

Antibiotic Use, Resistance Threaten Global Health

BY DANA TALESNIK

The problem isn't new. Scientists observed antibiotic resistance 75 years ago, before penicillin was ever used. However, as antibiotic use rises rapidly worldwide, resistance continues to climb. It is now a burgeoning public health threat. How can we conserve these miracle drugs so they continue to fight disease and save lives?

"We started having a significant health burden associated with resistance only in the 2000s, and that has contributed in large part to the advocacy and to the policy action—at least to the talk of policy action—that we hear today," said Dr. Ramanan Laxminarayan,

an economist and epidemiologist who is director and senior fellow, Center for Disease Dynamics, Economics & Policy. He spoke to a packed Lipsett Amphitheater at NIAID's John Ring LaMontagne Memorial Lecture recently.

Antibiotic use has risen by more than 36 percent in 72 countries from 2000 to 2010. Rising incomes—especially in such emerging economies as Brazil, Russia, India, China and South Africa—largely account for the growing global access to antibiotics. And high-income countries remain large consumers; U.S. per capita antibiotic consumption, for example, is double that of India and triple that of China, said Laxminarayan.

The fact that more people have access to antibiotics than ever before would be a beneficial trend if they were always used correctly. But rampant overuse and misuse of



Dr. Ramanan Laxminarayan speaks at NIH.

SEE RESISTANCE, PAGE 8



Nats Park hosted NIH'ers recently; see p. 12.

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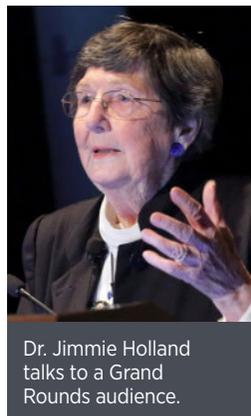
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Positive Outlook on Life Key To Healthy Aging

BY ERIC BOCK

Aging isn't as bad as it seems. Sure, there are downsides to growing older. But, on average, seniors report a better quality of life than people much younger, said Dr. Jimmie C. Holland at the Contemporary Clinical Medicine: Great Teachers Grand Rounds Lecture in Lipsett Amphitheater recently.

"Life doesn't actually get better, but you perceive it differently, and with greater gratitude," said the 88-year-old Holland, an attending



Dr. Jimmie Holland talks to a Grand Rounds audience.

SEE AGING, PAGE 4

NIH'ers Bike to Work in Droves, Once Again

BY RICH MCMANUS

Only one thing has to happen for Bike to Work Day to be a success at NIH, because all the other stuff—the preparation, the enthusiastic participation, the free T-shirt stand, the bagels, juice and coffee—have already been taken care of by the NIH Bicycle Commuter Club and the ORS Division of Amenities and Transportation Services. And that is for the sun to come out.



NEI's Dr. Brian Brooks clearly has the right attitude about riding in BTWD.

SEE BTWD, PAGE 6

Little To Give Next 'Mind the Gap' Seminar, June 29

Dr. Todd D. Little, director of the Institute for Measurement, Methodology, Analysis and Policy and professor of educational psychology and leadership at Texas Tech University, will speak on "Optimizing Inferences Using Principled Missing Data Treatments" at the Office of Disease Prevention's next Medicine: Mind the Gap seminar. It will be held Wednesday,



June 29 from 11 a.m. to noon via NIH VideoCast, <http://videocast.nih.gov/>.

Missing data present a common problem for prevention research; improperly handling missing data can severely compromise the validity of a study's inferences. Little will highlight the power and utility of modern principled treatments for missing data to optimize inferences. He is internationally recognized for his quantitative work on various aspects of applied structural equation modeling, as well as his substantive developmental research.

Little will accept questions before and during his presentation via email at prevention@mail.nih.gov and on Twitter with #NIHMTG.

Safety, Health & Wellness Day Set

NIH Safety, Health and Wellness Day will be held Wednesday, June 22, rain or shine, at the Clinical Center south complex from 10:30 a.m. to 2 p.m. Everyone is welcome to come learn about safety, health and wellness opportunities at NIH.

The Office of Research Services, Office of Research Facilities, NIH occupational safety and health committee, laboratory sustainability group and the National Institute of Allergy and Infectious Diseases are combining efforts to increase workplace health awareness and promotion.

Each year, the event gets bigger. This year's version will include activities such as health screenings, IC exhibits, heart-saver CPR training demonstrations, a farmer's market, physical fitness activities, adult dependent and elder-care information, nutrition demonstrations and tastings and much more.

Attendees are encouraged to register for this event, including the fitness classes, by visiting <https://nih2016.eventbrite.com>. Fitness classes will fill fast, so sign up as soon as you can.

More than 50 exhibitors will showcase nutrition, fitness and occupational health and wellness information and activities. Plan to have lunch and choose from specialty food trucks that will serve a variety of cuisines for purchase.

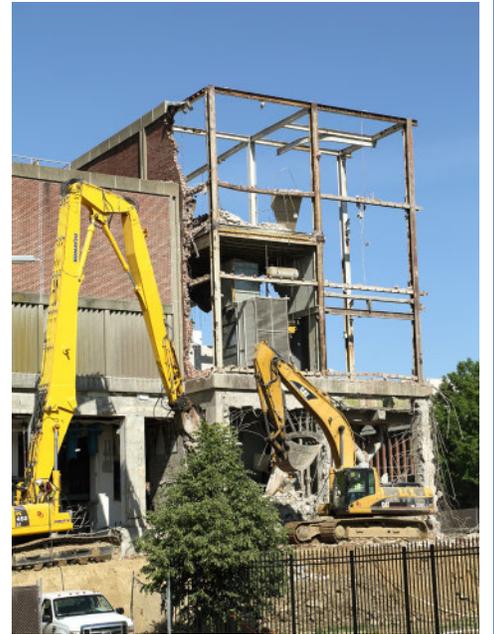
For more information, visit <http://go.usa.gov/>



Demolition of Bldg. 34 Continues

Bldg. 34, the old campus utility plant, is now being demolished to make way for the new Thermal Energy Storage (TES) System, which will feature an 8-million-gallon water tank 100-feet high and 120-feet wide. The top image shows near-complete demolition of the old section of Bldg. 34. Still upright is the newer section of the building (34A), awaiting complete demolition in June. The TES, along with the industrial water storage system—a 5-million-gallon water tank standing 65-feet high and with the same diameter as the TES—will increase the efficiency and reliability of the NIH Central Utility Plant and ensure that NIH research and patient care can continue uninterrupted if there is an unexpected power outage or disruption in public utility services.

