the outdoor area and the building were reasons for redesigning the play space. Lead designer Alice Jones said, “Now, as soon as you walk in and see out those floor-to-ceiling windows, you know there’s something cool out there.”

Outdated play equipment and lack of shade in the old play garden also contributed to limited use by the kids.

The award was presented at a ceremony in Baltimore recently.

Above: Before (l) and after views of the Children’s Inn play park—outdated play equipment and lack of shade in the old play garden contributed to limited use by the kids. The redeveloped outdoor space recently won acclaim from landscape architects.

'Right on Time' Wins Basketball Tourney

PHOTOS: ERNIE BRANSON

"Right on Time" beat "Get Well" 26-18 to win the 4th annual Spring into Health Three-on-Three Basketball Tournament. The 13-team, single elimination tournament took place May 28 at the Bldg. 10 sports court behind Lipsett Amphitheater.

"It was a total team effort, everyone on the team contributed to us being victorious," said OD's Casey Hargrove, Right on Time's captain. "There were no easy games, and we are ready to come back next year and defend our title." His teammates included NIAID's Sabrina Mangat, OD's Chris Farley and OD's Lindel Schuyler.

Before each game, a referee flipped a coin to determine which team received the ball first. Once the game began, the referee kept score, called fouls and watched the clock. All baskets were worth 2 points and each game lasted 20 minutes. Every team had to include at least one female. And every team could have as many as two substitutes who could enter the game at any time.

The tournament was part of the Spring into Health Initiative. The month-long effort included several free physical fitness classes. The activities were part of NIH's commitment to the HealthierFeds initiative.

The Office of AIDS Research, in partnership with the Office of the Director, the Office of Research Services and the Division of Amenities and Transportation Services sponsored the tournament.—Eric Bock



The winning team Right on Time included (above, from l) Sabrina Mangat, Casey Hargrove, Chris Farley and Lindel Schuyler.



The action was intense at the Bldg. 10 sports court, as the photos above show. Above, OD's Woleola Akinso (l) takes the rock to the rack. At right, runner-up Get Well included (from l) Bako Orionzi, Aaron Trefler and Nima Khoshab—all of NIMH—and NHLBI's Jan Lanzer.