PHOTOS: BILL BRANSON



cuWR4. Individuals who need interpreting services may contact Carole Harman at (301) 402-8180. For other reasonable accommodation, contact Alan Marcus at (301) 827-5558 and/or the Federal Relay, (800) 877-8339.

Graduate & Professional School Fair Scheduled

July 14

The NIH Graduate & Professional School Fair will be held on Thursday, July 14 from 8:45 a.m. to 3:30 p.m. at Natcher Conference Center.

The fair provides an opportunity for NIH summer interns (especially those in college) and postbacs, as well as other college students in the D.C. area, 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 outstanding colleges and universities

from across the U.S. will send representatives from graduate schools, medical and dental schools, schools of public health and other biomedically relevant programs to the fair in hopes of recruiting NIH trainees.

The day will also include workshops on getting to graduate and professional school, M.D./Ph.D. programs, interviewing, careers in public health, computational biology/bioinformatics, psychology and dentistry. Exhibits will be open from 9:45 a.m. to 2:15 p.m.

A list of institutions planning to attend and registration information can be found at https://www.training.nih.gov/gp_fair.

President Honors 20 NIH-Supported Early Career Scientists

On May 5, President Obama honored 20 NIH-supported scientists for their innovative research and contributions to medicine and health. They were among 105 researchers who received the Presidential Early Career Awards for Scientists and Engineers (PECASE), the highest honor bestowed by the federal government to outstanding early career scientists and engineers.

“The PECASE awardees are truly remarkable young scientists,” said NIH director Dr. Francis Collins. “NIH is proud to support 20 recipients, and we look forward to the many biomedical breakthroughs their careers are certain to produce.”

Of 20 NIH-supported awardees, two are intramural investigators:

Dr. Katie Kindt, acting chief of NIDCD’s section on sensory cell development and function, was recognized for studies on disorders in mechanosensation including hearing, balance and touch.

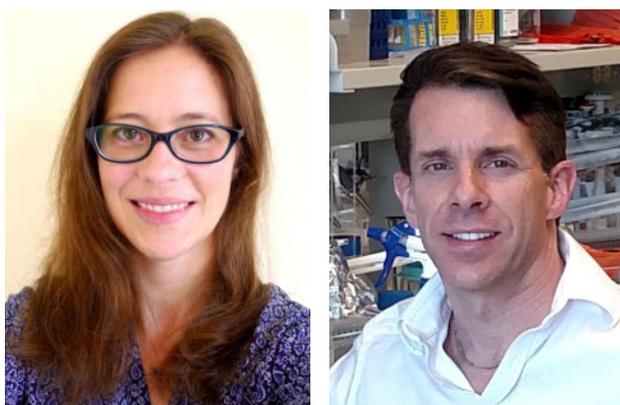
Dr. Andre Larochelle, an NHLBI investigator, was cited for gene and stem cell-based regenerative therapies that can potentially restore lost, damaged or aging cells and tissues in the human body. His team is focusing on inherited disorders affecting blood-forming hematopoietic stem cells.

Grantee winners include: Dr. Hillel Adesnik, University of California, Berkeley; Dr. Samantha Brugmann, Cincinnati Children’s Hospital Medical Center; Dr. Namandje Bumpus, Johns Hopkins University; Dr. Kafui Dzirasa, Duke University; Dr. Camilla Forsberg, University of California, Santa Cruz; Dr. Tina Goldstein, University of Pittsburgh; Dr. Viviana Gradinaru, California Institute of Technology; Dr. Jordan J. Green, Johns Hopkins University; Dr. Jennifer Lorvick,



President Barack Obama joins recipients of the Presidential Early Career Award for Scientists and Engineers for a group photo in the East Room of the White House on May 5.

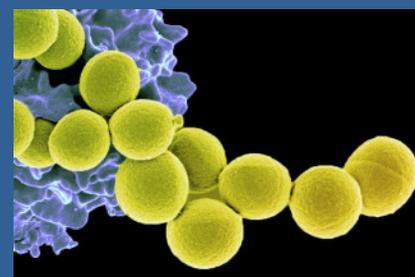
PHOTO: LAWRENCE JACKSON



NIDCD's Dr. Katie Kindt (l) and NHLBI's Dr. Andre Larochelle

Research Triangle Institute International; Dr. Courtney Miller, Scripps Research Institute; Dr. Kiran Musunuru, Harvard University; Dr. David J. Pagliarini, University of Wisconsin; Dr. Sachin Patel, Vanderbilt University; Dr. Amy Ralston, Michigan State University; Dr. Ervin Sejdic, University of Pittsburgh; Dr. Elizabeth Skidmore, University of Pittsburgh; Dr. Kay Maxine Tye, Massachusetts Institute of Technology; Dr. Muhammad Walji, University of Texas Health Science Center, Houston.

“We congratulate these accomplished individuals,” said Obama, “and encourage them to continue to serve as an example of the incredible promise and ingenuity of the American people.” 



ON THE COVER: *Methicillin-resistant Staphylococcus aureus*, or MRSA, bacteria bound to a neutrophil, a type of white blood cell

IMAGE: NIAID

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Turning Discovery Into Health

Aging

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psychiatrist and Wayne L. Chapman chair in psychiatric oncology at Memorial Sloan Kettering Cancer Center. “As my husband, Jim, who has been ill the last couple of years, often says, ‘I’m glad to be here. I’m glad to be anywhere.’”

This is true in every country in which studies have been done, including both developed and developing countries.

One study in the U.S. asked 350,000 people to rate their well-being on a scale from 1 to 10. Well-being is high in our twenties, but it goes steadily down to a nadir at 55, when responsibilities for aging parents, children and career expectations peak. By middle age, she said, “People get distressed and down. They think, ‘If it’s this bad at 50,



Holland said that from 60 and older, people accept mortality and begin to appreciate life and its joys, making the most of each day.

PHOTOS: ERNIE BRANSON

that has been validated not only to lower loneliness, depression and distress, but also to increase patients’ sense of meaning and purpose.

It has also been found in other studies

★ ★ ★

“We’re all aging one day at a time. But it’s better to call it living one day at a time and making the most of it.”

—DR. JIMMIE HOLLAND

★ ★ ★

by 75, I will be done in.’ However, from 60 and older, people accept mortality and begin to appreciate life and its joys, making the most of each day.

Holland concedes there are problems with aging. Senior citizens have a higher risk for cancer, diabetes and heart disease. They gain weight easily, fall down more often and are often stigmatized; many are socially isolated.

“We can’t move around quite as well as we did, our bones creak a little more and we must deal with losses of family members and friends,” she explained.

She became interested in aging 10 years ago when she was part of a study of older patients receiving chemotherapy. They were divided into two groups. One received a booklet about coping and the other received monthly phone calls for 6 months, simply to check on their mental status. Afterwards, the group that received phone calls reported decreased depression, loneliness and anxiety. Asked what was helpful, they said, “Someone cared about me between the visits to the oncologist.” This led Holland and her group to develop a telephone psychotherapy

that people with a sense of purpose have a slower decline in cognitive ability than those without one, she said. Having a sense of humor is also important. “When you can’t change something, it helps if you can turn it around and laugh about it,” she said.



Dr. Jimmie Holland (r) was the third member of the Holland family to present at Grand Rounds. In 2013, her husband, Dr. James Holland (c) and their son Dr. Steven Holland (l) spoke at the CC’s 60th anniversary Grand Rounds lecture.

Holland follows her own advice. At the suggestion of one of her granddaughters, she began a book club for seniors 3 years ago, the Vintage Readers’ Club. The readings began with the Harvard Classics. The club meets monthly to eat lunch, talk about the reading and relate it to their lives. It has helped to stimulate them to think beyond themselves, both personally and socially. There’s only one rule: no complaining of aches and pains.

Keeping older Americans active and engaged has another benefit, noted Holland, which is economic. Estimates suggest elders hold \$25 trillion collectively in the U.S. In other words, they have great potential as consumers.

To experience that benefit, though, “we’re going to have to keep them healthy,” Holland said. By 2030, roughly 20 percent of the population will be over 65. The burdens



CC director Dr. John Gallin poses a question at Grand Rounds.

placed on the health care system will soon be enormous. Even today, the system is ill prepared to handle the medical needs of an aging population. Holland said hospitals “send people home sicker and quicker,” adding stress to younger family members who must take on extensive caregiving roles.

The foundation for healthy aging begins with a healthy attitude toward aging, which leads to better health habits, best cultivated before entering one’s golden years. If that can be done, she said, “You fare better when you’re older in terms of overall function and lower disability.”

For all these reasons, it’s better to look at aging from a positive perspective. “We’re all aging one day at a time. But it’s better to call it living one day at a time and making the most of it,” Holland concluded. **R**

Abecasis To Give Sayer Lecture, June 28

Dr. Gonçalo Abecasis will give the 9th Sayer Vision Research Lecture on Tuesday, June 28 at 2 p.m. at Natcher Conference Center. In his talk, “Sequencing Tens of Thousands of Human Genomes: Analytical Challenges and Opportunities,” he will discuss plans to analyze more than 50,000 deeply sequenced human genomes, corresponding to roughly 5 million billion bases of raw sequence data.

Abecasis, the Felix E. Moore collegiate professor of biostatistics at the University of Michigan’s School of Public Health, is a world-renowned leader in the design of statistical tools for analyzing enormous quantities of genetic data. His algorithms help geneticists realize the full potential of high-throughput technologies that are accelerating the pace of human genome sequencing.

Several hundred gene-mapping projects worldwide rely on software developed by Abecasis and his colleagues at Michigan’s Center for Statistical Genetics to better understand the role of complex disease susceptibility genes associated with a range of disorders from age-related macular degeneration to cardiovascular disease.

The Sayer Vision Research Lecture Series is given by a scientist of prominence in a discipline with relevance to vision research and is cohosted by NEI and the Foundation for the National Institutes of Health. The series is supported by the Sayer Vision Research Fund, established by Dr. Jane M. Sayer, a scientist with NIDDK, to honor her parents, Winthrop and Laura Sayer. The fund incorporates Sayer’s desire to contribute to groundbreaking medical research at NIH while raising the profile of vision research.



Dr. Gonçalo Abecasis

TO THE RESCUE

Wildlife Veterinary Volunteers Help Deer, Geese, Even the NIH Bear

Staff from the McGavern Laboratory on the 5th floor of the Clinical Center were concerned. It had been 3 days since a nest of 6 goslings had hatched on the NIH Library’s roof and mother and father seemed to be having trouble caring for them. Not sure who to call, they contacted the Maryland Department of Natural Resources for help. Although unable to come to campus, state officials suggested moving the goslings to the ground.

A call was made to Dr. Charmaine Foltz, director of the Office of Research Services’ Division of Veterinary Resources, and an NIH group called the Wildlife Veterinary Volunteers stepped into action. Dr. Garry Linton, the on-call veterinarian, with the help of Donald Edward and his team from the Office of Research Facilities, were able to relocate the goslings safely to the grass on the south side of Bldg. 10 where the parents quickly claimed the babies.

In the past, the NIH Police were called to deal with these wildlife issues. Not equipped to handle such incidents, the police would seek out the DVR, often after hours, or in the case of the NIH bear (who visited campus June 19, 2014), asking laboratory animal veterinarians to go beyond even their capabilities. To address the need, Dr. Terri Clark, director of the Office of Animal Care and Use, and Foltz recruited a group of compassionate vets on campus and established the Wildlife Veterinary Volunteers in 2015.

In the beginning, it was a loosely organized bunch. But in January, the volunteers established a 24-hour on-call schedule with the NIH operator. Last November, they also participated in training with wildlife biologist Dr. Anthony DeNicola and veterinary surgeon Dr. Steve Timm. These two were integral to the success of the deer management program recently instituted on campus, in which adult females are neutered.

The training included an overview of approaches and considerations for dealing with wildlife. In addition, two NIH police officers, along with DVR’s Tom Thomas and Kelly Prevost, participated in air dart rifle and pistol training in the event there is a need to anesthetize an animal from a distance.

The program has brought vets together from various ICs and developed a sense of comradeship. Wildlife Veterinary Volunteers are ready to save goslings from a roof. Or, having tackled the NIH bear, maybe next it will be a mountain lion! Ok...let’s hope not any time soon.—Brad Moss



Six goslings are reunited with their parents after being rescued from the NIH Library’s roof by NIH’s Wildlife Veterinary Volunteers on May 12.



Dominic Napoli, senior IT asset manager at NLM, shows off his Sondors Ebike. The bike has a 350-watt rear hub motor. Top speed is about 22 mph. At right, Dr. Maya Lodish and her daughter Talia Zimmerman, age 4, biked in together. Lodish is a staff clinician and directs NICHD's pediatric endocrinology fellowship.

PHOTOS: BILL BRANSON

BTWD

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So rare in May skies was the sun in 2016 that the first thing saluted by Dr. Vernon Anderson, president of the NIHBC, in brief remarks May 20 from the steps in front of Bldg. 1, was the lovely day.

His second salute was to this year's winner of the fifth annual Carl Henn Award, presented in memory of the longtime NIH'er and local bicycling activist who died in 2010.

Peter Chines, a computer scientist in NHGRI's molecular genetics section, won this year's honor. A daily bike commuter for the past 8 years—he used to take the bus but realized that biking was “much more fun”—he was cited by former NIHBC president Angela Atwood-Moore for a multitude of virtues.

“Peter serves so quietly,” said

Atwood-Moore. “He just does what needs to get done without fanfare. All have benefited from his championing of the Bike Bucks program. He rides, logs his miles and is one of the most visible cyclists on the road.”

Atwood-Moore used to run the Bike Bucks program, but did it manually. Chines automated the program and revitalized participation.

“That really has kept it going,” said Atwood-Moore. “Peter is always thinking about how to make it better and get more people to participate.”

To win a Henn Award, a cyclist needs nominations. Atwood-Moore said Chines distinguished himself on a number of grounds. “I've seen him whip out shears and lop off nuisance growth that most other cyclists just pass by,” she said. Chines is also known for organizing cold-weather Polar

Bear rides during the winter, to keep up bike commuters' spirits.

“He just does things simply, efficiently and quietly,” she concluded.

“I am honored and humbled,” said Chines. “I just continued the things folks before me have done to make bicycling at NIH so much better than it was before.” He cited bike storage facilities, the availability of showers and “a very supportive administration” as major campus bike commuter assets.

“[Chines] has been a steadfast member of the club forever,” said Joe Cox, ORS's chief of transportation services. “He has kept the Bike Bucks program alive over the years.”

Bike Bucks invites riders to log their commuting miles and earn coupons worth cash at a variety of vendors. Learn more at www.nihbike.com/home/bikebucks.

Also on hand at the Bldg. 1 BTWD pit



At left, Cpl. Brett Alexander, community policing coordinator with the NIH Police, registers a bicyclist at BTWD. At middle, minor bike repairs were handled by representatives from Silver Cycles and The Bicycle Place. At right, NIAID's Steve Bourque shows off some vintage “ape-hanger” handlebars.



Peter Chines accepts the Carl Henn Award from Angela Atwood-Moore.

stop were representatives of what Anderson called “our friendly neighborhood bike shops,” including Silver Cycles and The Bicycle Place, which offered raffle items and minor bike repairs. The Takoma Park Co-op contributed food and the Washington Area Bicyclist Association, which sponsors BTWD locally, had an information table.

Another amenity this year was a parked NIH shuttle bus outfitted with a grill-mounted bike rack. Anderson said it offered cyclists an opportunity to practice getting bikes on and off the racks.

NIH also sponsored two other BTWD pit stops, one near NCI-Shady Grove and the other at Rock Springs Business Park. According to the Metropolitan Washington Council of Governments, the final count was 601 NIH participants, including 466 at Bldg. 1. This was down slightly from 2015, when NIH had 617 registered participants.

“I believe people who normally start cycling in April haven’t got in the spirit yet because of all the rain and cool weather,” said Cox. “Hopefully it will pick up.”



Doing BTWD family-style are (from l) Houston Baker, Zoe Baker and Eva Baker. Houston is a program officer with the Cancer Imaging Program, NCI, and is Zoe’s grandfather. He has participated in multiple BTWDs, all of them with Zoe, age 6. Eva is a staff clinician in the CC’s department of radiology and imaging sciences. This was her 6th BTWD.

OBSERVING ASIAN AMERICAN HERITAGE

‘Diverse Career Pathways’ Panelists Discuss Roads to Success

BY LAURA WONG

Three senior NIH staff shared their personal career paths at a May 4 panel discussion—one of the NIH activities in observance of Asian and Pacific Islander Heritage Month. The audience of more than 50 gained insights on how to build a successful scientific or administrative career.

Robin Kawazoe stressed the importance of learning as much as you can. Embrace challenges that come your way, she said, and make them opportunities to grow. She started in extramural and policy committee management and over the years took on increasing responsibilities in science policy and communications (NIDA) and science policy and planning (OD). She later built up resource management experience at NIAAA. In her current position as deputy director of the NIH Division of Program Coordination, Planning & Strategic Initiatives, Kawazoe said her duties overlap the administrative and science spheres—workforce development; ethics; space management; and risk management, internal controls and crisis response. By learning and sharing knowledge, she emphasized, one becomes the “go-to” person who is valuable to one’s organization.

The second speaker, Dr. T. Jake Liang, transitioned from academia to NIH, where he currently serves as chief of the Liver Diseases Branch in NIDDK’s Division of Intramural Research. He stressed the value of being active in professional societies and in editorial work for scientific journals, which he has continuously done from the time he was assistant professor of medicine at Harvard Medical School (1990-1996).

Taking charge of one’s career path, Liang said, entails setting a goal: Be ambitious but realistic. Stay focused and always seek advice. Re-assess periodically to see if you are on track. Even when experiencing success, don’t sit on your laurels; start again and set a new goal. Always be respectful, honest and sincere, he said, because being principled is at the core of reputation and gaining peer support.

Even when situations are not ideal, it is important to avoid adversarial relationships. Life-long relationships, built in the workplace and in professional and social networks, are key to one’s career, Liang said, noting that the benefit goes in both directions.

The third speaker, Dr. Francisco Sy, described his path from academia to the Centers for Disease Control and Prevention to NIH, and then back to academia, after he retires as program director of the Division of Extramural Scientific Programs, NIMHD. His key message was to “be your own champion.”

At CDC, Sy was working in HIV/AIDS education and prevention when the 2003 SARS outbreak occurred in Asia. With little initially known about disease transmission, he felt it was important to mitigate fear and negative impact on Asian communities and businesses in the U.S. By volunteering to lead the CDC SARS community outreach team, he created an unanticipated opportunity.

Seeking out new knowledge can involve being an “intellectual risk taker,” he said. Moreover, even if culturally or personally one feels it awkward, being proactive and showing initiative is important. Sometimes, he said, one’s supervisor may simply be unaware that you might be interested in taking on a project.

Echoing the other speakers, Sy urged each person to continually assess where one is, while mapping out a plan to reach one’s goal. He added that a leader promotes participation, consensus and teamwork among colleagues.

A brief question and answer period concluded the panel discussion, which was co-sponsored by the NIH Asian & Pacific Islander American Organization (APAO) and the NIH Office of Equity, Diversity and Inclusion.



Participating on the panel are (from l) APAO president Dr. Francisco Sy (NIMHD), Robin Kawazoe (OD), APAO vice-president and facilitator Lucie Chen and Dr. T. Jake Liang (NIDDK).

PHOTO: PHUONG-TU LE

Resistance

CONTINUED FROM PAGE 1

these vital drugs, in people and animals, have contributed to the dangerous rise of drug-resistant bacteria. And when antibiotics stop working, it becomes harder to fight serious, sometimes deadly, bacterial infections.

Some of the most stubborn infections come from the Gram-negative pathogens such as carbapenem-resistant *Klebsiella*, prevalent in China, India and Vietnam. MRSA and other resistant staph infections are rampant and still on the rise in Latin America and sub-Saharan Africa. Throughout Europe, *E. coli* infections are becoming harder to treat, having become resistant to newer antibiotics, and strep pneumoniae is also spreading rapidly. Globally, there already are more than 900 beta-lactamase enzymes that have been detected, which contribute to resistance to such mainstay antibiotics as penicillin.

Among the hardest hit populations are

health [measures, such as fluorinated water] reduce the burden of infectious diseases,” said Laxminarayan. “But many other countries are using antibiotics not as a complement to public health but really as a substitute for public health.” He emphasized the need for access to clean water and better sanitation and infection control worldwide.

Reining in the improper use of antibiotics would dramatically reduce the global health burden of resistance. In some countries, notably India and Kenya, antibiotics are commonly sold without a prescription. In China, hospitals rely on antibiotic sales for

said Laxminarayan. And new antibiotics won't solve the problem for long because resistance arises to every antibiotic just a few years after it's introduced.

“We have to keep in mind that a lot of people may not be able to afford those newer antibiotics, so the loss of first-line drugs always increases the costs,” he said.

Luckily, many of our existing antibiotics do still work.

“If we spend a lot of public money trying to find new antibiotics, we are effectively dis-incentivizing people from using existing antibiotics appropriately,” said Laxminarayan.

He called for educating health professionals and the public about the need to use antibiotics appropriately and not demand them from doctors. Improving water, sanitation and immunization worldwide could help. So could providing incentives that encourage antibiotic stewardship and hospital infection control and the use of rapid diagnostics to prevent the unnecessary prescribing of antibiotics. He also advocated reducing, and eventually eliminating, sub-therapeutic antibiotic use in livestock.

“What we are dealing with is not just a problem of antibiotic resistance but really a problem of access to effective antibiotics, which many of us take for granted,” said Laxminarayan. “And the real tragedy will be when those people who currently don't have access will finally be able to afford an antibiotic, [and] that antibiotic will not work for them, not because they overused the antibiotic, but because the rest of us did.” **R**

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“What we are dealing with is not just a problem of antibiotic resistance but really a problem of access to effective antibiotics, which many of us take for granted.”

-DR. RAMANAN LAXMINARAYAN

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babies, children and seniors. Newborns are particularly at risk in developing countries where the mortality rate is high from neonatal sepsis, said Laxminarayan. In India, 58,000 babies die annually because of antibiotic resistance. In the United States, more than 100,000 seniors contract resistant infections annually, thousands of them fatal, while undergoing common surgical procedures.

But in developing countries, “lack of access [to antibiotics] very likely still kills more people than antibiotic resistance does,” said Laxminarayan, especially young children who often don't get vaccinated. Vaccines reduce penicillin-susceptible disease and protect the most vulnerable populations, so it's urgent to expand access to vaccines and reserve antibiotics for those who need them most.

“In the West, antibiotics were used as a mop-up operation after we've had public

much of their revenue, so there's no incentive to reduce consumption. Around the world, antibiotics are incorrectly prescribed during the annual flu season.

Meanwhile, another major impetus for antibiotic resistance is the increased use of growth-promoting antibiotics in livestock. Some 63,000 tons of antibiotics were consumed in livestock in 2010, said Laxminarayan, and the amount is projected to rise by 67 percent between 2010 and 2030. The daily low-level, or sub-therapeutic, dosing to fatten livestock doesn't actually promote much growth, he said, but it does accelerate drug resistance. And studies show that antibiotics may be unnecessary to prevent disease if there's good herd hygiene, nutrition, sanitation and veterinary care.

“If we don't conserve the antibiotics we have, we will have to rely on new antibiotics that will be inevitably more expensive to develop and bring to market,”



“If we don't conserve the antibiotics we have, we will have to rely on new antibiotics that will be inevitably more expensive to develop and bring to market,” said Laxminarayan.

PHOTOS: BILL BRANSON

NIBIB Showcases Biomedical Tech for Congressional Staff

BY RAYMOND MACDOUGALL

A hand-held ultrasound needle-guidance device, cuffless blood pressure monitor and brain-wave sensor were among the technologies exhibited for about 30 congressional staff members who visited the National Institute of Biomedical Imaging and Bioengineering recently. The NIBIB Discoveries in Technology Expo drew staff from congressional offices of members from California, Colorado, Florida, Indiana, Massachusetts, Mississippi, North Carolina, Nebraska, New Jersey, New York, Ohio, Pennsylvania, Texas and South Carolina.

“We provided a powerful, first-hand look at some remarkable biomedical technologies,” said NIBIB director Dr. Roderic Pettigrew. “Each technology has been developed with NIBIB support and has the potential to enhance health care delivery or catalyze biomedical research. The technology expo gives our visitors the opportunity to become as excited as we are about these new biomedical devices and approaches.”

The American Institute for Medical and Biological Engineering, which plays an advocacy role for the fields of medicine and biological engineering, arranged the congressional field trip, held at the Porter Neuroscience Research Center.

The event featured hands-on demonstrations of tech advances being made with NIBIB support. In addition, there was a tour of NIBIB’s Laboratory of Molecular Imaging and Nanomedicine (LOMIN).

To give patients control over their own medical images, the Radiological Society of North America (RSNA) Image Share platform allows seamless access to and sharing of images such as MRIs, CT scans and X-rays. The online system, as demonstrated by an RSNA representative with the Icahn School of Medicine at Mount Sinai, is designed to give patients easy image access regardless of the location of patient or provider.

Recipients of an NIBIB-funded Small Business Innovative Research grant demonstrated a handheld ultrasound device that anesthesiologists can use while administering epidural anesthesia to the spine. The device helps locate the precise spot for needle insertion and is particularly helpful for women in childbirth and patients for whom obesity makes finding the precise epidural target especially difficult. Rivanna Medical, based in Charlottesville, Va., developed the device, which received Food and Drug Administration clearance in July 2015 and now is being marketed to hospitals.



At left, NIBIB director Dr. Roderic Pettigrew points to a display on which words are generated from a participant’s brain waves via computer interface during the NIBIB Discoveries in Technology Expo. At right, NIBIB intramural investigator Dr. Shawn Chen provides visiting congressional staff with a description of nanoprobe developed at the NIBIB Laboratory of Molecular Imaging and Nanomedicine for disease diagnosis and monitoring therapeutic response.



The traditional tool for measuring blood pressure has remained largely unchanged for decades. A team from Michigan State University demonstrated cuffless blood pressure measurement systems to non-invasively measure blood pressure, ideally in the home. These devices could make blood pressure measurement as easy as stepping onto a scale and will therefore help improve diagnosis and management of hypertension.

A New York-based research team demonstrated a cap that can capture brain-wave signals of the wearer and use them to operate a computer. The system is designed to help people with paralysis complete everyday tasks independently. A number of people with severe disabilities already are using the system in their homes. The research team is based at the New York State department of health; the National Center for Adaptive Neurotechnologies, Wadsworth Center; and Stratton VA Medical Center.

No visit to NIH is complete without a laboratory tour. LOMIN opened its doors to demonstrate positron emission tomography (PET) radiochemistry

and analytical chemistry approaches to improve health care. The lab develops new imaging nanoprobe for PET and other imaging modalities. The probes are designed to improve early diagnosis of disease, monitor therapeutic response and guide drug discovery and development.

NIBIB’s Office of Science Policy and Communications, which coordinated the event with AIMBE organizers, also presented a demonstration. They previewed a mobile app now in development called Understanding Medical Imaging Scans. The app uses images and videos to provide concise answers that many patients may have about medical scans and will serve as a resource to explain the kinds of imaging tests a patient or family member might encounter during disease diagnosis or treatment. The app will soon be beta-tested before becoming available in waiting rooms of doctors and hospitals. The app will be kept updated as biomedical imaging technologies, like the technologies demonstrated at the expo, are continually innovated and introduced. **R**



Japanese Ambassador Visits NIH

Ambassador Kenichiro Sasae of Japan and his wife Nobuko visited NIH on the morning of May 11, meeting administrative and scientific leaders in Bldg. 1 then visiting the Clinical Center for a tour and roundtable meeting with Japanese investigators working at NIH. At left above, the ambassador (r) meets with NIH principal deputy director Dr. Lawrence Tabak. At right, Sasae (l) and his wife (r) are joined by (from l) scientific directors Dr. Alan Koretsky (NINDS), Dr. Robert Balaban (NHLBI), Dr. Tom Misteli (NCI) and NIH deputy director for intramural research Dr. Michael Gottesman. The guests from Japan also visited with some 300 Japanese scientists working at NIH, including members of the NIH Japanese Fellows Association.

PHOTOS: BILL BRANSON

Campus Recycling Program Has Come a Long Way

BY ARIELL LAWRENCE

Back in 1990, an *NIH Record* article about recycling on campus concluded, “Consciousness needs to be raised here on waste issues. There is a continual need to remind workers about proper waste management and reduction.”

Since then, a variety of improvements have been made. In 1997, it became evident that “enthusiastic participation of the floor coordinator” is critical to the successful expansion of the NIH Recycling Program.

A 2006 finding from a leased facility assessment read, “There is a need for a ‘recycling coordinator’ in each area of the building. This may be an entire floor in a building, a division or a department. There should also be a building coordinator.”

The Bethesda campus once had a network of recycling floor and area coordinators. Though volunteers, they were analogous to safety specialists belonging to the Division of Occupational Health and Safety and Division of Logistic Services’ property accountability and custodial officers.

In 2012, an NIH employee put forth this request via a survey: “Make recycling tutorial required training just like ethics and IT security.”

An NIH employee suggested in a 2016 study that recycling information be communicated via department leads.

Recycling can be confusing and training is not obligatory, so as things change over time it helps to know where to go for information. The best place to start is <http://nems.nih.gov/Pages/default.aspx>.

Improvements in signage will also help lessen the confusion of sorting waste. Clarity of messaging builds confidence in recycling that translates to the most difficult places to sort waste—cafeterias and labs.

For basic desk-side recycling of paper and commingled items (non-laboratory plastic, metal and glass containers) you can use what is most convenient—a box or blue bin. Whatever the means, be sure to empty your desk-side collections into common area recycle bins and sort accordingly.

A 2016 study on campus recycling behaviors uncovered confusion about batteries, electronics and food-contaminated items.

To recycle batteries and lightbulbs from the workplace, call Chemical Waste for an appropriate container or a pick-up at (301) 496-4710.

The NIH Property Management Branch (301-496-4247) handles government electronics and accessories through either reuse or recycle. Your property custodial officer (PCO) can arrange this pick-up. If you don’t know who your PCO is, your IC property accountability officer can assist.



At left, clear signage makes it easy for NIH’ers to recycle. At right is a collection of waste disposal guides that have served employees over the years.

Before recycling, items should be as empty as possible and without heavy residue. Food and liquids are considered contaminants in a general recycle bin.

Organic waste such as food and soiled paper (napkins, paper plates and bowls with heavy residue) are compostable. Food packaging and utensils may be compostable. The Division of Amenities and Transportation Services has adopted numerous best practices including the phase-out of Styrofoam products and increased use of compostable plastic ware.

Unfortunately, local compost facility services are not presently available to campus. Until such an opportunity resurfaces, compostable items are being sent to a waste-to-energy facility along with general trash.

Lastly, the *NIH Record* is recyclable as mixed paper. It no longer has to be sorted separately as office white paper.



At left, Lt. Lawrence Brown grills chicken to perfection. At right, Christina Jamison (l) and Mary Rainey serve up lunch for Sgt. James Duke and Maj. Pamela Datcher.

PHOTOS: ERIC BOCK

NIH Observes Police Awareness Day with Barbecue, Demonstrations

The NIH Police hosted the 22nd Police Awareness Day on May 18 in front of Bldg. 1. Officers talked to employees about their jobs, held educational demonstrations and, of course, grilled chicken, hamburgers and Italian sausages with peppers and onions for attendees. Officers from several surrounding law enforcement agencies also attended the event. Police Awareness Day is part of National Police Week, which honors police officers killed in the line of duty.

CSR Mourns Makrides

Dr. Savvas Makrides, a scientific review officer at the Center for Scientific Review, died peacefully at his cousin's home in Newton, Mass., on Mar. 2.

Makrides came to NIH in 2009 and had been an SRO at NCI, NIDCR and CSR. He lived in Gaithersburg and was formerly of Bedford, Mass. He had been diagnosed with esophageal cancer earlier this year.

"Savvas took a great deal of joy and pride in taking on a difficult job at CSR," said Dr. Richard Panniers, chief of CSR's genes, genomes and genetics integrated review group. "He successfully administered highly complex reviews in multiple clusters, including structural biology, biomedical engineering, cell biology and genetics/genomics."

Makrides was born in Paphos, Cyprus, in 1950 and came to the United States as an undergraduate in biology at the University of Minnesota. After completing his Ph.D. in biology at Boston College, he had postdoctoral fellowships at Tufts University Medical School and at Boston University Medical School in biochemistry.

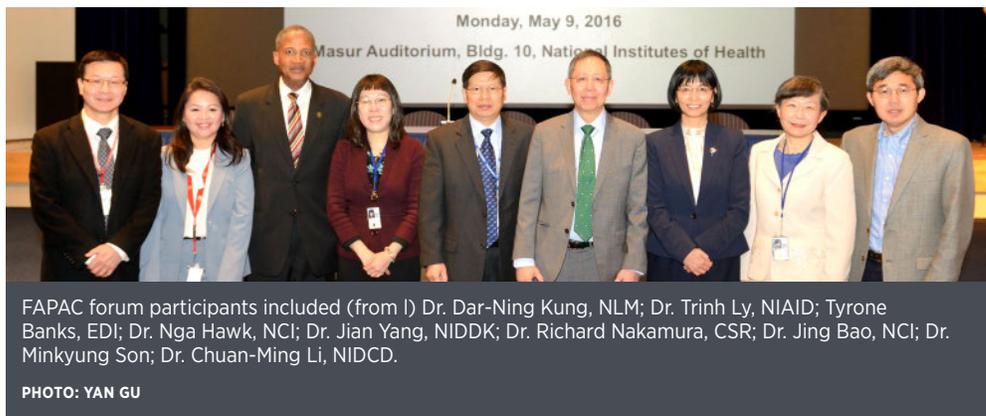
His areas of interest included gene transfer and protein expression in bacterial, insect and mammalian cell systems as well as fluorescent particles for labeling proteins and drug development. He made widely recognized contributions to his field with 19 coauthored original research articles, 7 patents and many scientific reviews and book chapters. After postdoctoral studies, Makrides worked at T-Cell Sciences, EIC Laboratories and several other biotechnology companies prior to joining NIH.

"He loved to laugh, had a wonderful sense of humor and was a loyal friend to many," said Dr. Cliff Schweinfest, a friend and colleague at NCI. He noted that Makrides took a scholarly approach to all of his endeavors and had many interests, both in science and society. He will be remembered for his vigorous discussion of many topics, his love of jazz and classical music as well as his intense interest in gardening.

Survivors include his daughter, Julie Makrides, of Concord, Mass.; his former wife, Joyce Eather, of Brookline, Mass.; sister Elli Savaranos of Dallas, brother Harnos Makrides of Scotland; cousin Alkis Makrides of Newton and his mother, Tasoulla Makrides, of Nicosia, Cyprus.



Dr. Savvas Makrides



FAPAC forum participants included (from l) Dr. Dar-Ning Kung, NLM; Dr. Trinh Ly, NIAID; Tyrone Banks, EDI; Dr. Nga Hawk, NCI; Dr. Jian Yang, NIIDDK; Dr. Richard Nakamura, CSR; Dr. Jing Bao, NCI; Dr. Minkyung Son; Dr. Chuan-Ming Li, NIDCD.

PHOTO: YAN GU

NIH Hosts HHS Asian Pacific Forum

The Federal Asian Pacific American Council (FAPAC) and HHS recently co-sponsored a forum to observe Asian American and Pacific Islander Heritage Month in Masur Auditorium, Bldg. 10.

FAPAC was founded in 1985 as a nonprofit educational organization. One of its goals is to assist the federal and District of Columbia governments in promoting equitable participation of Asian Americans and Pacific Islanders in the federal workforce.

The NIH chapter of FAPAC was established on Jan. 16, 2016. Its mission is to promote representation of AAPIs in the NIH workforce, particularly in grade level GS-15 and above, and promote awareness of AAPI cultures and heritage. New members can join at www.fapac.org/membership.

The forum included Debra Chew, director of NIH's Office of Equity, Diversity and Inclusion, and Dr. Richard Nakamura, director of the Center for Scientific Review.

People with Anxiety Needed

NIMH is studying people with anxiety and how they respond to stressful events. Researchers are seeking those with general anxiety, panic and/or social anxiety disorder. Study requires one to two outpatient visits to the Clinical Center. Compensation will be provided. For more information, call 1-866-444-2214 (TTY 1-866-411-1010) and refer to study 03-M-0093.

Asthma Research Volunteers Sought

Individuals 18 years or older with asthma are sought to participate in a 1- to 2-day research study in the Cardiovascular and Pulmonary Branch at NIH. A thorough medical evaluation and monetary compensation will be provided. If interested, call (301) 402-1553.

NIMH Seeks Healthy Volunteers

NIMH is studying how two commonly prescribed medications affect attention and anxiety while a person is performing computer-based tasks under stress. Researchers are seeking healthy volunteers, 18-50 years old without mental health disorders. Study requires 2 outpatient visits to the Clinical Center. Compensation will be provided. For more information, call (301) 451-5087 or email bari.fuchs@nih.gov. Refer to study 14-M-0114.

Stress Study Looking for Participants

NIMH is studying how the brain and body respond to stressful events. Researchers are seeking healthy volunteers without mental health disorders. Study requires 1-4 outpatient visits to the Clinical Center. Compensation will be provided. For more information, call (301) 451-5087 and refer to study 01-M-0185.

Healthy Older Adults Wanted

Healthy older adults, ages 55-70, are invited to participate in an outpatient research study investigating the benefits of tart cherry and Aroniaberry supplementation on vascular health. The goal of the study is to determine whether the supplements improve blood flow and blood vessel function that can affect your heart. Eligible participants must be medication-free and in good general health. The study will be carried out in an outpatient clinic and includes 7 visits over 3-4 months. Compensation for the study is provided. For more information, call 1-800-411-1222 (TTY 1-866-411-1010) and refer to study 15-NR-0085 or visit www.clinicaltrials.gov.



The scoreboard at Nationals Park captures NIH director Dr. Francis Collins singing the National Anthem on May 24 to celebrate Federal Workforce Day.

NIH Director Sings National Anthem

PHOTOS: DIANE BAKER

NIH director Dr. Francis Collins sang the National Anthem at a baseball game pitting the Washington Nationals against the New York Mets on May 24 to celebrate Federal Workforce Day at Nationals Park. He was joined at the game by the Carroll family. Daughter Addison (“Addi”) is a research volunteer at the Clinical Center. Ryan Whited, family program manager at the Children’s Inn at NIH, also attended.

After his performance reportedly “knocked it out of the ballpark,” Collins greeted fans and signed autographs, as expected of a (science) rock star. The Nationals won the game, 7-4.

View the director’s performance online at https://www.youtube.com/watch?v=nxV7LKx_yQ4.



ABOVE: Before the game gets under way, Collins joins the Carroll family for a few photos.

LEFT: Addi gets the grand tour of the infield and home plate from Nationals mascot Scream.

BELOW: Enjoying the game at Nats Park are (from l) Jeff Wagner, inn liaison for the K’s for Kids program; Ryan Whited, family program manager at the Children’s Inn at NIH; and Collins.

